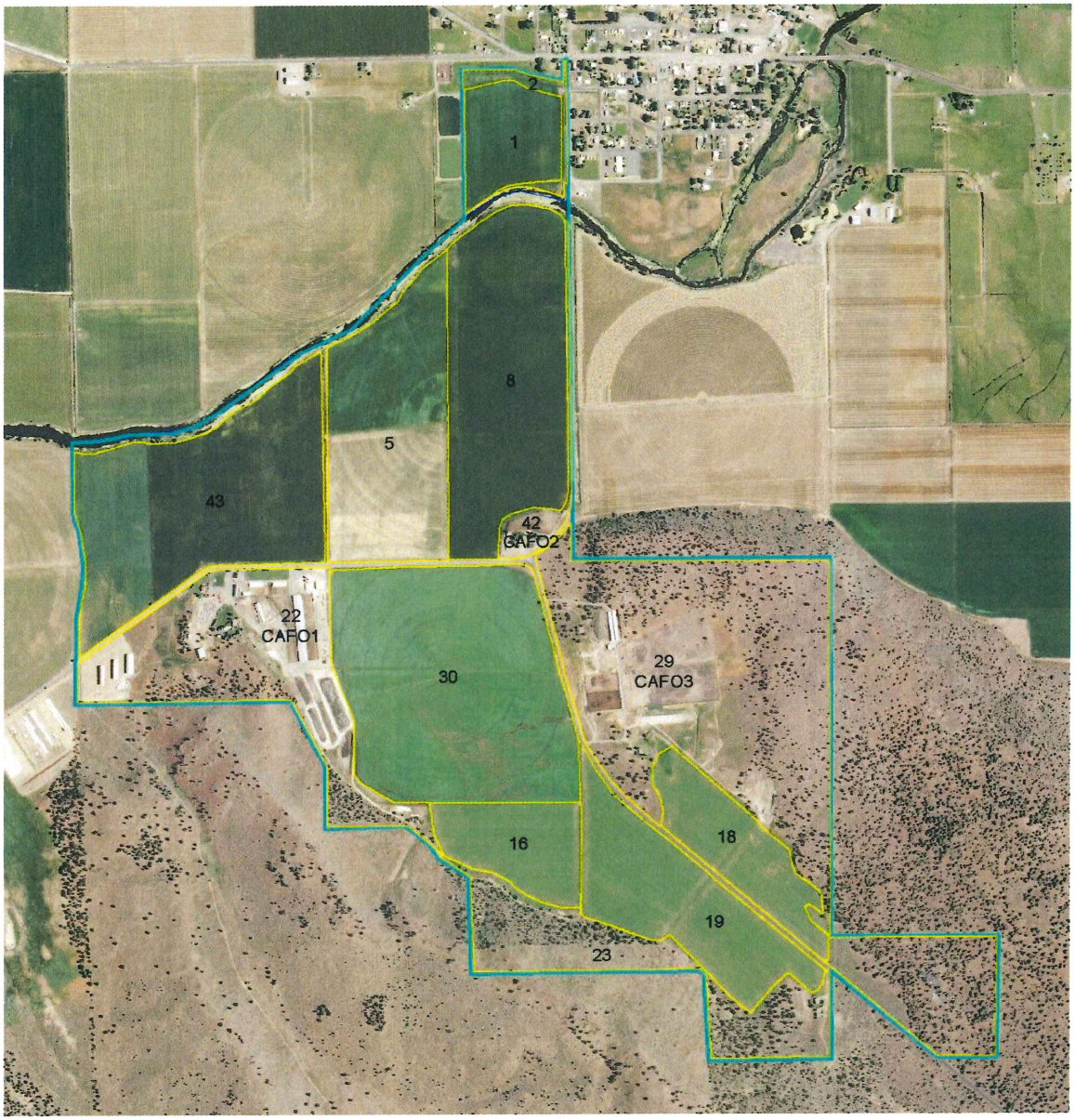
MA No. 62958
Log No. 15009

Animal Waste Management Plan
for
Bonanza View Dairy

c/o Arie and Jenneke DeJong
4721 Harpold Road
Bonanza, OR 97623
(541) 545-6173

RECEIVED
FEB 27 2015
ODA - AREA V



Prepared by:
Bruce D. Wilson
H&R Engineering LLC
Keizer, OR
(866) 493-3243

Bonanza
View
Dairy

2015

Animal Waste Management Plan

Bonanza
View
Dairy

2015

Animal Waste Management Plan

TABLE OF CONTENTS

SECTION 1 – GENERAL INFORMATION

- Signature Page 1-1
- Background and Site Information 1-3
- Manure Storage and Nutrient Balance Summary 1-6
- Emergency Response Plan 1-7
- Farm Location Map 1-8
- Farm Topography Map 1-9

SECTION 2 – PRODUCTION AREA

- Number of Animals 2-1
- Animal Mortality Management 2-1
- Collection of Manure, Process Water and Runoff 2-1
- Treatment Facilities 2-1
- Storage Facilities 2-2
- Transfer of Manure, Process Water and Runoff 2-2
- Operation and Maintenance Considerations 2-3
- Production Area Map(s) 2-9

SECTION 3 – UTILIZATION AREA

- Cropping System 3-1
- Field Map(s) 3-2
- Application 3-3
- General Considerations for Making Manure Applications 3-3
- Considerations for Dry Season Manure Applications 3-4
- Setback Map(s) 3-5
- Considerations for Wet Season Manure Applications 3-6
- Manure Sampling Protocol and Test Results 3-7
- Soil Sampling Protocol and Test Results 3-8
- Amount of Manure to Apply for Crops Grown 3-9
- Irrigation Water Management 3-17

SECTION 4 – SOIL AND RISK ASSESSMENT

- Soil Map(s) 4-1
- Soil Reports 4-3
- Predicted Soil Erosion 4-15
- Phosphorus Index 4-20

SECTION 5 – REFERENCES

- Application for Modification of Animal Numbers 5-1
- Notice of Registration and Oregon CAFO General Permit Summary 5-3
- Oregon Confined Animal Feeding Operation General Permit Number 1 5-5
- Publications and Software 5-27
- ORAWM Workbook 5-29

TABLE OF CONTENTS

GENERAL INFORMATION

Oregon Department of Agriculture **CAFO Division** **Animal Waste Management Plan** **Signature Sheet**	**ODA USE ONLY** MA#_____ AWMP#_____ Approved Date_____ Received Date_____

Facility Name: Bonanza View Dairy

Facility Address: 4721 Harpold Road

Bonanza, OR 97623

Operated by: Arie and Jenneke DeJong

Mailing Address: 4721 Harpold Road

Bonanza, OR 97623

Complete if different than the Operator

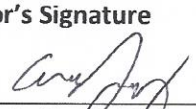
Owned by: Arie and Jenneke DeJong

Mailing Address: 4721 Harpold Road

Bonanza, OR 97623

☒ **As the Operator of** Bonanza View Dairy**, I agree to manage this facility in accordance with the existing Animal Waste Management Plan (AWMP) #_____ on file with ODA and maintain those practices as described in the plan. This signed AWMP is incorporated into the CAFO NPDES General Permit by reference (Permit Condition S3.A.2.).**

☒ **If changes are made to the animal population, facilities and/or management of the CAFO, a new AWMP must be submitted to ODA for approval at least 45 days before the modification is implemented unless a different schedule is allowed by ODA in writing (Permit Condition S3.D.1 and 2).**

Operator's Signature	**Date**
	2-27-2015

Operator's Name (Please Print)

Arie de Jong

GENERAL INFORMATION

GENERAL INFORMATION

BACKGROUND AND SITE INFORMATION

Animal Feeding Operation: Large Concentration CAFO

Type & Size: Dairy- Current: 2,350 Animals
Planned: 4,585 Animals

Latitude/Longitude: N42.1824^0, W121.41821^0

The Bonanza View Dairy is located approximately a 24 miles east of Klamath Falls, Oregon in Klamath County, Oregon near the town of Bonanza. It is located in the southeast region in Oregon at an elevation of approximately 4,100 feet. The annual precipitation varies from 12 to 15 inches of which 70% falls within a 6 month period from November through April and less than 10% falls from June through August. Total average annual snowfall is 15 to 45 inches. Winds are generally moderate from the west with an average annual wind speed of 9 mph. There is approximately 90 to 120 frost free days and the average annual mean temperature is 48 degrees Fahrenheit. Soils vary from deep to moderately deep loam, loamy fine sand, fine sandy loam, and very fine sandy loam that are well to excessively drained.

Bonanza View Dairy is owned and operated by Arie and Jenneke DeJong and consists of three areas totaling 301.1 acres that contain the dairy and livestock housing facilities, and 561.2 acres of hay fields. These areas are shown on the farm Field Map in Section 3.

Bonanza View Dairy is currently permitted to house 2,350 dairy livestock consisting of 936 milk cows, 141 dry cows, 950 heifers and 323 calves. The livestock are confined year-round in freestall barns, loafing barns and open lot areas. Approximately 50% of the heifers are moved to off farm leased grazing fields from mid-April to mid-September. The maximum number of livestock planned for the dairy are 4,585 dairy livestock consisting of 995 milk cows, 300 dry cows, 2,010 heifers and 1,280 calves. A request for a modification of the permitted animals for Bonanza View Dairy is located at the beginning of Section 5.

Any livestock mortality that occurs during the year on the farm are disposed of by natural methods in an area shown on the Field Map in Section 3 that is 2,000 feet from the dairy facilities, 3,000 feet from the nearest residence and 5,000 feet from the nearest waterway.

Wastewater from the dairy operations (CAFO1) is directed to a central below ground reinforced concrete collection tank. Manure, wasted feed and bedding in the freestall barns is collected in the alleyways and flushed to the central collection tank using recycled flush water from the waste storage ponds. Wastewater and rainfall runoff collected in the collection tank is pumped to a series of two earthen settling basins where solids are removed. Solids cleaned from the settling basins and manure, bedding and wasted feed collected in the loafing barns and lot areas are place in piles and dried to be used for bedding. Wastewater from the earthen settling basins drains to two waste storage ponds where it is stored until it is used for flushwater or applied to the hay land

fields as a source of nutrients. Dried solids not used for bedding are applied to the hay land fields or exported off farm and utilized as a source of nutrients and organics. The Production Area Map for the CAFO2 facilities can be found in Section 2 that provides an overview of the dairy facilities and manure management system.

Manure at the CAFO2 facilities shown on the Production Area Map in Section 2 is handled as a dry pack in the barns and corral areas. Any runoff including the 25 year-24 hour storm flows from the CAFO2 facilities to field 8 which acts as a vegetated treatment area. It is estimated that approximately 7.5 acres of vegetated treatment area in field 8 is needed to treat the runoff from CAFO2. The runoff area for CAFO2 is shown on the topography map on page 1-9. Solids containing manure, wasted feed and bedding removed from the barns and corral area is dried and recycled for bedding or applied to the hay land fields or exported off farm and utilized as a source of nutrients and organics.

Manure at the CAFO3 facilities shown on the Production Area Map in Section 2 is handled as a dry pack in the sheds and corral areas. Any runoff including the 25 year-24 hour storm flows from the CAFO3 facilities to field 30 which acts as a vegetated treatment area. It is estimated that approximately 46 acres of vegetated treatment area in field 30 and field 18 is needed to treat the runoff from CAFO3. The runoff area for CAFO3 is shown on the topography map on page 1-9. Solids containing manure, wasted feed and bedding removed from the barns and corral area is dried and recycled for bedding or applied to the hay land fields or exported off farm and utilized as a source of nutrients and organics.

Bonanza View Dairy farms 561.2 acres of irrigated hay land to raise feed for the dairy livestock. The hay land fields are planted to various forage crops that are harvested as haylage and put into bags for storage. The cropping system consists of alfalfa, barley, oats, peas, triticale and wheat which are rotated in the fields annually. Some of the solids cleaned from the corral areas is stock piled in the hay land fields prior to application. Areas where solids are stock piled in the hay land fields vary from year to year so any residual nutrients from the stock piles are utilized by the crops being grown. Solids and wastewater contain manure are applied using a solids spreader, an airway injection system and sprinkler irrigation systems operated by employees of Bonanza View Dairy and Arie and Jenneke DeJong. All of the wastewater produced will be applied to the hay land fields but some of the solids may be transferred between the Bonanza View Dairy and Windy Ridge Dairy owned by Arie and Jenneke DeJong or exported to other farms to maintain an agronomic balance of applied nutrients from manure applications. Wastewater and solids applications will not be made to areas outside of the facilities in the CAFO1, CAFO2 and CAFO3 fields except for dried solids being used in garden areas and flower beds as these areas are range land. No applications of wastewater or solids will be made to field 23 as it is also range land.

GENERAL INFORMATION

The soil concentration of phosphorus is medium to high in the hay land fields. The phosphorus index ratings are currently low to medium in all fields. The phosphorus index ratings are projected to stay low or medium for all fields if solid manure and waste water are applied on a nitrogen basis and solids containing manure continue to be exported. Supplemental nutrient applications to the hay land fields should be based on soil tests and Oregon State Extension fertilizer guides to prevent excessive soil nutrient concentrations.

GENERAL INFORMATION

MANURE STORAGE AND NUTRIENT BALANCE SUMMARY

Manure Storage-

Storage Type:	Capacity	Estimated Storage Period
Wastewater Storage Pond-	44.85 AF	142 Days
CAFO1 Solids Storage-	243,702 CF	>365 Days
CAFO2&3 Solids Storage-	1,491,696 CF	>365 Days

Nutrient Balance-

Nutrients Generated:	N Generated (lbs) after Losses	P_2O_5 Generated (lbs) after Losses
Solid Manure-	221,090 lbs	244,631 lbs
Liquid Manure-	15,485 lbs	30,477 lbs
Total-	**236,575 lbs**	**275,108 lbs**

Exported Nutrients:	N Exported (lbs) after Losses	P_2O_5 Exported (lbs) after Losses
Solid Manure-	0 lbs	0 lbs
Liquid Manure-	0 lbs	0 lbs
Total-	**0 lbs**	**0 lbs**

Crop Nutrient Removal:	N Utilized (lbs)	P_2O_5 Utilized (lbs)
Total-	**264,053 lbs**	**70,616 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)-	236,575 lbs	264,053 lbs	-27,478 lbs
Phosphate (P_2O_5)-	275,108 lbs	70,616 lbs	204,492 lbs

System Losses:	Nutrients Generated (lbs)	Nutrients Remaining after Losses (lbs)	Nutrients Lost in System (lbs)
Nitrogen (N)-	419,884 lbs	236,575 lbs	183,309 lbs
Phosphate (P_2O_5)-	303,894 lbs	275,108 lbs	28,785 lbs

GENERAL INFORMATION

EMERGENCY RESPONSE PLAN

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

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. 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:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

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

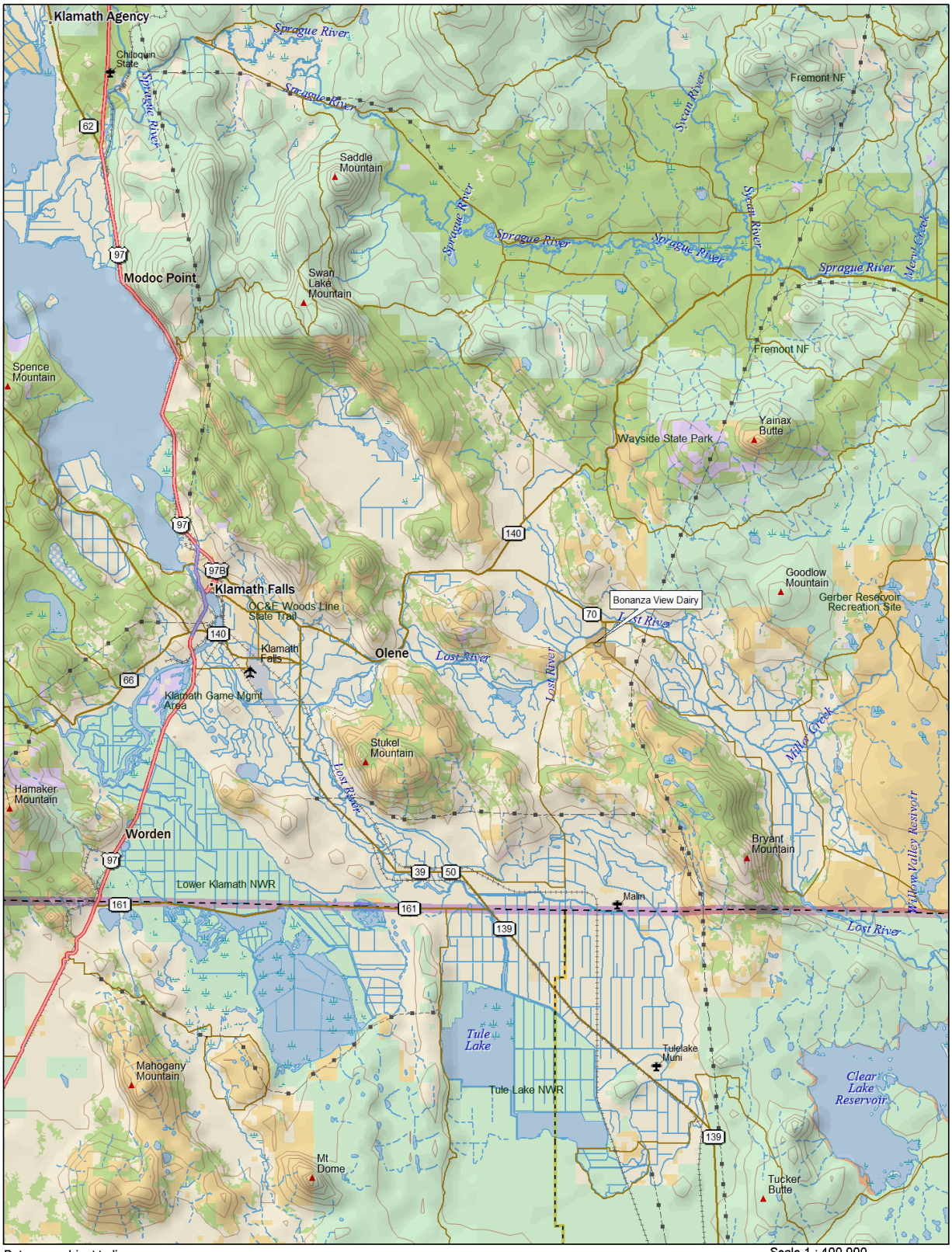
Organization	Phone Number
Oregon Dept. of Agriculture Natural Resources Division 635 Capitol St., N.E. Salem, OR 97301-2532	(503) 986-4700 TTD (503) 986-4762
Oregon Emergency Response (System OERS)	(800) 452-0311
County Environmental Health Department	(541) 883-1122
County Roads Department	(541) 883-4585

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

GENERAL INFORMATION

LOCATION MAP FOR BONANZA VIEW DAIRY



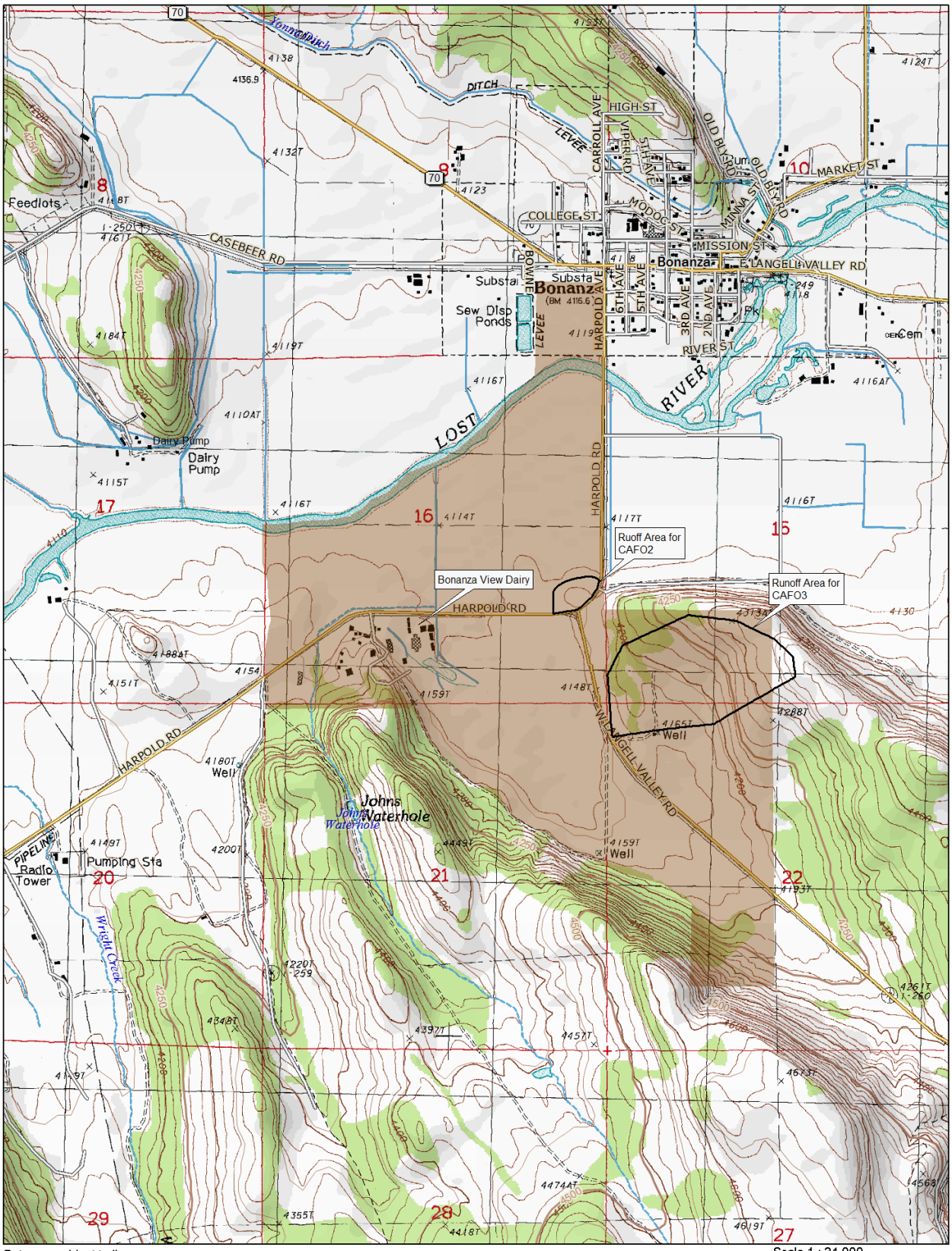
Data use subject to license.
© DeLorme. Topo North America™ 9.
www.delorme.com

TN
MN (14.8°E)

Scale 1 : 400,000
1" = 6.31 mi
Data Zoom 9-0

GENERAL INFORMATION

TOPOGRAPHY MAP FOR BONANZA VIEW DAIRY



Data use subject to license.

© DeLorme. Topo North America™ 10.

www.delorme.com

TN

MN (14.7°E)

Scale 1 : 24,000

1" = 2,000.0 ft

Data Zoom 13-0

GENERAL INFORMATION

PRODUCTION AREA

ANIMAL NUMBERS

Bonanza View Dairy is planning to milk 995 cows on this dairy. The number of replacement livestock planned to be cared for on Bonanza View Dairy consists of 300 dry cows, 2,010 heifers and 1,280 calves. This plan is based on a total of 4,585 dairy animals and the land base described in this plan.

ANIMAL MORTALITY MANAGEMENT

Currently animal mortalities for the Bonanza View Dairy are being disposed of by natural methods in an area shown on the Field Map in Section 3 that is 2,000 feet from the dairy facilities, 3,000 feet from the nearest residence and 5,000 feet from the nearest waterway. Other methods of dealing with mortalities may be employed by Bonanza View Dairy as needed.

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.

COLLECTION OF MANURE, PROCESS WATER AND RUNOFF

Manure, bedding and wasted feed is collected in the barns. The estimated volume of Manure bedding and wasted feed that will be collected annually was generated using the ORAWM workbook located in Section 5.

Flushwater used to clean the alleyways in the barns is directed to catch basins that drain to the wastewater collection tank via underground pipelines. Flushwater is recycled from the wastewater storage ponds during the wet season storage period so there is no additional fresh water added.

Leachate and rainfall runoff from the silage and solids storage areas is directed to catch basins that drain to wastewater collection tank via underground pipelines. The estimated volumes of leachate and rainfall runoff from the silage and solid storage areas that will be collected annually were generated using the ORAWM workbook located in Section 5.

Rainfall runoff from paved and unpaved areas that comes into contact with animal manure is directed to catch basins that drain to the wastewater collection tank. The estimated volume of rainfall runoff that will be collected annually was generated using the ORAWM workbook located in in Section 5.

All process water from the animal feeding operation is directed to catch basins that drain to wastewater collection tank. The estimated volume of process water that will be collected annually was generated using the ORAWM workbook located in Section 5.

PRODUCTION AREA

TREATMENT FACILITIES

Separated solids containing manure are dried and recycled for bedding. Vegetated treatment areas are used to treat rainfall runoff from the CAFO2 and CAFO3 livestock facilities.

STORAGE FACILITIES

The underground reinforced concrete collection tank shown on the Production Area Map on page 2-9 is use to collect wastewater containing manure. This facility is considered a collection and temporary storage facilities only and its capacity was not included in the long term storage calculations.

Capacities and estimate volumes to store for the waste storage facilities can be found on the storage worksheet in the ORAWM workbook located in Section 5.

TRANSFER OF MANURE, PROCESS WATER AND RUNOFF

Wastewater, manure, bedding and wasted feed from the livestock barns is directed to the central collection tank where it is pumped to the settling basins where solids are separated from the wastewater. Wastewater from the settling basins is directed to the wastewater storage ponds and separated solids are transferred to the solids storage areas shown on the Production Area Map on page 2-9.

Wastewater stored in the wastewater storage ponds is pumped to the hay land fields using underground pipelines to be utilized as a source of nutrients. Tank wagons and sprinkler irrigation systems are used to apply the wastewater to the hay land fields.

Solids stored in the solids storage areas are dried and recycled for bedding or hauled to the hay land fields and applied using a solids spreader to be utilized as a source of nutrients. Some solids cleaned from the corral areas may be stock piled in the hay land fields prior to application or exported off farm.

PRODUCTION AREA

OPERATION AND MAINTENANCE CONSIDERATIONS

WASTEWATER COLLECTION TANK-

The wastewater collection tank shown on the Production Area Map on page 2-9 is used to collect and temporarily store wastewater containing manure generated by the Bonanza View Dairy. Any annual buildup of solids in the wastewater collection tank must be removed to maintain design capacity and applied to land application areas in accordance with guidance given in Section 3, Utilization Area.

Inspect all tanks weekly to insure structural integrity. If the structural integrity of a tank is compromised, immediately empty the tank to determine the cause and make necessary repairs before putting the tank back into service. Do not allow equipment that exceeds the design limit of the tanks on or within 20 feet of the structure.

Keep pumps, agitators, piping, valves and all other electrical and mechanical equipment in good condition by following the manufacturer's recommendations. Maintain grounding rods and wiring for all electrical equipment in good condition. Immediately remove all foreign debris within the structure that may cause damage to pumps or agitators.

Pump the wastewater collection tank completely empty during the summer months and cleanout any debris and other solid materials that may have accumulated in the tank. Inspect the tank for structural damage and if structural damage to a tank is discovered seek the services of a qualified engineer to assess the damage and recommend necessary repairs before putting the tank back into service. Follow the guidance given in Section 3, Utilization Area, when applying wastewater to fields.

Do not dispose of animal carcasses in any wastewater collection tank. It is against the law to do so.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances. Maintain lids, grates and shields on openings.

Provide proper ventilation before entering the tank, for any reason what so ever. Provide and use self - contained breathing apparatus (scuba) equipment when entering a tank. No persons should enter the tank unless safety ropes are used and someone else capable of providing rescue assistance is outside the tank.

Do not assume any tank, including open top tanks, are well ventilated.

SETTLING BASINS-

Inspect the settling basins daily to ensure there is adequate capacity for separated solids and the basins are operating properly and there has been no damage to structural components. Clean screens and outlets if they have become clogged or their capacity is not adequate for proper operation of the facility.

During daily inspections if it is determined that the maximum capacity of the settling basin has been reached, remove accumulated solids from the basin and store them in the solids storage area or haul them to the application area for utilization. When removing solids from earthen basins take care not to disturb the earthen liner.

PRODUCTION AREA

Prevent any spillage or leakage onto roadways when transferring solids from the settling basins to the solids storage areas and to utilization areas.

Do not dispose of animal carcasses in any settling basin. It is against the law to do so.

WASTEWATER STORAGE PONDS-

The wastewater storage ponds shown on the Production Area Map on page 2-9 are used to store wastewater containing manure generated by the Bonanza View Dairy. The storage capacity and estimated storage period for the wastewater storage ponds are shown on the ORAWM workbook storage worksheet located in Section 5.

Emptying of the wastewater storage ponds should begin in the spring and continue through the spring and summer months as weather conditions permit applying wastewater in accordance with the guidance given in Section 3, Utilization Area. To function properly and have the greatest management flexibility, the wastewater storage ponds must be as empty as possible in the fall before the fall and winter rainy season begins. Any annual sludge buildup in the wastewater storage ponds must be removed to maintain design capacity and applied to land application areas in accordance with guidance given in Section 3, Utilization Area.

Inspect the wastewater storage ponds 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 embankment. If the structural integrity of a wastewater storage pond 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.

Pump the wastewater storage ponds to the lowest level possible during the summer months and inspect the embankments for structural damage. If structural damage to the embankment of a wastewater storage pond 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, Utilization Area, when applying wastewater to fields.

Do not permit livestock access to the wastewater storage pond or on the embankments. Control undesirable vegetation growth by spraying or mowing. Control rodents as necessary. Check elevations of earthfills periodically and restored 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 settling basin or wastewater storage pond. It is against the law to do so.

SOLIDS STORAGE FACILITY-

The lot and corral areas shown on the Production Area Maps starting on page 2-9 are used to store solids containing manure generated by the Bonanza View Dairy. The storage capacity and estimated storage period for the solids storage areas are shown on the ORAWM workbook storage worksheet located in Section 5. Emptying of the solids storage facility should begin in the spring and continue through the spring and

summer months as weather conditions permit applying solids in accordance with the guidance given in Section 3, Utilization Area. To function properly and have the greatest management flexibility, the solids storage facility must be as empty as possible in the fall before the fall and winter rainy season begins.

Periodically inspect concrete and asphalt slabs, walls and curbs and repair or replace broken sections as needed. Cleanup any spillage of manure and organics from outside of the solids storage area and place them back in the solids storage facility.

Maintain all fences, railings, and/or warning signs to provide warning and/or prevent unauthorized human or livestock entry. Immediately repair vandalism, vehicular or livestock damage to the structure, earthen areas surrounding the structure, or any appurtenances.

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.

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.

PRODUCTION AREA

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.

IRRIGATION SYSTEMS-

Maintain sprinkler 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.

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.

PRODUCTION AREA

PIPELINES-

Flush pipelines used for liquid waste applications with clean water following waste application, or as needed, to prevent particle buildup.

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.

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.

PRODUCTION AREA

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.

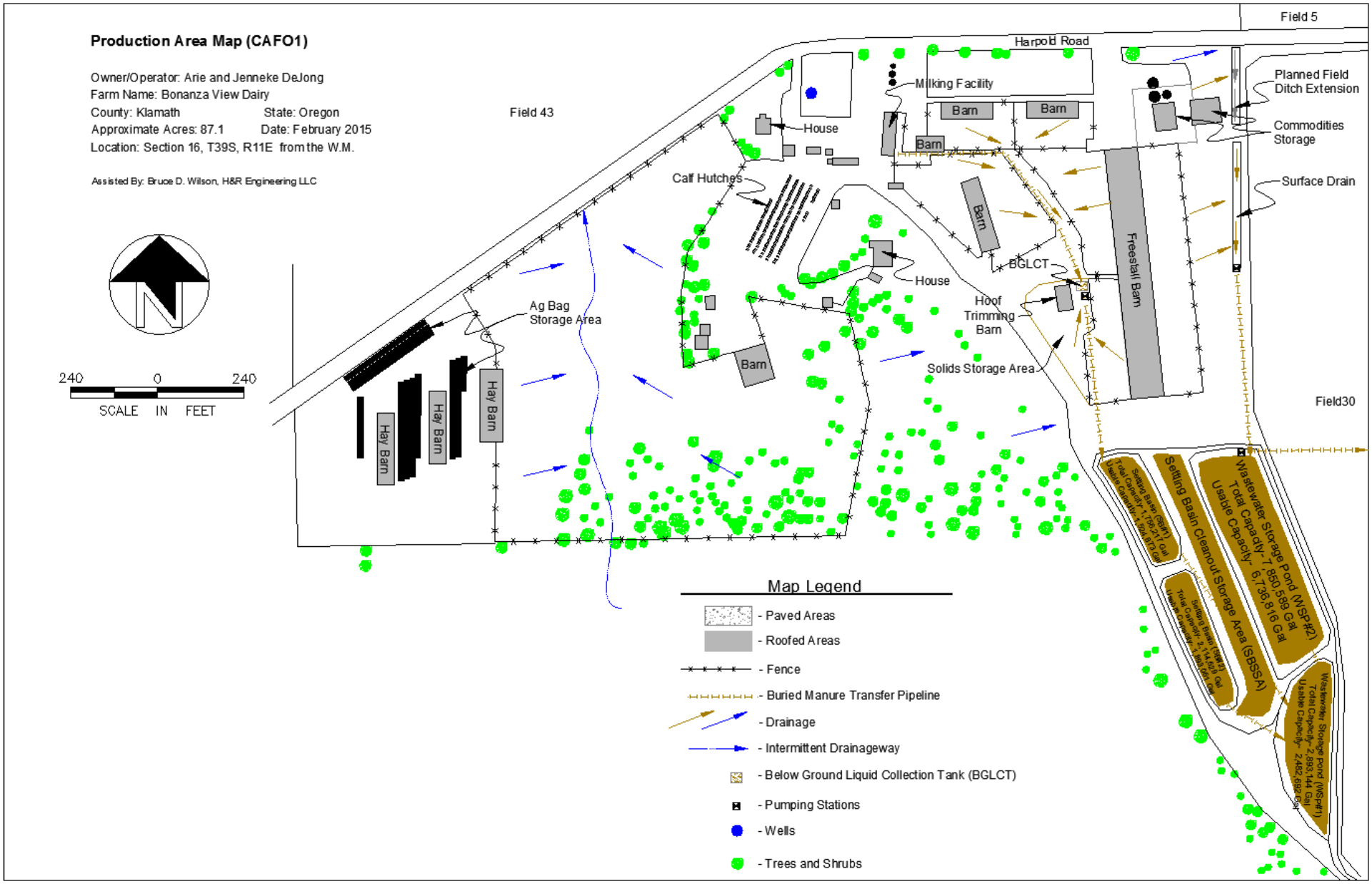
CHEMICAL HANDLING CHECKLIST-

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.

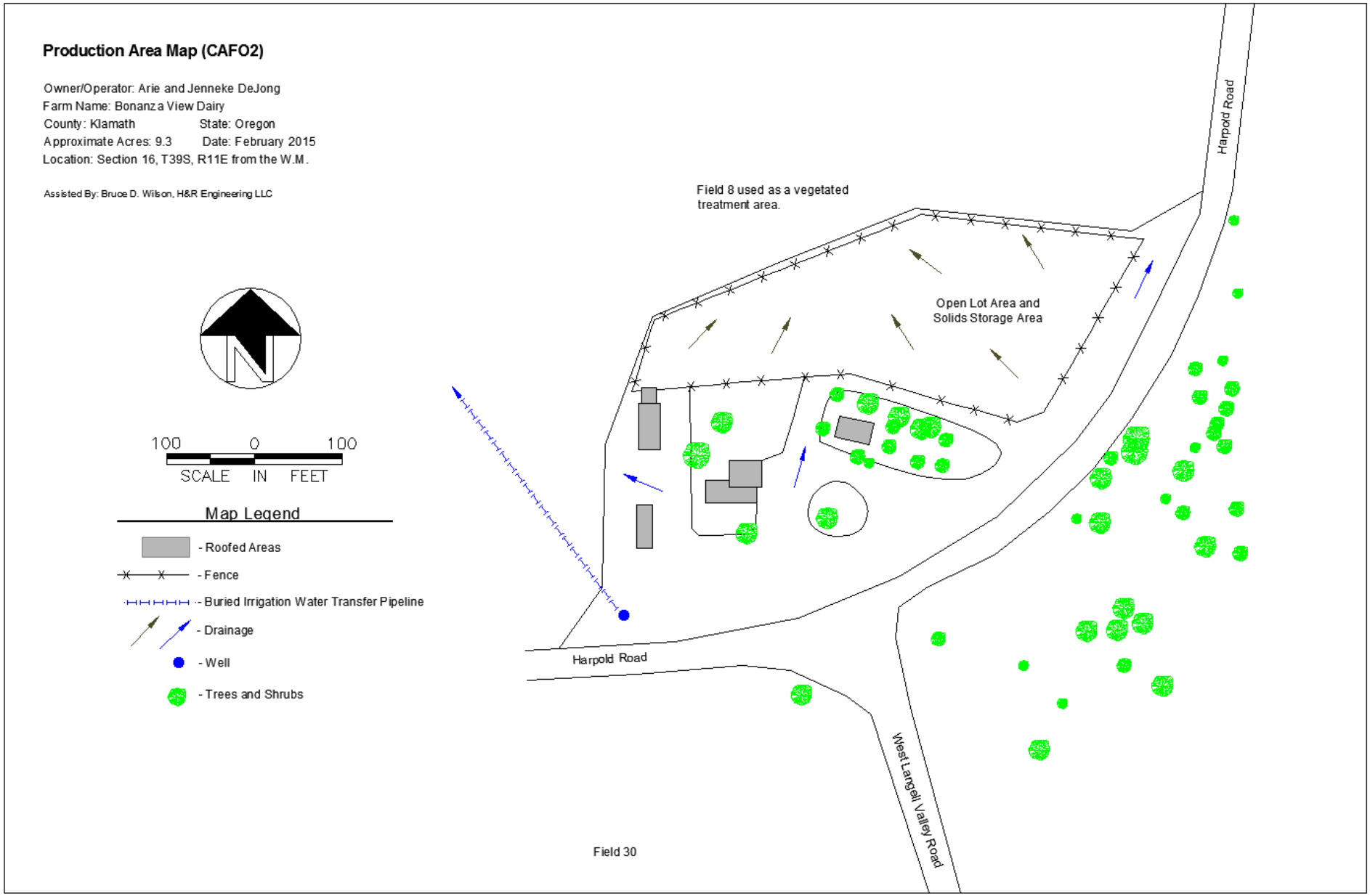
PRODUCTION AREA

PRODUCTION AREA MAP FOR BONANZA VIEW DAIRY



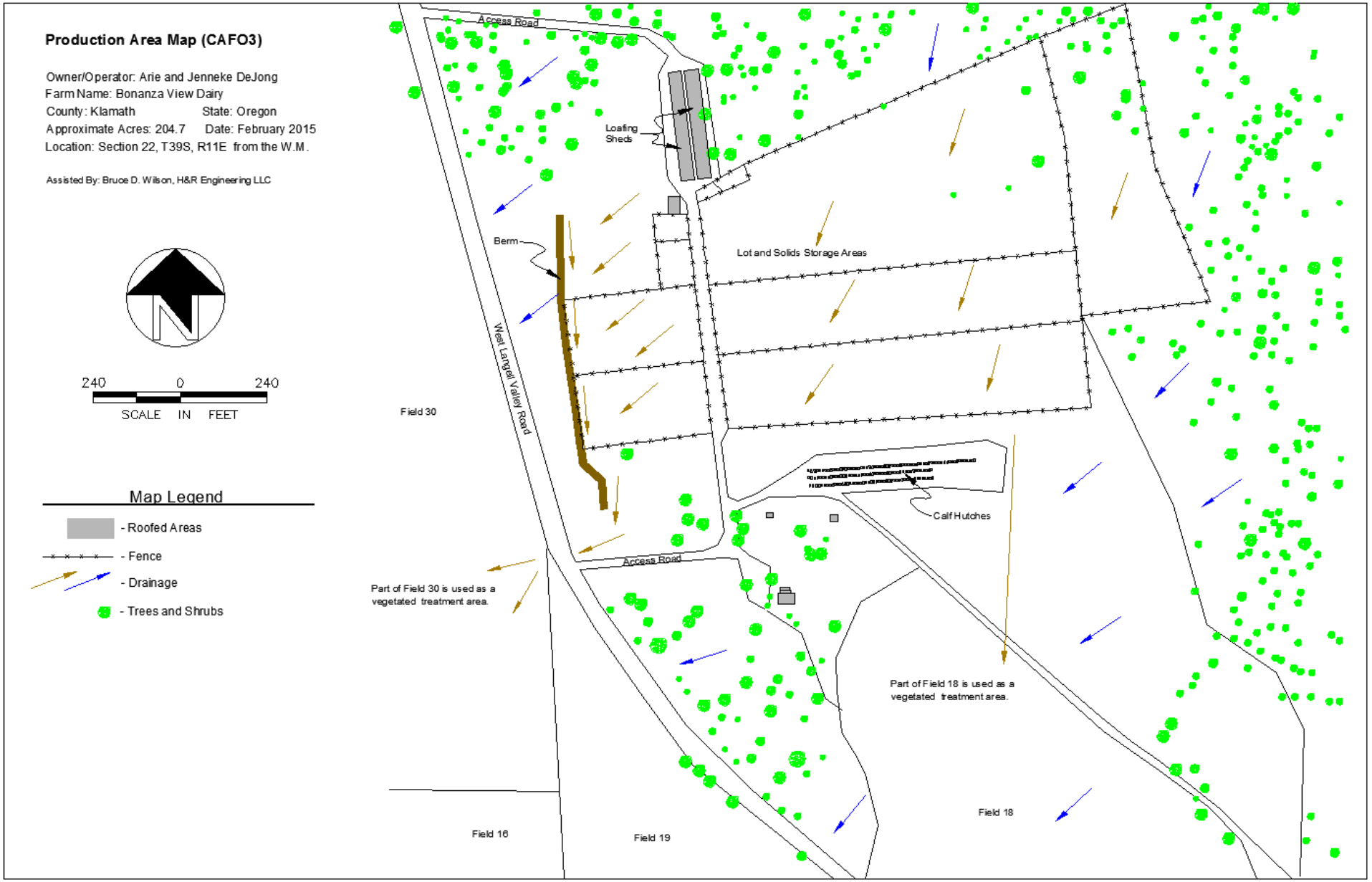
PRODUCTION AREA

PRODUCTION AREA MAP FOR BONANZA VIEW DAIRY



PRODUCTION AREA

PRODUCTION AREA MAP FOR BONANZA VIEW DAIRY



PRODUCTION AREA

UTILIZATION AREA

CROPPING SYSTEM

The acres of crop land area available for utilization of the nutrients and organics contained in the wastewater and solids produced from the Bonanza View Dairy is shown on the utilization worksheet in ORAWM located in Section 5. Yield data and nutrient utilization rates for the crops grown are also shown on the inventory worksheet in ORAWM located in Section 5.

Irrigated and nonirrigated crop yield data from the Klamath County Soil Survey referenced in Section 5 indicates the yield data used in developing this plan is within the range of the given crop yields for well managed fields.

A tank wagon and sprinkler systems are used to apply wastewater from the wastewater storage ponds to reduce application losses. These systems apply wastewater at a constant rate so they must be calibrated to insure nutrients are not over applied.

Side roll (wheeline) irrigation systems are used to irrigate the crop land fields for Bonanza View Dairy. These systems use single boom with sprinkler nozzles mounted above the boom and apply water depending on the nozzle size, operating pressure and set time used with an efficiency of 65 to 75 percent. Side roll sprinkler systems must be well managed to prevent excess percolation, surface runoff and erosion, wind drift and evaporation losses.

A center pivot irrigation system is also used to irrigate the crop land fields for Bonanza View Dairy. These systems use single boom with sprinkler nozzles mounted below the boom and apply water depending on the nozzle size, operating pressure and travel speed used with an efficiency of 80 to 90 percent. Center pivot sprinkler systems must be well managed to prevent excess percolation, surface runoff and erosion, wind drift and evaporation losses.

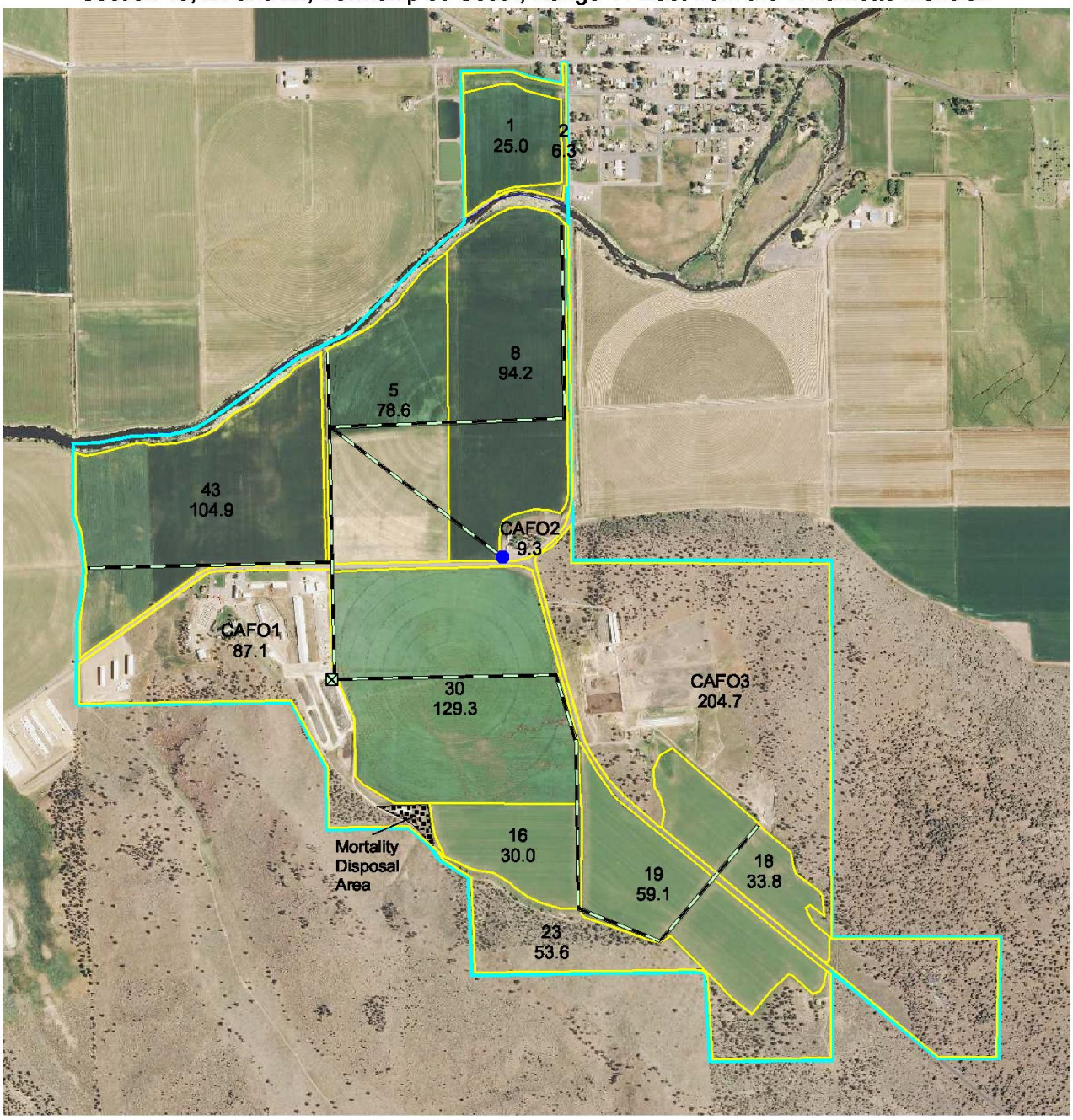
The amount of irrigation water to apply based on the net irrigation requirement of the crop being grown can be found in the tables starting on page 3-19.

UTILIZATION AREA

FIELD MAP(S)

Bonanza View Dairy

Section 16, 21 and 22, Township 39 South, Range 11 East from the Willamette Meridian



UTILIZATION AREA

APPLICATION

The manure and irrigation application systems will be calibrated in accordance with guidance starting on page 3-3 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 setback areas shown on the Setback Map on page 3-5. Applications of wastewater and solids containing manure should be made in accordance with guidance starting on page 3-3 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 Eastern Oregon Phosphorus Index and is shown in the table on page 4-20. Wastewater, solids and commercial fertilizer for any field with a high runoff rating must be applied on a phosphorus basis. Wastewater, solids and commercial fertilizer for any field with a low or medium runoff rating can be applied on a nitrogen basis. No applications manure or commercial fertilizer containing phosphorus are to be made on a field with a very high phosphorus runoff rating.

GENERAL CONSIDERATIONS FOR MAKING MANURE APPLICATIONS

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.

- **Manure applications may be done** as long as you can comply with all permit conditions and can meet the conditions outlined on page 3-4 to 3-6 in the AWMP. 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 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 starting on page 3-4. Refer to page 3-9 for guidance on the calibration of application equipment.

UTILIZATION AREA

- **Maintain setbacks for manure application from any surface waters.** The management goal is to allow no manure to enter surface waters at any time. The following table shows minimum setback requirements for manure applications:

Manure type	Application Equipment	Season	
		Wet Season	Dry Season
Wastewater	Sprinkler Systems	100 feet	35 feet
Wastewater	Tank Wagon	70 feet	20 feet
Solids	Spreader	70 feet	20 feet

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.

- **Record applications, transfers or exports of nutrients (manure and fertilizer)** and maintain them for at least 5 years. The CAFO Recordkeeping Calendar or the tools and forms referenced in Section 5 may be used to record this information.

CONSIDERATIONS FOR SPRING AND SUMMER MANURE APPLICATIONS:

Apply wastewater and solids containing manure at **agronomic rates** shown on the table on page 3-9 using the following guidelines:

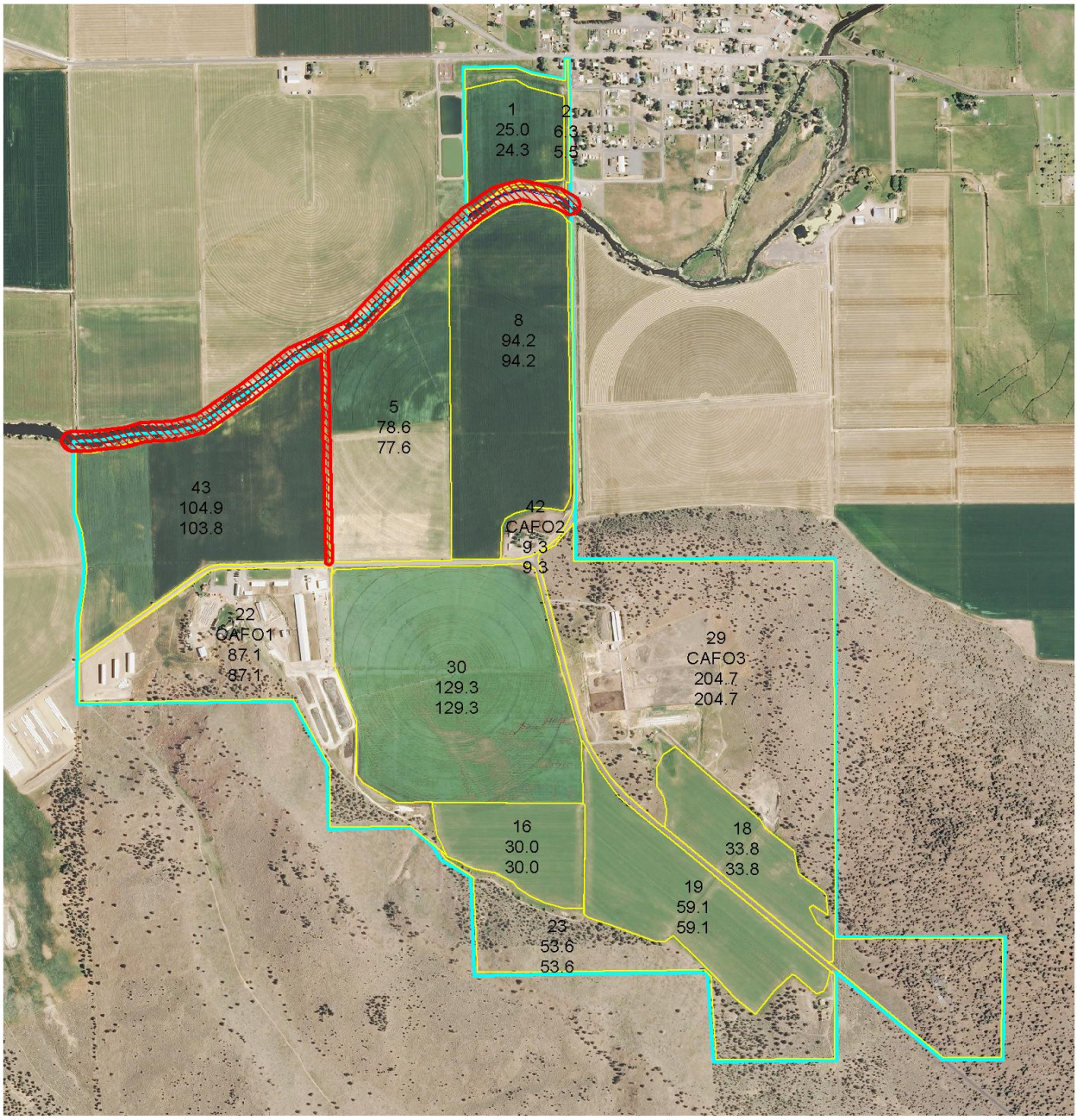
- Apply to land being prepared for crops. Till manure into soil within 3 days of application if possible or apply to actively growing crops such as grass, clover or alfalfa after cutting.
- ***Do not apply*** during rainfall events that are expected to result in saturated soils or surface runoff.
- ***Maintain the setback buffer distances*** described on this page and shown on the Setback Map on page 3-5 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 the tools and forms referenced in Section 5 may be used to record this information.

UTILIZATION AREA

SETBACK MAP(S) FOR BONANZA VIEW DAIRY

Bonanza View Dairy

Setback Map



UTILIZATION AREA

CONSIDERATIONS FOR LATE FALL AND WINTER 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 the table on page 3-4 and shown on the Setback Map on page 3-5 when making applications of liquids or solids containing manure.
- ***Do not apply*** 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 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 the tools and forms referenced in Section 5 may 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.

UTILIZATION AREA

MANURE SAMPLING PROTOCOL

Solid and liquid manure samples are taken and analyzed annually for Bonanza View Dairy by a consultant trained in how to obtain and preserve solid and liquid manure samples for testing. Results of these analysis will be used to determine application rates for manure, litter, and process wastewater. Manure analyses should be performed by a laboratory that meets the requirements and performance standards of the Manure Testing Laboratory Certification Program (MTLCP), http://www.mda.state.mn.us/licensing/pestfert/manurelabs.htm.

MANURE TESTS

Manure Nutrient Analyses

Bonanza View Dairy **LIQUID MANURE ANALYSIS**

Testing performed by A&L Western Agricultural Laboratories, Modesto, California

Report	Date	Sample I.D.	Lbs/1,000 gallons				%	%
			Total N	P_2O_5	K_2O	NH_4-N	Moisture	Solids
2014								
26176	04/04/2014	Wastewater	0.83	1.67	2.00	NA	99.55	0.45

Bonanza View Dairy **SOLID MANURE ANALYSIS**

Testing performed by A&L Western Agricultural Laboratories, Modesto, California

Report	Date	Sample I.D.	Lbs/Ton				%	%
			Total N	P_2O_5	K_2O	NH_4-N	Moisture	Solids
2014								
26175	04/04/2014	Solids Stack	14.60	15.60	45.80	NA	35.88	64.12

UTILIZATION AREA

SOIL TESTING PROTOCOL

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 samples are samples are taken and analyzed for Bonanza View Dairy by a consultant trained in how to obtain and preserve soil samples for testing. Soil analysis must be performed by laboratories successfully meeting the requirements and performance standards of the North American Proficiency Testing Program-Performance Assessment Program (PAP); http://www.naptprogram.org/pap/.

SOIL TESTS

Bonanza View Dairy **SOIL TEST ANALYSIS**

Testing performed by Western Laboratories, Parma, Idaho

Lab Number	Test Date	Field	Depth	NO3-N ppm	NH4-N ppm	P ppm	K ppm	Ca ppm	Mg meq	TB meq	pH	SMP	OM %
2010													
5407	05/07/2010	1	12"	10	8	23	NA	NA	NA	NA	NA	NA	NA

Testing performed by Western Laboratories, Parma, Idaho

Lab Number	Test Date	Field	Depth	NO3-N ppm	NH4-N ppm	P ppm	K ppm	Ca ppm	Mg meq	TB meq	pH	SMP	OM %
2013													
39464	05/03/2013	5	12"	16	6	13	1775	NA	NA	NA	8.2	NA	NA
39462	05/03/2013	8	12”	16	6	53	600	NA	NA	NA	7.9	NA	NA

Testing performed by A&L Western Agricultural Laboratories, Modesto, California

Lab Number	Test Date	Field	Depth	NO3-N ppm	NH4-N ppm	P ppm	K ppm	Ca ppm	Mg meq	TB meq	pH	SMP	OM %
2014													
51480	04/03/2014	16	12"	18	NA	35	429	1859	600	NA	6.7	7.3	2.9
51481	04/03/2014	18	12"	17	NA	54	470	1830	663	NA	6.7	7.1	3.3
51482	04/03/2014	19	12"	16	NA	54	594	1775	662	NA	6.7	7.3	2.9
51483	04/03/2014	30	12"	13	NA	56	520	2214	890	NA	6.9	7.1	3.2
51484	04/03/2014	43	12"	25	NA	76	618	3495	1087	NA	7.1	7.0	5.0

UTILIZATION AREA

AMOUNT OF MANURE TO APPLY FOR CROPS GROWN

The timing and frequency of applications of wastewater and solids containing manure for utilization by crops shown in the table below are based on information provided in Oregon State University Extension publications listed in Section 5.

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 percent (%) dry matter (DM) of harvested crop/100 X planned or measured yield per yield unit

Total P_2O_5 to apply in pounds = P in pounds per yield unit from the table for the crop grown X 2.291 P_2O_5/P X percent (%) dry matter (DM) of harvested crop/100 X planned or measured yield per yield unit

Total K_2O to apply in pounds = K in pounds per yield unit from the table for the crop grown X 1.205 K_2O/K X percent (%) dry matter (DM) of harvested crop/100 X planned or measured yield per yield unit

The following table shows the crops that may be grown on this farm:

				Nutrient Removal (lb/yield unit)		
FRUIT OR VEGETABLES	**Yield Unit**	**lb/Unit**	**% DM**	**N**	**P**	**K**
Beans, dry edible	cwt	100	100	3.13	0.45	0.85
Caneberries	ton	2000	100	11.43	7.42	11.43
Corn, Sweet	ton	2000	100	17.80	4.8	11.6
Mixed Vegetables & Fruit	ton	2000	100	8.33	2.08	10.20
Onions	cwt	100	100	0.30	0.06	0..22
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	6.60	1.20	10.33

UTILIZATION AREA

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
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	10.03	1.08	8.33
Fescue, seed (Fine or Tall)	lb	1	100	0.02	0.00	0.00
Grass Seed	cwt	100	100	1.60	0.20	0.40
Grass Seed, Straw Removed	ton	2000	100	33.90	5.50	34.40
Oats, grain	bushels	32	100	0.62	0.11	0.16
Orchardgrass seed	lb	1	100	0.016	0.002	0.004
Pumpkins	ton	2000	100	4.00	1.40	6.60
Red Clover seed	lb	1	100	0.05	0.01	0.02
Ryegrass Seed	cwt	100	100	1.60	0.20	0.40
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, Soft White Straw Removed	ton	2000	100	83.40	17.10	37.10

UTILIZATION AREA

HAY AND PASTURE CROPS	Yield Unit	lb/Unit	% DM	Nutrient Removal (lb/yield unit) N	P	K
Alfalfa, Hay	ton	2000	100	64.00	8.00	42.00
Alta Fescue Hay/Pasture	ton	2000	100	33.00	6.90	37.60
Grass Legume Hay/Pasture	ton	2000	100	33.90	5.50	34.40
Meadow Fescue Hay/Pasture	ton	2000	100	41.60	8.80	47.40
Oats Hay/Pasture	ton	2000	100	60.00	10.20	14.80
Orchardgrass Hay/Pasture	ton	2000	100	53.20	8.60	18.60
Perennial Hay/Pasture (Low Intensity)	ton	2000	100	32.00	6.00	38.00
Perennial Hay/Pasture (Low-Med Intensity)	ton	2000	100	38.00	6.00	38.00
Perennial Hay/Pasture (Medium Intensity)	ton	2000	100	48.00	7.00	38.00
Perennial Hay/Pasture (Med- High Intensity)	ton	2000	100	58.00	8.00	40.00
Perennial Hay/Pasture (High Intensity)	ton	2000	100	64.00	8.00	40.00
Ryegrass Hay	ton	2000	100	33.40	5.40	28.40
Ryegrass, Perennial Pasture	ton	2000	100	58.00	8.00	48.00
Tall Fescue Hay/Pasture	ton	2000	100	39.40	4.00	40.00

SILAGE AND HAYLAGE CROPS	Yield Unit	lb/Unit	% DM	Nutrient Removal (lb/yield unit) N	P	K
Corn for Silage	ton	2000	100	25.00	4.00	20.00
Crimson Clover forage	ton	2000	100	40.00	4.41	32.98
Field Pea, Forage	ton	2000	100	73.60	8.00	18.00
Oat haylage	ton	2000	100	60.00	10.20	14.80
Oats & Peas/ Green Beans	ton	2000	100	32.03	5.58	18.65
Red Clover forage	ton	2000	100	40.00	4.41	32.98
Ryegrass Haylage	ton	2000	100	50.00	8.00	42.67
Sorghum-Sudan Haylage	ton	2000	100	54.33	6.33	58.00
Triticale Haylage	ton	2000	100	49.00	6.80	11.40
Wheatgrass Hay/Pasture	ton	2000	100	28.40	5.40	53.60

UTILIZATION AREA

				Nutrient Removal (lb/yield unit)		
OTHER CROPS	**Yield Unit**	**lb/Unit**	**% DM**	**N**	**P**	**K**
Hops, Cones	bale	200	100	9.00	0.96	5.00
Natural Area (Trees and Grass)	ton	2000	100	10.52	1.56	9.20
Nursery Stock	ton	2000	100	8.33	2.08	10.20

UTILIZATION AREA

SOLID MANURE APPLICATION CHART

Test Date: 04/04/14
Source: Solids Pile

MANURE ANALYSIS
(As received lb/ton)

Total N	P_2O_5	K_2O
14.60	15.60	45.80

Manure Nutrient Content

Manure Applied	Thickness to apply	Total N	P_2O_5	K_2O
(Tons/Ac)	(inches/Ac)	(lb/A)	(lb/A)	(lb/A)
1.00	0.013	15	16	46
1.50	0.020	22	23	69
2.00	0.026	29	31	92
2.50	0.033	37	39	115
3.00	0.039	44	47	137
3.50	0.046	51	55	160
4.00	0.052	58	62	183
4.50	0.059	66	70	206
5.00	0.066	73	78	229
5.50	0.072	80	86	252
6.00	0.079	88	94	275
6.50	0.085	95	101	298
7.00	0.092	102	109	321
7.50	0.098	110	117	344
8.00	0.105	117	125	366
8.50	0.111	124	133	389
9.00	0.118	131	140	412
9.50	0.124	139	148	435
10.00	0.131	146	156	458
10.50	0.138	153	164	481

LIQUID MANURE APPLICATION CHART

Test Date: 04/04/14
Source: Wastewater

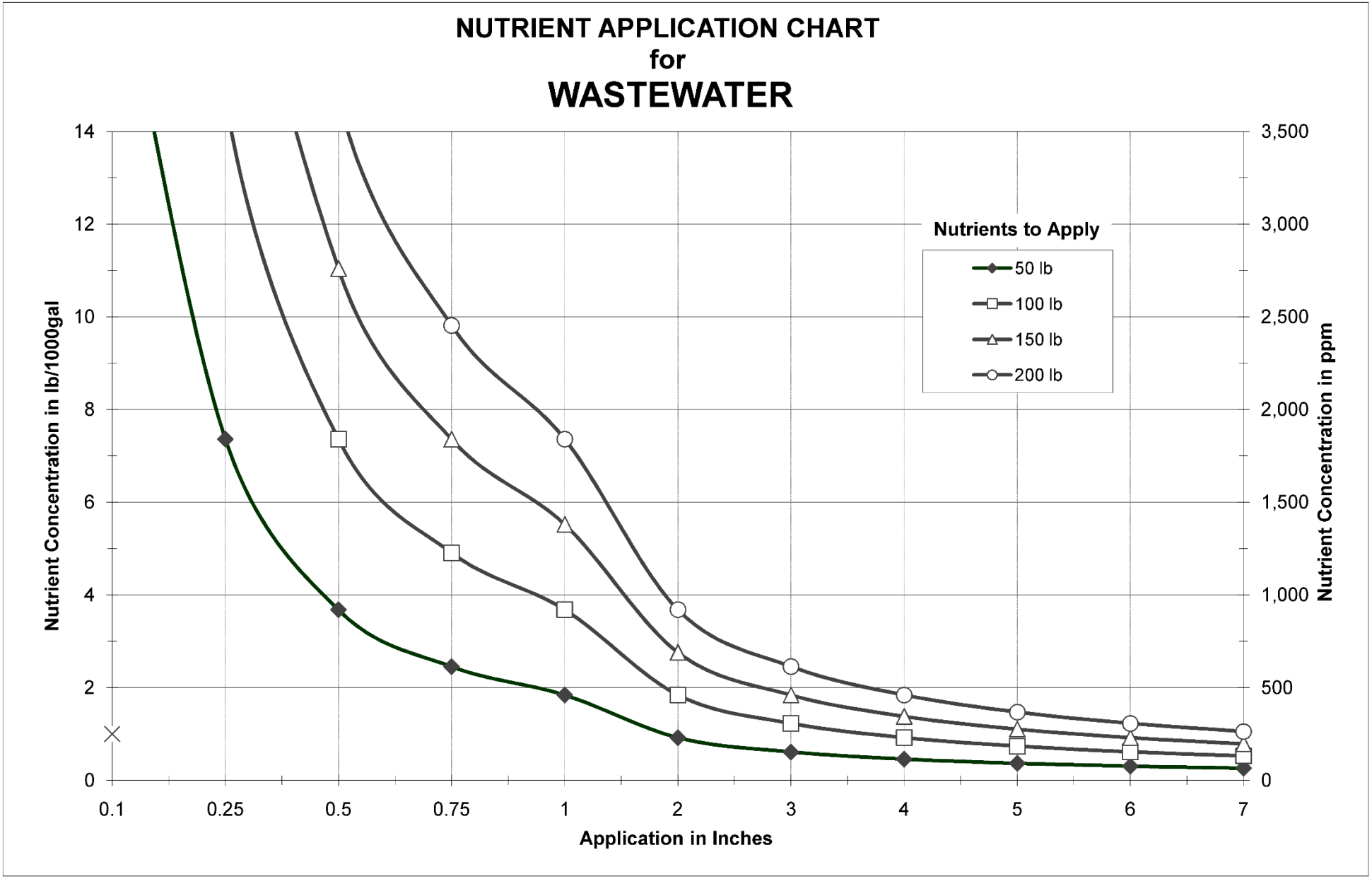
MANURE ANALYSIS
(As received lb/1000 gal)

Total N	P_2O_5	K_2O
0.83	1.67	2.00

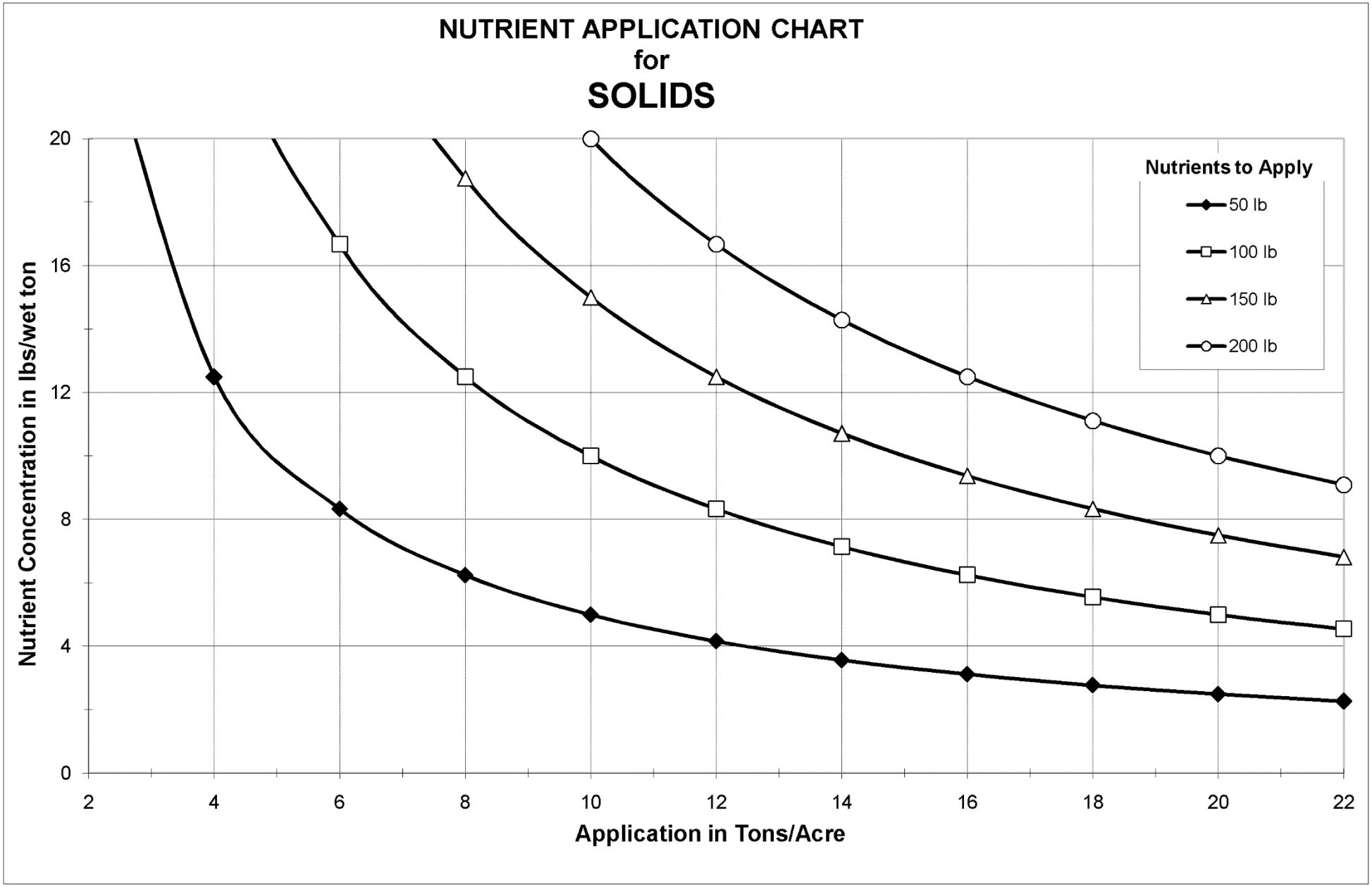
Manure Nutrient Content

Manure Applied	Thickness to apply	Total N	P_2O_5	K_2O
(Gallons/Ac)	(inches/Ac)	(lb/A)	(lb/A)	(lb/A)
2,715	0.10	2	5	5
5,431	0.20	5	9	11
8,146	0.30	7	14	16
10,862	0.40	9	18	22
13,577	0.50	11	23	27
16,292	0.60	14	27	33
19,008	0.70	16	32	38
21,723	0.80	18	36	43
24,439	0.90	20	41	49
27,154	**1.00**	**23**	**45**	**54**
29,869	1.10	25	50	60
32,585	1.20	27	54	65
35,300	1.30	29	59	71
38,016	1.40	32	63	76
40,731	1.50	34	68	81
43,446	1.60	36	73	87
46,162	1.70	38	77	92
48,877	1.80	41	82	98
51,593	1.90	43	86	103
54,308	2.00	45	91	109

UTILIZATION AREA



UTILIZATION AREA



UTILIZATION AREA

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. Irrigation water is supplied by wells and surface water sources using pumps through an underground pvc pipelines to sprinkler irrigation systems. The average amount of irrigation water to be applied per application and total annual amount needed for irrigated crops with guidance on when and how much irrigation water to apply can be found starting on page 3-19.

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.

No permits or water rights are needed for applying wastewater as a nutrient source.

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 (gpm)
A = area (acres)
D = gross application depth (in)
F = irrigation period (days)
H = hours of operation per day

Water Flow Rates:

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 **A** *where:*

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

Gpm for 5 ft/s velocity in PVC pipe:

6"	8"	10"	12"	14"
480	800	1250	1750	2150

NRCS *Natural Resources Conservation Service*

Water Volumes & Weights:

1 cubic foot = 7.48 gallons
= 62.4 lb = 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

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

UTILIZATION AREA

SOILS-

Based on the Natural Resources Conservation Service National Engineering Handbook, Part 652, National Irrigation Guide, the irrigated soils on this farm have an average water holding capacity of 0.15 inches per inch of soil depth and a soil intake rate of 0.50 inches per hour.

CROPS-

CROP	MATURE ROOT DEPTH (INCHES)	MAXIMUM ALLOWED DEPLETION	CRITICAL PERIOD
Alfalfa Haylage	**60**	**50%**	**July**
Barley/Oat/Pea Haylage	**36**	**50%**	**July**
Triticale/Wheat Haylage	**36**	**50%**	**July**

Above data are from EM8713, *Western Oregon Irrigation Guides*, June 1998, OSU: Corvallis, OR and NRCS *Irrigation Guide (National Engineering Handbook, Part 652)*.

IRRIGATION WATER SUPPLY-

Description of Oregon Water Right:	Permit- G12447, Certificates- S64131, G79698, G10329, G12437
Description of Irrigation Water Supply (Well, Stream, Irrigation District, etc.):	Lost River and Wells
Supply Flowrate (gpm or cfs):	14.21 CFS or 6,378 GPM
Annual Volume Available (Acre-ft.):	1,705 AF
Water Delivery Schedule:	On Demand
Method(s) of Water Measurement:	None

IRRIGATION SYSTEM-

System	System Capacity (gpm)	Nozzle Size (in)	Pressure (psi)	Spacing (ft)	Application Rate (in/hr)	System Efficiency (%)
Side Roll (Wheel Line) Sprinkler	231	11/64 and 3/16	50 to 60	60	0.26 to 0.3	75
Center Pivot Sprinkler	800	1/4	50 to 60	NA	0.7 to 0.8	80

UTILIZATION AREA

Irrigation Water Management Worksheet						
Crop Name:	**Alfalfa**					
Managed Rooting Depth (inches):	**48**					
Management Allowed Depletion, MAD:	**50%**					
Irrigated Acres:	**228**					
Soil Name:	**Hosley, Fordney, Calimus, Capona**					
Soil Depth (inches):	**48**					
Available Water Capacity (in/in):	**0.15**					
Soil Intake Rate (in/hr) :	**0.50**					
IRRIGATION REQUIREMENT HOW MUCH water to apply?	**Month**					
	April	**May**	**June**	**July**	**August**	**Sept**
Total Plant Available Water Capacity (in): Soil or Root Depth * Available Water Capacity	7.2	7.2	7.2	7.2	7.2	7.2
Net Irrigation Application (in): Total Plant Available Water Capacity * MAD	3.6	3.6	3.6	3.6	3.6	3.6
Irrigation System Application Rate (in/hr): Determined based on the type of Irrigation System	0.29	0.29	0.29	0.29	0.29	0.29
IRRIGATION TIMING WHEN to apply water?						
Net Irrigation Water Requirement (in): (From OSU Extension Miscellaneous Pub 8530, 1992)	0.00	2.60	5.55	7.28	5.29	0.00
Average Daily Crop Water Use (in/day):	0.00	0.08	0.19	0.23	0.17	0.00
Irrigation Frequency (days): Net Irrigation Application / Daily Crop Water Use	30	31	19	15	21	30
Irrigation System Set Time (hours):	**12**	**12**	**12**	**12**	**12**	**12**
Actual Net Irrigation Application (in): Gross Application * System Application Efficiency	**2.45**	**2.45**	**2.45**	**2.45**	**2.45**	**2.45**
Actual Irrigation Frequency (days): Actual Net Irrigation Application / Daily Crop Water Use	**30**	**29**	**13**	**10**	**14**	**30**
IRRIGATION SYSTEM CAPACITY						
System Application Efficiency (%): Water Required / Water Applied	70%	70%	70%	70%	70%	70%
Gross Irrigation Application (in): System Application Rate * System Set Time	3.50	3.50	3.50	3.50	3.50	3.50
Volume of Water per Irrigation (acre-in): Gross Irrigation Application * Irrigated Acres	799	799	799	799	799	799
Irrigation System Operation (hours/day):	16	16	16	16	16	16
Required System Flow Rate (gpm): (Equation 2)	**754**	**773**	**1,706**	**2,166**	**1,574**	**754**
Compare **Required** system flow rate with **Measured** flow noted on **Irrigation Application Record**						

UTILIZATION AREA

Irrigation Water Management Worksheet						
Crop Name:	**Barley/Oat/Pea/Triticale/Wheat Haylage**					
Managed Rooting Depth (inches):	**36**					
Management Allowed Depletion, MAD:	**50%**					
Irrigated Acres:	**330**					
Soil Name:	**Calimus, Henley, Hosley, Stukel**					
Soil Depth (inches):	**48**					
Available Water Capacity (in/in):	**0.20**					
Soil Intake Rate (in/hr) :	**0.40**					
IRRIGATION REQUIREMENT HOW MUCH water to apply?	**Month**					
	April	**May**	**June**	**July**	**August**	**Sept**
Total Plant Available Water Capacity (in): Soil or Root Depth * Available Water Capacity	7.2	7.2	7.2	7.2	7.2	7.2
Net Irrigation Application (in): Total Plant Available Water Capacity * MAD	3.6	3.6	3.6	3.6	3.6	3.6
Irrigation System Application Rate (in/hr): Determined based on the type of Irrigation System	0.29	0.29	0.29	0.29	0.29	0.29
IRRIGATION TIMING WHEN to apply water?						
Net Irrigation Water Requirement (in): (From OSU Extension Miscellaneous Pub 8530, 1992)	0.00	1.54	4.76	8.78	6.50	0.98
Average Daily Crop Water Use (in/day):	0.00	0.05	0.16	0.28	0.21	0.03
Irrigation Frequency (days): Net Irrigation Application / Daily Crop Water Use	30	31	23	13	17	30
Irrigation System Set Time (hours):	**12**	**12**	**12**	**12**	**12**	**12**
Actual Net Irrigation Application (in): Gross Application * System Application Efficiency	**2.45**	**2.45**	**2.45**	**2.45**	**2.45**	**2.45**
Actual Irrigation Frequency (days): Actual Net Irrigation Application / Daily Crop Water Use	**30**	**31**	**15**	**9**	**12**	**30**
IRRIGATION SYSTEM CAPACITY						
System Application Efficiency (%): Water Required / Water Applied	70%	70%	70%	70%	70%	70%
Gross Irrigation Application (in): System Application Rate * System Set Time	3.50	3.50	3.50	3.50	3.50	3.50
Volume of Water per Irrigation (acre-in): Gross Irrigation Application * Irrigated Acres	1156	1156	1156	1156	1156	1156
Irrigation System Operation (hours/day):	16	16	16	16	16	16
Required System Flow Rate (gpm): (Equation 2)	**1,091**	**1,056**	**2,118**	**3,780**	**2,799**	**1,091**
Compare **Required** system flow rate with **Measured** flow noted on **Irrigation Application Record**						

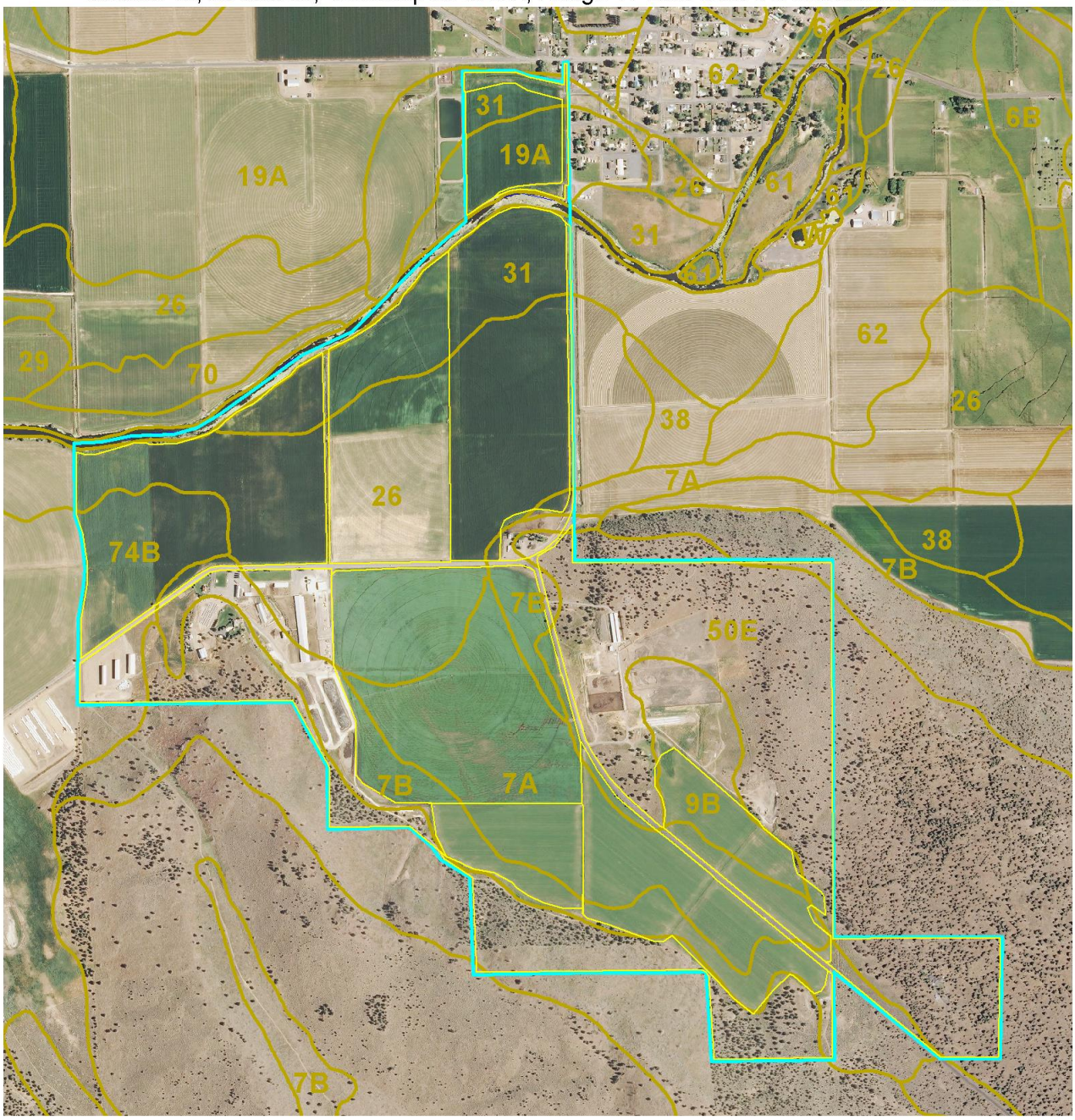
UTILIZATION AREA

SOIL AND RISK ASSESSMENT

SOIL MAP(S)

Bonanza View Dairy

Section 16, 21 and 22, Township 39 South, Range 11 East from the Willamette Meridian



Map Unit Legend

Klamath County, Oregon, Southern Part (OR640)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7A	Callmus loam, 0 to 2 percent slopes	136.3	13.7%
7B	Callmus loam, 2 to 5 percent slopes	105.3	10.6%
7C	Callmus loam, 5 to 15 percent slopes	0.1	0.0%
9B	Capona loam, 2 to 5 percent slopes	44.0	4.4%
19A	Fordney loamy fine sand, 0 to 2 percent slopes	24.6	2.5%
26	Henley loam	229.6	23.1%
31	Hosley loam	80.5	8.1%
50E	Lorella very stony loam, 2 to 35 percent south slopes	197.0	19.8%
51E	Lorella-Callmus association, steep north slopes	107.7	10.8%
74B	Stukel-Capona loams, 2 to 15 percent slopes	53.8	5.4%
W	Water	14.9	1.5%
Totals for Area of Interest		993.8	100.0%

SOIL AND RISK ASSESSMENT

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 and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils 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. Other minor components, however, have properties and behavioral 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 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

Klamath County, Oregon, Southern Part

7A—Calimus loam, 0 to 2 percent slopes

Map Unit Setting
Elevation: 4,100 to 4,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Calimus and similar soils: 59 percent
Minor components: 1 percent

Description of Calimus

Setting
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy sediment derived from tuff, basalt and diatomite

Typical profile
H1 - 0 to 11 inches: neutral, loam
H2 - 11 to 40 inches: slightly alkaline, loam
H3 - 40 to 60 inches: neutral, loam

Properties and qualities
Slope: 0 to 2 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 to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2c
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: B

Minor Components

Aquolls
Percent of map unit: 1 percent
Landform: Lake terraces

7B—Calimus loam, 2 to 5 percent slopes

Map Unit Setting
Elevation: 4,100 to 4,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 110 days

Map Unit Composition
Calimus and similar soils: 67 percent
Minor components: 1 percent

Description of Calimus

Setting
Landform: Terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Alluvium and lacustrine sediment derived from tuff, basalt and diatomite

Typical profile
H1 - 0 to 11 inches: neutral, loam
H2 - 11 to 40 inches: slightly alkaline, loam
H3 - 40 to 60 inches: neutral, 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 to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B

Minor Components

Aquolls
Percent of map unit: 1 percent
Landform: Lake terraces

7C—Calimus loam, 5 to 15 percent slopes

Map Unit Setting
Elevation: 4,100 to 4,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Calimus and similar soils: 78 percent

Description of Calimus

Setting
Landform: Terraces, alluvial fans
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Alluvium and lacustrine sediment derived from tuff, basalt and diatomite

Typical profile
H1 - 0 to 11 inches: neutral, loam
H2 - 11 to 40 inches: slightly alkaline, loam
H3 - 40 to 60 inches: neutral, loam

Properties and qualities
Slope: 2 to 15 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 to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.3 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: DEEP LOAMY 10-14 PZ (R021XY206OR)

9B—Capona loam, 2 to 5 percent slopes

Map Unit Setting
Elevation: 4,100 to 4,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Capona and similar soils: 77 percent

Description of Capona

Setting
Landform: Structural benches, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and residuum derived from tuff, diatomite and basalt

Typical profile
H1 - 0 to 11 inches: neutral, loam
H2 - 11 to 25 inches: neutral, gravelly sandy clay loam
H3 - 25 to 35 inches: , unweathered bedrock

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
*Capacity of the most limiting layer to transmit water (Ksat):*Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C

19A—Fordney loamy fine sand, 0 to 2 percent slopes

Map Unit Setting
Elevation: 4,050 to 4,180 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Fordney and similar soils: 72 percent
Minor components: 1 percent

Description of Fordney

Setting
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and lacustrine deposits derived from tuff

Typical profile
H1 - 0 to 8 inches: slightly alkaline, loamy fine sand
H2 - 8 to 60 inches: slightly alkaline, loamy sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups
Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Aquolls
Percent of map unit: 1 percent
Landform: Stream terraces

26—Henley loam

Map Unit Setting
Elevation: 4,050 to 4,150 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 80 to 110 days

Map Unit Composition
Henley and similar soils: 69 percent
Minor components: 1 percent

Description of Henley

Setting
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and lacustrine deposits

Typical profile
H1 - 0 to 11 inches: strongly alkaline, loam
H2 - 11 to 36 inches: strongly alkaline, sandy loam
H3 - 36 to 60 inches: , cemented material

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Somewhat poorly 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: About 12 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C

Minor Components

Aquolls
Percent of map unit: 1 percent
Landform: Lake terraces

31—Hosley loam

Map Unit Setting
Elevation: 4,050 to 4,200 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 80 to 110 days

Map Unit Composition
Hosley and similar soils: 87 percent
Minor components: 1 percent

Description of Hosley

Setting
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and lacustrine deposits

Typical profile
H1 - 0 to 12 inches: strongly alkaline, loam
H2 - 12 to 26 inches: strongly alkaline, clay loam
H3 - 26 to 42 inches: , cemented material
H4 - 42 to 62 inches: strongly alkaline, loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Somewhat poorly 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: About 12 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 3 percent
Salinity, maximum in profile: Nonsaline to slightly saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C/D

Minor Components

Aquolls
Percent of map unit: 1 percent
Landform: Lake terraces

50E—Lorella very stony loam, 2 to 35 percent south slopes

Map Unit Setting
Elevation: 4,140 to 5,500 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Lorella, south, and similar soils: 80 percent

Description of Lorella, South

Setting
Landform: Escarpments
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Very cobbly and gravelly colluvium and residuum derived from basalt and tuff

Typical profile
H1 - 0 to 5 inches: neutral, very stony loam
H2 - 5 to 10 inches: neutral, very cobbly clay loam
H3 - 10 to 19 inches: neutral, very gravelly clay
H4 - 19 to 29 inches: , unweathered bedrock

Properties and qualities
Slope: 2 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
*Capacity of the most limiting layer to transmit water (Ksat):*Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: LOAMY 10-14 PZ (R021XY200OR)

51E—Lorella-Calimus association, steep north slopes

Map Unit Setting
Elevation: 4,140 to 4,700 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 80 to 100 days

Map Unit Composition
Lorella, north, and similar soils: 60 percent
Calimus, north, and similar soils: 25 percent

Description of Lorella, North

Setting
Landform: Escarpments
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Very cobbly and gravelly colluvium and residuum derived from basalt and tuff

Typical profile
H1 - 0 to 5 inches: neutral, very stony loam
H2 - 5 to 10 inches: neutral, very cobbly clay loam
H3 - 10 to 19 inches: neutral, very gravelly clay
H4 - 19 to 29 inches: , unweathered bedrock

Properties and qualities
Slope: 15 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: NORTH SLOPES 14-18 PZ (R021XY312OR)

Description of Calimus, North

Setting
Landform: Escarpments
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lacustrine sediment

Typical profile
H1 - 0 to 14 inches: neutral, loam
H2 - 14 to 48 inches: slightly alkaline, loam
H3 - 48 to 60 inches: neutral, loam

Properties and qualities
Slope: 15 to 35 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 to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.6 inches)

Interpretive groups
Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: NORTH SLOPES 14-18 PZ (R021XY312OR)

74B—Stukel-Capona loams, 2 to 15 percent slopes

Map Unit Setting
Elevation: 4,100 to 4,700 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition
Stukel and similar soils: 55 percent
Capona and similar soils: 40 percent

SOIL AND RISK ASSESSMENT

Description of Stukel

Setting
Landform: Structural benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from tuff and diatomite

Typical profile
H1 - 0 to 7 inches: neutral, loam
H2 - 7 to 17 inches: neutral, loam
H3 - 17 to 27 inches: , unweathered bedrock

Properties and qualities
Slope: 2 to 15 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
*Capacity of the most limiting layer to transmit water (Ksat):*Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: LOAMY 10-14 PZ (R021XY200OR)

Description of Capona

Setting
Landform: Structural benches
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and residuum derived from tuff and diatomite

Typical profile
H1 - 0 to 11 inches: neutral, loam
H2 - 11 to 25 inches: neutral, gravelly sandy clay loam
H3 - 25 to 35 inches: , unweathered bedrock

Properties and qualities
Slope: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
*Capacity of the most limiting layer to transmit water (Ksat):*Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups
Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: LOAMY 10-14 PZ (R021XY200OR)

W—Water

Map Unit Composition
Water: 100 percent

Data Source Information

Soil Survey Area:	Klamath County, Oregon, Southern Part
Survey Area Data:	Version 9, Nov 26, 2013

SOIL AND RISK ASSESSMENT

PREDICTED SOIL EROSION

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info:

Owner name	*Tract #*	*Field name*
Bonanza View Dairy	**NA**	**1, 2**

Location	*Soil*	*T value, t/ac/yr*	*Slope length (horiz), ft*	*Avg. slope steepness, %*
Oregon\Klamath County\OR_Klamath_R13	19A FORDNEY LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES\FORDNEY loamy fine sand 72%	5.0	900	2.0

Alternatives:

Description	*Management*	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss*	*Soil conditioning index (SCI)*	*STIR value*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*	*Equiv. diesel use, gal/ac*	*Energy use, BTU/ac*	*Fuel cost, US$/ac*
Erosion on Hay Land	a.Single Year/Single Crop Templates\Alfalfa, fall seed, 4X, irr, Z32	a. rows up-and-down hill	(none)	(none)	0.0082	0.7	1.40	0	39	5400000	120
Erosion on Hay Land	a.Single Year/Single Crop Templates\Barley, fall seed, conv. till; CMZ 32; CA	a. rows up-and-down hill	(none)	(none)	0.013	1	172	0	5.5	760000	16
Erosion on Hay Land	a.Single Year/Single Crop Templates\Wheat, winter; fall disk, Z32	a. rows up-and-down hill	(none)	(none)	0.0096	1	108	0	3.7	510000	11

SOIL AND RISK ASSESSMENT

RUSLE2 Worksheet Erosion Calculation Record

Info:

Owner name	*Tract #*	*Field name*
Bonanza View Dairy	**NA**	**5, 8, 43**

Location	*Soil*	*T value, t/ac/yr*	*Slope length (horiz), ft*	*Avg. slope steepness, %*
Oregon\Klamath County\OR_Klamath_R13	26 HENLEY LOAM\HENLEY loam 69%	2.0	900	2.0

Alternatives:

Description	*Management*	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss*	*Soil conditioning index (SCI)*	*STIR value*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*	*Equiv. diesel use, gal/ac*	*Energy use, BTU/ac*	*Fuel cost, US$/ac*
Erosion on Hay Land	a.Single Year/Single Crop Templates\Alfalfa, fall seed, 4X, irr, Z32	a. rows up-and-down hill	(none)	(none)	0.018	0.8	1.40	0	45	6200000	130
Erosion on Hay Land	a.Single Year/Single Crop Templates\Barley, fall seed, conv. till; CMZ 32; CA	a. rows up-and-down hill	(none)	(none)	0.026	2	172	0	6.3	870000	19
Erosion on Hay Land	a.Single Year/Single Crop Templates\Wheat, winter; fall disk, Z32	a. rows up-and-down hill	(none)	(none)	0.019	1	108	0	4.2	580000	13

SOIL AND RISK ASSESSMENT

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info:

Owner name	*Tract #*	*Field name*
Bonanza View Dairy	**NA**	**16, 19, 30**

Location	*Soil*	*T value, t/ac/yr*	*Slope length (horiz), ft*	*Avg. slope steepness, %*
Oregon\Klamath County\OR_Klamath_R13	7A CALIMUS LOAM, 0 TO 2 PERCENT SLOPES\CALIMUS loam 59%	5.0	900	2.0

Alternatives:

Description	*Management*	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss*	*Soil conditioning index (SCI)*	*STIR value*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*	*Equiv. diesel use, gal/ac*	*Energy use, BTU/ac*	*Fuel cost, US$/ac*
Erosion on Hay Land	a.Single Year/Single Crop Templates\Alfalfa, fall seed, 4X, irr, Z32	a. rows up-and-down hill	(none)	(none)	0.014	0.8	1.40	0	45	6200000	130
Erosion on Hay Land	a.Single Year/Single Crop Templates\Barley, fall seed, conv. till; CMZ 32; CA	a. rows up-and-down hill	(none)	(none)	0.019	2	172	0	6.3	870000	19
Erosion on Hay Land	a.Single Year/Single Crop Templates\Wheat, winter; fall disk, Z32	a. rows up-and-down hill	(none)	(none)	0.014	1	108	0	4.2	580000	13

SOIL AND RISK ASSESSMENT

USDA NRCS Natural Resources Conservation Service

RUSLE2 Worksheet Erosion Calculation Record

Info:

Owner name	*Tract #*	*Field name*
Bonanza View Dairy	**NA**	**18**

Location	*Soil*	*T value, t/ac/yr*	*Slope length (horiz), ft*	*Avg. slope steepness, %*
Oregon\Klamath County\OR_Klamath_R13	9B CAPONA LOAM, 2 TO 5 PERCENT SLOPES\CAPONA loam 77%	2.0	900	5.0

Alternatives:

Description	*Management*	*Contouring*	*Strips / barriers*	*Diversion/terrace, sediment basin*	*Cons. plan. soil loss*	*Soil conditioning index (SCI)*	*STIR value*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*	*Equiv. diesel use, gal/ac*	*Energy use, BTU/ac*	*Fuel cost, US$/ac*
Erosion on Hay Land	a.Single Year/Single Crop Templates\Alfalfa, fall seed, 4X, irr, Z32	a. rows up-and-down hill	(none)	(none)	0.045	0.7	1.40	0	45	6200000	130
Erosion on Hay Land	a.Single Year/Single Crop Templates\Barley, fall seed, conv. till; CMZ 32; CA	a. rows up-and-down hill	(none)	(none)	0.079	2	172	0	6.3	870000	19
Erosion on Hay Land	a.Single Year/Single Crop Templates\Wheat, winter; fall disk, Z32	a. rows up-and-down hill	(none)	(none)	0.059	1	108	0	4.2	580000	13

SOIL AND RISK ASSESSMENT

The **SCI** is the **Soil Conditioning Index** rating. If the calculated index is a negative value, soil organic matter levels are predicted to decline under that production system. If the index is a positive value, soil organic matter levels are predicted to increase under that system.

The **STIR** value is the **Soil Tillage Intensity Rating**. It utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation as shown in the management description.

SOIL AND RISK ASSESSMENT

OREGON PHOSPHORUS INDEX (EAST)

FIELD SUMMARY & EASTERN OREGON P INDEX

Enter data in gray cells and select best choice from drop down menus.
Cells with blue font are completed automatically.

Grower:	Bonanza View Dairy
Application Plan by:	Bruce D. Wilson H&R Engineering LLC
Date:	February 23, 2015

Field	1, 2	5	8	16	18	19	30	43
Acres	31.3	78.6	94.2	30.0	33.8	59.1	129.2	104.9
Soil	19A Fordney	26 Henley	26 Henley	7B Calimus	9B Capona	7B Calimus	26 Henley	26 Henley
Soil test date	May 7,2010	May 3, 2013	May 3, 2013	April 3, 2014	April 3, 2014	April 3, 2014	April 3, 2014	April 3, 2014
Olsen P (ppm)	23	13	53	35	54	54	56	76
Acetate K (ppm)		1775	600	429	470	594	520	618
pH		8.2	7.5	6.7	6.7	6.7	6.9	7.1
SMP				7.3	7.1	7.3	7.1	7
TRANSPORT FACTORS								
Sheet & rill erosion (tons/ac-yr)	<1	<1	<1	<1	<1	<1	<1	<1
Sprinkler Irr erosion (tons/ac-yr)	no irrig. runoff	no irrig. runoff	no irrig. runoff	no irrig. runoff	no irrig. runoff	no irrig. runoff	no irrig. runoff	no irrig. runoff
Surface Irr erosion (tons/ac-yr)	<1	<1	<1	<1	<1	<1	<1	<1
Runoff Class	medium	medium	medium	low	medium	low	medium	medium
Distance to stream (ft)	<100 ft	<100 ft	<100 ft	>500 ft	>500 ft	>500 ft	>500 ft	<100 ft
Buffers	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.	> 30 ft or NRCS spec.
Drainage	no tiles	no tiles	no tiles	no tiles	no tiles	no tiles	no tiles	no tiles
SOURCE FACTORS								
Commercial P2O5 rate (lbs/ac)	0	0	0	0	0	0	0	0
Commercial P2O5 method	None applied	None applied	None applied	None applied	None applied	None applied	None applied	None applied
Commercial P2O5 timing	None applied	None applied	None applied	None applied	None applied	None applied	None applied	None applied
Organic P2O5 rate (lbs/ac)	325	608	325	608	608	608	608	325
Organic P2O5 method	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp	Surface App, no Incorp
Organic P2O5 timing	All months possible	All months possible	All months possible	All months possible	All months possible	All months possible	All months possible	All months possible
SCORE	33.3	45.4	40.1	27.1	53.0	29.5	53.5	45.2
P RUNOFF RISK RATING	Medium	Medium	Medium	Low	Medium	Low	Medium	Medium

COMMENTS

SOIL AND RISK ASSESSMENT

Oregon Phosphorus Index Risk Interpretation

P Index rating	Interpretation	Recommended Nutrient Limitation
West PI Score<13 East PI Score<30	Low potential for P movement from this site given current management practices and site characteristics. There is a low probability of an adverse impact to surface waters from P losses on this site. Soil test P and P losses are likely to increase in future due to N-based nutrient management from animal manure.	Nitrogen
West PI Score 13-25 East PI Score 30-100	Medium potential for P movement from this site given current management practices and site characteristics. Practices should be introduced to reduce P losses by surface runoff, subsurface flow, and erosion. Soil test P and P losses are likely to increase in future due to N-based nutrient management from animal manure.	Nitrogen
West PI Score >25-50 East PI Score >100-400	High potential for P movement from this site given current management practices and site characteristics. All practicable management practices to reduce P losses through surface runoff, subsurface flow, or erosion should be implemented.	Phosphorus
West PI Score >50 East PI Score >400	Very high potential for P movement from this site given current management practices and site characteristics. Active remediation techniques should be implemented in an effort to reduce the P loss potential from this site.	No manure

SOIL AND RISK ASSESSMENT

REFERENCES

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-P00062958CAFG EPA#OEG010230**

Name or Business Name – Bonanza View Dairy

Facility Location Address – 4721 Harpold Road

City – Bonanza **Zip Code - 97623** **County - Klamath**

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.
Bonanza View Dairy is a Large Concentrated CAFO currently permitted for 2,350 dairy animals consisting of 1,077 Milking and Dry Cows and 1,273 Heifers and Calves.

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

Large Concentrated **Medium Concentrated** **Medium Confined** **Small Confined** **Small Concentrated**
Large Federal CAFO **Medium Federal CAFO** **State CAFO**

E. Proposed change in permitted animal numbers: In the space below please describe your proposed animal numbers by herd composition or class.
Bonanza View Dairy is requesting to be permitted for 4,585 dairy animals consisting of 1,295 Milking and Dry Cows and 3,290 Heifers and Calves.

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)	2-27-2015 Date	Arie de Jong Print Name
Signature (operator or owner)	2-27-2015 Date	Jennelie de Jong Print Name

REFERENCES

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 *[list of general partners, their addresses, and telephone numbers]*
- **Sole Proprietorship** — Owner(s) *[each owner must sign the application]*
- **City, County, State, Federal, or other Public Facility** — Principal executive officer or ranking elected official
- **Limited Liability Company** — Member *[articles of organization]*
- **Trusts** — Acting trustee *[list of trustees, their addresses, and telephone numbers]*

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		
	Small Confined Waste water control facility or disposal system for wet wastes	***Medium Confined*** Waste water control facility or disposal system for wet *or* dry wastes	***Small Concentrated*** Significant contributor of pollutants to waters of the U.S. Designated by director [40CFR §122.23(b)(9)]	***Medium Concentrated*** Discharging pollutants to waters of the U.S. [40 CFR §122.23(b)(6)]	***Large Concentrated*** [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.

REFERENCES

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. 1-2009 (permit) was issued by the Oregon Department of Agriculture (ODA) and Department of Environmental Quality (DEQ) and became effective on **June 29, 2009**. The permit expires on **May 31, 2014**. A copy of the permit is enclosed. This Notice of Registration describes your specific permit registration information and an overview of permit requirements.

Your permit registration was renewed to CAFO Permit No. 1-2009 on **December 14, 2009**, based on information provided by you as follows:

Master Address No.AG-P0062958CAFG EPA Registration No. OEG010230

	Operator	Legal owner, if different
Name	ARIE DEJONG	ARIE AND JENNEKA DEJONG
Business Name	BONANZA VIEW DAIRY INC	
Mailing Address	4721 HARPOLD RD BONANZA, OR 97623	
Facility Address	4721 HARPOLD RD BONANZA, OR 97623	
Main Ph:	541/545/6173	
Cell	541/891/5914	
Maximum Number of Animals	The maximum number of animals that may be held at this **dairy CAFO** is **2,350 dairy animals** based on the following population: **1,077 milking and dry cows and 1,273 heifers and calves**. 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**. *Note: Large Concentrated CAFOs have additional requirements. Please see general permit.*	

Klamath County

Annual Permit Fee

Each fiscal year, you will be assessed an annual compliance fee of $25.00 to maintain your registration under this general permit.

For Questions/ Additional Information

If you have questions, call your regional livestock water quality specialist for **Area V** at **(541) 617-0055** 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

General Permit Conditions

The operator must be in compliance with all terms and conditions of the permit (not only this summary of the permit) at all times.

Prohibited Discharges
See permit section S2, p. 9 & 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 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.

When Discharge is Allowed
Permit sections S2.B, p. 9; S2.C, pp. 9 & 10.

Production Area: Discharges of process waste water to surface waters of the state are generally prohibited except:

- When rainfall events cause an overflow of process waste water from a facility designed, constructed, operated, and maintained to contain all process-generated waste waters plus the runoff and direct precipitation from a 25-year, 24-hour rainfall event provided these discharges do not cause or contribute to a violation of state water quality standards; or
- In the event of an upset or bypass condition. *These conditions are further defined in the 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.

P. 1 of 2.

Form 9/2009

REFERENCES

Land Application Area: Storm water runoff from the land application area is not considered a prohibited discharge and is allowed if the land is being managed in compliance with the AWMP approved by ODA.

Animal Waste Management Plan (AWMP) Requirement
Permit section S3, pp. 12-15.

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, p. 10.

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 are suitable.

Monitoring, Recordkeeping & Reporting
Permit section S4, pp. 16-19.

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. *Note: Large concentrated CAFOs have additional requirements.*

Land Application Rates & Timing
Permit sections S2.C, pp. 9 & 10; S3.C, p. 12 & 13.

You must apply manure, litter and process wastes to lands at agronomic rates in accordance with proper agricultural practices and as specified in a waste management plan that has been approved by ODA. 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 waste water application to frozen soil must be included in an AWMP. Land application of wastes or waste water 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, p. 18.

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. *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 at **(541) 617-0055** or CAFO Program support in Salem at **(503) 986-4699**.*

Annual Report
Permit section S4.D.2, p. 18.

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, p. 10.

S2.E. 2 of the permit states that you "must site, design, construct, operate, and maintain all waste storage facilities consistent with the AWMP. 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, pp. 7 & 8.

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 Jaindl

Ray Jaindl, Administrator
Natural Resources Division

P. 2 of 2.

Form 9/2009

OREGON CONFINED ANIMAL FEEDING OPERATION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT NUMBER 01-2009

State of Oregon
Department of Agriculture
Natural Resources Division
and
Department of Environmental Quality
Water Quality Division

In compliance with the provisions of Oregon Revised Statutes (ORS) Chapter 468B,
Oregon Administrative Rules (OAR) Chapter 603, Division 74,
The Federal Water Pollution Control Act as Amended (The Clean Water Act),
Title 33 United States Code, Section 1251 et seq., and
The National Pollutant Discharge Elimination System (NPDES) program.

Until this permit expires, is modified, or revoked, permittees who have properly obtained coverage under this permit are authorized to discharge to waters of the state in accordance with the special and general conditions the follow.

Ray Jaindl
Administrator
Natural Resources Division
Oregon Department of Agriculture

Neil Mullane
Administrator
Water Quality Division
Oregon Department of Environmental Quality

TABLE OF CONTENTS

DEFINITIONS 3

S1. PERMIT COVERAGE **5**
S1.A. When is a Permit Required? 5
S1.B. Election of Permit Coverage 6
S1.C. Requirements and Schedule to Obtain Permit Coverage 6
S1.D. What does this Permit Authorize? 6
S1.E. Request for Cancellation 7
S1.F. Individual Permit Coverage 7
S1.G. Request for Confidentiality 7
S1.H. Public Notice and Participation Requirements 7

S2. DISCHARGE LIMITATIONS AND OPERATING REQUIREMENTS **9**
S2.A. Discharge Limitations 9
S2.B. Production Area Limitations 9
S2.C. Land Application Limitations 9
S2.D. Direct Access by Animals to Surface Water in the Production Area Prohibited 10
S2.E. Waste Storage Facilities 10
S2.F. Prevention of System Overloading 10
S2.G. Handling of Animal Mortalities 10
S2.H. Proper Operation and Maintenance 10
S2.I. Maintaining Compliance if System Fails 10
S2.J. Setback Requirement Requirement 11
S2.K. Manure, Litter, or Process Waste Water Transfers 11
S2.l. Proper Disposal of Other Wastes 11

S3. ANIMAL WASTE MANAGEMENT PLAN **12**
S3.A. Animal Waste Management Plan (AWMP) Implementation and Compliance 12
S3.B. AWMP Submittal and Public Notice 12
S3.C AWMP Elements 12
S3.D. AWMP Updates and Changes 13

S4. MONITORING, INSPECTION, RECORDKEEPING, AND REPORTING REQUIREMENTS **16**
S4.A. Monitoring Requirements 16
S4.B. Inspection Requirements 17
S4.C. Record Keeping and Availability Requirements 17
S4.D. Reporting Requirements 17
S4.E. Additional Monitoring 19

GENERAL CONDITIONS

G1. Noncompliance reporting requirements 20
G2. Additional reporting requirements [40 CFR §122.41(1)] 20
G3. Duty to comply[40 CFR §122.24(a)] 21
G4. Compliance with other laws and statutes 22
G5. Property rights [40 CFR §122.41(g)] 22
G6. Duty to reapply 22
G7. Need to halt or reduce activity not a defense [40 CFR §122.41(c)] 22
G8. Duty to mitigate [40 CFR §122.41(d)] 22
G9. Proper operation and maintenance [40 CFR §122.41(e)] 22
G10. Permit actions 22
G11. Change of ownership or control 22
G12. Duty to provide information [40 CFR §122.41(h)] 22
G13. Inspection and entry [40 CFR §122.41(i)] 23
G14. Monitoring and records [40 CFR §122.41(j)] 23
G15. Signatory requirement [40 CFR §122.21(k)] 23
G16. Bypass [40 CFR §122.41(m)] 23
G17. Upset [40 CFR §122.41(n)] 24

DEFINITIONS

1. "25-year, 24-hour rainfall event" means an event with a probable recurrence interval of once in twenty-five years as defined by the National Weather Service in Technical Paper Number 40, "Rainfall Frequency Atlas of the United States," May 1961, or equivalent regional or state rainfall probability information developed from this source.

2. "40 CFR means Title 40 of the Code of Federal Regulations (2008).

3. "Animal waste management plan" or "AWMP" means a written document containing the minimum elements necessary to manage manure, litter, and process waste water from operations covered by this permit in accordance with the terms and conditions of this permit. See S3.C, p. 12, for specific plan elements.

4. "CAFO" or "Confined animal feeding operation" as defined in OAR 603-074-0010(3) and OAR 340-051-0010(2) means:
   (a) The concentrated confined feeding or holding of animals or poultry, including but not limited to horse, cattle, sheep, or swine feeding areas, dairy confinement areas, slaughterhouse or shipping terminal holding pens, poultry and egg production facilities and fur farms;
      (i) In buildings or in pens or lots where the surface has been prepared with concrete, rock or fibrous material to support animals in wet weather; or
      (ii) That have wastewater treatment works; or
      (iii) That discharge any wastes into waters of the state; or
   (b) An animal feeding operation that is subject to regulation as a concentrated animal feeding operation pursuant to 40 CFR §122.23.

5. "Director" means the director of the State of Oregon Department of Environmental Quality and the Department of Agriculture or their authorized designee(s).

6. "Discharge" when used without qualification means the "discharge of a pollutant." "Discharge of a pollutant" is defined at 40 CFR §122.2.

7. "Frozen soil" means soil that has a soil temperature of 32° F (or 0° C) or less in 3 continuous inches of the top twelve (12) inches of soil.

8. "Groundwater" means water in a saturated zone or stratum beneath the surface of land or below a surface water body.

9. "Manure" means manure or other material (e.g., bedding, compost, litter, feed waste, silage leachate, raw materials such as feed or silage) that comes into contact with manure.

10. "Medium confined animal feeding operation" means a confined animal feeding operation that meets the animal numbers specified in any of the following categories. A state medium confined animal feeding operation is only required to apply for this permit if it confines for more than four (4) months and has a waste water control facility or disposal system for wet *or* dry wastes. (See *Table 1: CAFOs Requiring Permit Coverage*.)
    (a) 200 to 699 mature dairy cattle, whether milked or dry;
    (b) 300 to 999 veal calves;
    (c) 300 to 999 cattle other than mature dairy cows or veal calves. Cattle includes but is not limited to heifers, steers, bulls and cow/calf pairs;
    (d) 750 to 2,499 swine each weighing 55 pounds or more;
    (e) 3,000 to 9,999 swine each weighing less than 55 pounds;
    (f) 150 to 499 horses;
    (g) 3,000 to 9,999 sheep or lambs;
    (h) 16,500 to 54,999 turkeys;
    (i) 9,000 to 29,999 laying hens or broilers, if the operation uses waste water control facilities for wet waste;
    (j) 37,500 to 124,999 chickens (other than laying hens), if the operation uses waste water control facilities for wet waste;
    (k) 25,000 to 81,999 laying hens, if the operation does not use waste water control facilities for wet waste;
    (l) 10,000 to 29,999 ducks if the operation does not use waste water control facilities for wet waste; or
    (m) 1,500 to 4,999 ducks if the operation uses waste water control facilities for wet waste.
    (n) For other animal types, ODA will determine the appropriate animal numbers by comparing the operation to the most similar animal type listed above.

11. "New source" means any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced after April 14, 2003.

12. "Overflow" means the discharge of manure or process waste water resulting from the filling of waste water or manure storage structures beyond the point at which no more manure, process waste water, or storm water can be contained by the structure.
13. "Person" is defined at OAR 603-074-0010(13).
14. "Point source" is defined at 40 CFR §122.2.
15. "Pollutant" is defined in 40 CFR §122.2.
16. "Pollution" or "water pollution" as defined in ORS 468B.005(5).
17. "Process waste water" or "process wastes" as defined at OAR 603-074-0010(17) and OAR 603-051-0010(2) means water directly or indirectly used in the operation of the CAFO for any or all of the following: spillage or overflow from animal or poultry watering systems; washing, cleaning or flushing pens, barns, manure pits, or other CAFO facilities; direct contact swimming, washing, or spray cooling of animals; or dust control. Process waste water or process wastes also includes any water that comes into contact with any raw materials, products, or byproducts including manure, litter, feed, milk, eggs, or bedding.
18. "Production area" as defined at OAR 603-074-0010(18) and OAR 603-051-0010(3) means that part of a CAFO that includes the animal confinement area, the manure storage area, the raw materials storage area, and the waste containment areas. The animal confinement area includes but is not limited to open lots, housed lots, feedlots, confinement houses, stall barns, free stall barns, milkrooms, milking centers, cowyards, barnyards, medication pens, walkers, animal walkways, and stables. The manure storage area includes but is not limited to lagoons, runoff ponds, storage sheds, stockpiles, under house or pit storages, liquid impoundments, static piles, and composting piles. The raw materials storage area includes but is not limited to feed silos, silage bunkers, and bedding materials. The waste containment areas include but are not limited to settling basins, and areas within berms and diversions that separate uncontaminated storm water. Also included in the definition of production area is any egg washing or egg processing facility, and any area used in the storage, handling, treatment, or disposal of animal mortalities.
19. "Saturated soil" means soil with all available pore space filled that has reached its maximum retentive capacity as defined in "Qualitative Description of Soil Wetness" (Brady, N. and Weil, R., p. 201).
20. "Setback" as defined at 40 CFR §412.4(b)(1) means a specified distance from surface waters or potential conduits to surface waters where manure, litter, and process waste water may not be land applied. Examples of conduits to surface waters include but are not limited to: Open tile line intake structures, sinkholes, and agricultural well heads.
21. "State confined animal feeding operation" means a confined animal feeding operation with animal numbers below the medium confined animal feeding operation levels that is not designated as a small concentrated animal feeding operation. A small confined animal feeding operation is only required to apply for this permit if it confines for more than for (4) months and has a waste water control facility or disposal system for wet wastes. (See *Table 1: CAFOs Requiring Permit Coverage*.)
22. "Vegetative buffer" as defined at 40 CFR §412.4(b)(2) means a narrow, permanent strip of dense perennial vegetation established parallel to the contours of and perpendicular to the dominant slope of the field for the purposes of slowing water runoff, enhancing water infiltration, and minimizing the risk of any potential nutrients or pollutants from leaving the field and reaching surface waters.
23. "Wastes" is defined at ORS 468B.005(9).
24. "Waste storage facilities" means the physical system used for the isolation and retention of process wastes on the confined animal feeding operation until their ultimate utilization.
25. "Waste water control facility" means a "disposal system" or "treatment works" is defined at ORS 468B.005(8).
26. "Water" or "waters of the state" is defined at ORS 468B.005(10).
27. "Waters of the U.S." is defined at 40 CFR §122.2.

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

S1.A. When is a Permit Required?

1. Pursuant to ORS 468B.200, it is the policy of the State of Oregon to protect the quality of groundwater and surface waters of Oregon by preventing animal wastes from discharging into waters of the state. To implement this policy, ORS 468B.050(1)(d) requires that any person who owns or operates a *confined animal feeding operation* (CAFO) listed in S1.A.2 below obtain a permit from ODA and DEQ. As a result, there is no state process to certify that a CAFO does not discharge or propose to discharge to waters of the state and permit coverage is required regardless of discharge status. Coverage under this general permit is required for all CAFOs listed in S!.A.2 unless application is made for an individual permit or an individual permit is required by ODA and DEQ.

2. Any person who owns or operates a CAFO defined as follows is required by ORS 468B.050(1)(d) to obtain coverage under this permit (see Table 1 below for more detail):
   (a) *State small confined animal feeding operation* that confines animals for more than four (4) months and has a waste water control facility or disposal system for wet <u>or</u> dry wastes.
   (b) *State medium confined animal feeding operation* that confines animals for more than four (4) months and has a waste water control facility or disposal system for wet <u>or</u> dry wastes.
   (c) *Small, medium, or large concentrated animal feeding operation* defined in 40 CFR §122.23(b).

Table 1: CAFOs Requiring Permit Coverage

Type of confined animal feeding operation requiring permit coverage	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		
	Small Confined • Waste water control facility or disposal system for wet wastes	***Medium Confined*** • Waste water control facility or disposal system for wet <u>or</u> dry wastes	***Small Concentrated*** • Significant contributor of pollutants to waters of the U.S. • Designated by Director [40 CFR §122.23(b)(9)]	***Medium Concentrated*** • Discharging pollutants to waters of the U.S. [40 CFR §122.23(b)(6)]	***Large Concentrated*** [40 CFR §122.23(b)(4)]
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	<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.

3. Any person not wishing to be covered by this permit may apply for an individual permit in accordance with OAR 340-045-0030.

Note: Failure to obtain coverage under this permit is a violation of ORS 468B.050 and 468B.215 except as provided in S1.F Individual Permit Coverage, p. 7.

S1.B. Election of Permit Coverage

Any person who owns or operates a CAFO who is not required to obtain coverage under this permit may elect to be covered by this permit. Any person making such an election is subject to all terms and conditions of the permit unless and until permit coverage is terminated.

S1.C. Requirements and Schedule to Obtain Permit Coverage

1. Application for Proposed CAFO
   To obtain permit coverage, any person proposing a new CAFO that is regulated by this permit (see S1.A above) or electing to be covered by this permit must submit an ODA *Application to Register* (ATR) and Animal Waste Management Plan (AWMP) at least 180 days prior to the time that the operation commences. For information on AWMP requirements, see S3, p. 12.

2. Future Renewal of General Permit Coverage
   To renew general permit coverage, the pemittee must submit a renewal application by the date specified by ODA but no later than the expiration date of this permit.

3. ODA will notify the applicant in writing if permit coverage is approved or denied. Permit coverage does not begin until this written notice is provided by ODA to the applicant. Written notification will include a *Notice of Registration* that will include the following:
   (a) The owner or operator's name;
   (b) Facility name and location;
   (c) Contact information including mailing address and telephone number;
   (d) Effective date of permit coverage;
   (e) Maximum number of animals allowed at the facility; and
   (f) Regulatory status of the operation.
      (i) ODA will use the following classifications for regulatory status:
         (1) *Large concentrated animal feeding operation* as defined in 40 CFR §122.23(b)(4);
         (2) *Medium concentrated animal feeding operation* as defined in 40 CFR §122.23(b)(6);
         (3) *Small concentrated animal feeding operation* as defined in 40 CFR §122.23(b)(9) and designated by the director pursuant to ORS 603-074-0012;
         (4) *Medium confined animal feeding operation* as defined in this permit (#10, p. 3); or
         (5) *Small confined animal feeding operation* as defined in this permit (#21, p. 4).
      (ii) A *small or medium confined animal feeding operation* will be categorized as *concentrated* if:
         (1) A discharge to waters of the U.S. occurs that is not allowed by this general permit, and
         (2) The operator does not or cannot make the change(s) necessary to prevent such discharge from recurring to the satisfaction of ODA.

4. Coverage under this permit will be canceled upon the issuance of an individual permit.

S1.D. General Permit Coverage

1. Consistent with ORS 468B.200, ODA and DEQ developed this general permit to prohibit routine discharges of manure, litter, and process waste water from CAFO operations to waters of the state. Discharges of manure, litter, or process waste water to waters of the state are only expected to occur under extreme weather conditions and as limited by the conditions of this general permit. Further, the general permit only authorizes the discharge of pollutants resulting from the processes, wastes, and operations that have been clearly identified in the permittee's AWMP approved by ODA.

2. This permit does not cover disposal of human wastes or waste water control systems that mix human and animal wastes. Any person owning or operating such a system must apply to DEQ for coverage under an individual or general permit issued pursuant to ORS 468B.050. This general permit for CAFOs may be used in addition to an individual or general permit issued by DEQ pursuant to ORS 468B.050.

3. Except for any toxic effluent standards and prohibitions imposed under section 307 of the federal Clean Water Act (CWA) and groundwater protection requirements established under OAR 340-040, a permittee in compliance with this permit during its term is considered to be in compliance, for purposes of enforcement, with state water quality laws and relevant sections of the CWA, as provided in 40 CFR §122.5. The specific effect of permit compliance on enforcement authority is set out in OAR 340-045-0080.

S1.E. Request for Cancellation

1. Any permittee may request in writing to ODA that coverage under this permit be cancelled if:
   (a) Conditions or standards have changed so that the CAFO no longer qualifies for or is required to have coverage under this permit; or
   (b) The CAFO no longer has animals on site and all waste storage and control facilities have been decommissioned in accordance with Natural Resources Conservation Service (NRCS) conservation practice standard, code 360, entitled *Closure of Waste Impoundments (Jan. 2006)*; and
   (c) The permittee certifies that it will not commence operation of a CAFO regulated by this permit at the same location without making a new application for registration under this general permit and is granted coverage or applies for and is issued an individual permit.

2. ODA will respond to the request for cancellation by conducting a site inspection and a review of the permittee's file. ODA will notify the permittee in writing of termination of coverage under this permit or deny the request with an explanation of why the request was denied.

S1.F. Individual Permit Coverage

1. When appropriate, the director may require any person to obtain an individual permit pursuant to OAR 340-0033(10). In such cases, the person will be notified in writing by the director. This written notice will include the reason why an individual permit is being required, an application form, the amount of the permit fee due at application, and application due date.

2. If coverage under this permit has been obtained prior to the requirement for an individual permit, this permit will remain effective until the individual permit is issued provided the application for individual permit was properly made.

S1.G. Request for Confidentiality

The name and address of an NPDES permit applicant or permittee, NPDES permit applications (e.g., *ODA ATRs*) and their attachments (e.g., AWMPs), NPDES permits, and NPDES permit discharge data cannot be kept confidential pursuant to 40 CFR §122.7(b) and (c). For other information, the permittee may request that the director evaluate claims of confidentiality according to the procedures established in ORS 468.095(2).

S1.H. Public Notice and Participation Requirement

1. Prior to approving new permit coverage, renewing permit coverage, or approving proposed substantial changes to an AWMP, ODA will provide public notice and participation in Table 2 below.

2. ODA may batch multiple notices as regionally appropriate.

3. Application and permit documents (e.g., *ODA ATR*, renewal application, AWMP) will be available for public review at ODA headquarters and appropriate field offices. If available, electronic copies of documents will be provided upon request.

4. Public hearings will be scheduled if written requests for public hearing are received during the comment period from at least ten persons or from an organization or organizations representing at least ten persons. If a hearing is scheduled, ODA will provide at least 30 days notice before the hearing is held. The public comment period will remain open for additional comments for at least 7 days after the public hearing.

Table 2: CAFO Public Notice Requirements

	All Operations		Small or Medium Confined	Small, Medium or Large Concentrated
Permit Action	1. Receipt of ODA *ATR* (*Application to Register*) for existing operation not under permit or new proposed operation	1. Receipt of renewal application	2. Receipt of proposed substantial change to *small or medium confined animal feeding operation's* AWMP (see S3.D.1, p. 13)	3. Receipt of proposed substantial change to *small or medium, or large concentrated animal feeding operation's* AWMP (see S3.D.2, p. 14)
Public Participation Process	(i) Public notice of a comment period of at least 35 days provided as follows: • Published in regional newspaper; • Posted on ODA and DEQ websites; and • Emailed to interested parties list maintained by ODA. (ii) Opportunity for public hearing. See S1.H.4, p. 7. (iii) A written response to relevant comments will be developed by ODA and made available to interested parties.	(i) Public notice of a comment period of at least 35 days provided as follows: • Posted on ODA and DEQ websites; and • Emailed to interested parties list maintained by ODA. (ii) Opportunity for public hearing. See S1.H.4, p. 7. (iii) A written response to relevant comments will be developed by ODA and made available to interested parties.	(i) Public notice of a comment period of at least 14 days provided as follows: • Posted on ODA and DEQ websites; and • Emailed to interested parties list maintained by ODA. (ii) Opportunity for public hearing. See S1.H.4, p. 7. (iii) A written response to relevant comments will be developed by ODA and made available to interested parties.	(i) Public notice of a comment period of at least 35 days provided as follows: • Posted on ODA and DEQ websites; and • Emailed to interested parties list maintained by ODA. (ii) Opportunity for public hearing. See S1.H.4, p. 7. (iii) A written response to relevant comments will be developed by ODA and made available to interested parties.
Contents of Public Notice Note: Access to the AWMP will also be provided for public review; however, not all AWMPs will be available electronically.	• Name of operation • Name of operator or owner if different than operator, mailing address, and telephone number • Physical address of operation • Type of operation • Number of animals proposed • Land Use Compatibility Statement (LUCS) • AWMP summary	• Name of operation • City, county, and zip code • Permit registration number • Type of operation	• Name of operation • City, county, and zip code • Permit registration number • Type of operation • Overview of proposed substantial change	• Name of operation • City, county, and zip code • Permit registration number • Type of operation • Overview of proposed substantial change

S2. DISCHARGE LIMITATIONS AND OPERATING REQUIREMENTS

S2.A. Discharge Limitations

The permittee is prohibited from discharging manure, litter, or process wastes to surface waters and groundwaters of the state, except as allowed in S2.B and S2.C and provided these discharges allowed in S2.B and S2.C do not cause or contribute to a violation of state water quality standards. Discharges to surface water due to upset or bypass are authorized only in accordance with applicable requirements in G16 Bypass [40 CFR §122.41(m)], p. 23 and G17 Upset [40 CFR §122.41(n)], p. 24.

Types of discharge that are prohibited include but are not limited to: contaminated runoff from confinement or waste accumulation areas; overflow or discharges from waste storage facilities; discharges due to improper land application activities from surface drainages or field tile outlets, discharges due to equipment failure; or leakage or seepage from facilities in the production area in excess of approved designs.

S2.B. Production Area Limitations

1. For all *small and medium confined animal feeding operations* and *small, medium, and large concentrated animal feeding operations*, except new source swine, poultry, and veal *large concentrated animal feeding operations*:
   The permittee is prohibited from discharging manure, litter, or process waste water to surface waters of the state from the production area, except when:
   (a) Rainfall events cause an overflow of waste management and storage facilities designed, constructed, operated, and maintained to contain all manure, litter, and process waste waters including the contaminated runoff and direct precipitation from a 25-year, 24-hour rainfall event; and
   (b) The production area is operated in accordance with the applicable inspection, maintenance, recordkeeping, and reporting requirements of this permit.

2. For new source swine, poultry, and veal *large concentrated feeding operations*:
   The permittee is prohibited from discharging manure, litter, or process waste water to surface waters of the state.

3. The permittee must properly land apply or otherwise handle authorized discharges from the production area in a way that minimizes impacts on surface water or groundwater of the state and complies with state water quality standards.

4. The permittee must not exceed the seepage design rates approved by ODA for waste storage or animal confinement facilities and seepage to groundwater from these facilities must not violate state groundwater quality protection standards.

S2.C. Land Application Limitations

1. When applying manure, litter, and process waste water to lands, the permittee must apply at agronomic rates in accordance with the permittee's ODA-approved AWMP. Land application areas include land under the control of the permittee, whether it is owned, rented, or leased, to which manure, litter, or process waste water from the production area is or may be applied.

2. The permittee's discharges to groundwater due to seepage below the root zone of the crop or by other means must not violate state groundwater quality protection standards.

3. The permittee is allowed to apply manure, litter, or process waste water to frozen soil provided:
   (a) Its AWMP addresses such applications [see S3.C.3(j)];
   (b) Discharge to surface waters and groundwaters of the state will not occur, except as allowed in S2.B and S2.C; and
   (c) Land applications do not cause or contribute to a violation of state water quality standards.

4. The permittee is prohibited from applying manure, litter, or process waste water to saturated soils or during rainfall events that are expected to result in saturated soils or surface runoff. When such a application is a desired alternative to allowing waste storage or waste water control facilities to overflow (e.g., land application to saturated soils to pond waste water onsite provides for greater protection of surface waters than a direct overflow of a waste storage tank to surface waters), the land application will be considered an upset condition and the permittee must comply with the provisions of G17 Upset [40 CFR §122.41(n)], p. 24.

S2.D. Direct Access by Animals to Surface Water in the Production Area Prohibited

The permittee must prevent direct animal contact with surface waters of the state in the production area of its CAFO. Direct animal contact means any situation where animals in the production area have free access and are allowed to loiter or drop waste in surface waters. Direct contact with surface waters by animals on pasture or rangeland is not, by itself, a violation of this permit.

S2.E. Waste Storage Facilities

1. The permittee 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 Condition S2.C, p. 9 of this permit.

2. The permittee must site, design, construct, operate, and maintain all waste storage facilities consistent with the AWMP. 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.

3. The permittee with a *large concentrated animal feeding operation* must also have depth markers in all surface liquid impoundments (e.g., lagoons, ponds, tanks) designed to clearly indicate the:
   (a) Maximum design volume,
   (b) Minimum capacity necessary to contain the 25-year, 24-hour rainfall event, including additional freeboard requirements, and
   (c) Depth of manure and process waste water.

S2.F. Prevention of System Overloading

1. The permittee may not increase the number of animals over 10% or 25 animals, whichever is greater, of the maximum number assigned by ODA in the *Notice of Registration and General Permit Summary* until an updated plan is approved in writing by ODA (see S3.B AWMP Submittal, p. 12, and S3.D AWMP Changes, p. 13).

2. Animal numbers must not exceed the capacity of the waste storage facilities.

S2.G. Handling of Animal Mortalities

The permittee must not dispose of animal mortalities in liquid manure or waste water control facilities. Animal mortalities must be handled in such a way as to prevent discharge of pollutants to surface water or groundwater.

S2.H. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems used for process waste water collection, storage and utilization, and correct any deficiencies found as soon as possible.

S2.I. Maintaining Compliance if System Fails

The permittee must control all applications and discharges upon reduction, loss or failure of the waste storage or utilization facilities until the facilities are restored or an alternative method of storage or utilization is provided.

S2.J. Setback Requirement

The permittee must develop a setback for any mechanical application of manure, litter, or process waste water occurring in the land application area(s) adjacent to any surface waters, open tile intake structures, sinkholes, well heads, or other conduits to surface or ground waters where manure, litter, and other process waste waters are prohibited. The setback distances must be included in the permittee's AWMP. For *large concentrated animal feeding operation*, this setback must be 100 feet or as a compliance alternative and if demonstrated to the satisfaction of ODA in the AWMP, the permittee for the *large concentrated animal feeding operation* may:

1. Establish a 35-foot vegetated buffer where manure, litter, and other process waste waters are prohibited; or

2. Demonstrate that a setback or vegetated buffer is not necessary or may be reduced because implementation of alternative conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions that would be achieved by the 100 foot setback.

S2.K. Manure, Litter, or Process Waste Water Transfers

1. The permittee retains responsibility of the manure, litter, or process waste water until the transfer or export is completed with the required documentation.

2. The permittee must maintain manure, litter, or process waste water transfer or export records as required by S4.C.2(d), p. 17.

3. Prior to transferring manure, litter, or process waste water to other persons, the permittee with a *large concentrated animal feeding operation* must provide the recipient of manure, letter, or process waste water with the a manure nutrient analysis conducted within the previous 12 months.

S2.L. Proper Disposal of Other Wastes

Chemicals, contaminants, and other wastes may not be disposed of in any treatment or storage system for contaminated storm water from the production area, manure, litter, or process waste water unless the system is designed to treat such chemicals, contaminants, or wastes and the chemical, contaminants, or other wastes are identified in the AWMP. In addition, chemicals, contaminants, and other wastes may not be disposed of in any system designed for diversion of uncontaminated storm water.

S3. ANIMAL WASTE MANAGEMENT PLAN

S3.A. Animal Waste Management Plan (AWMP) Implementation and Compliance

1. Upon registration to this permit, the permittee must implement its current ODA-approved AWMP developed for its CAFO.

2. The permittee's ODA approved AWMP is incorporated into this permit by reference. The permittee must comply with all terms and conditions of its ODA-approved AWMP. Failure to comply with the ODA-approved AWMP constitutes a violation of the terms and conditions of this permit.

3. Absence of a AWMP or absence of ODA approval of an AWMP does not allow the permittee to violate the provisions of S2 Discharge Limitations and Operating Requirements, p. 9 or other permit requirements.

S3.B. AWMP Submittal and Public Notice

1. The applicant proposing a new CAFO or electing coverage under this permit must submit its AWMP with the *ODA ATR* to ODA for review and approval according to the schedule provided in S1.C, p. 6.

2. If necessary to meet the AWMP requirements in this permit, the existing permittee with coverage under the previous version of this general permit must submit a revised or updated AWMP prior to renewing registration under this permit.

3. AWMPs are subject to public notice and participation requirements detailed in condition S1.H, p. 7.

S3.C. AWMP Elements

1. The permittee must ensure that its AWMP is adequate for the proposed or existing population of animals, reflective or the proposed or existing facility operation, and be prepared in accordance with the terms and conditions of this permit, OAR 340-051, and NRCS conservation practice standard guidance 590 for Oregon dated May 2008 entitled *Nutrient Management*.

   Note: In the event of any inconsistency between the conditions of this permit and NRCS 590, the conditions of this permit apply.

2. The AWMP may include a schedule for improvement projects.

3. The AWMP must to the extent applicable include the following:
   (a) Procedures to ensure adequate collection, handling, and storage of contaminated strom water runoff from the production area, manure, litter and process waste water in compliance with the requirements of S2. Discharge Limitation and Operating Requirements. Calculations used to determine that storage capacity exists must be provided, including a demonstration the facilities are at least designed and constructed to contain all manure, litter, process waste water, contaminated storm water runoff from the production area, and direct precipitation from a 25-year, 24-hour rainfall event.
   (b) Procedures to ensure proper operation and maintenance of the storage facilities;
   (c) Procedures to ensure proper management of animal mortalities. Animal mortalities may not be disposed of in any storage or treatment system that is not specifically designed to treat animal mortalities;
   (d) Procedures to ensure that clean water is diverted, as appropriate, from the production area;
   (e) Procedures to prevent direct contact of confined animals with surface waters;
   (f) Identification of appropriate site-specific conservation practices to be implemented, including buffers, setback areas, or equivalent practices, to control runoff of pollutants to surface water and groundwater;
   (g) Protocols to land apply manure, litter or process waste water in accordance with site specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter or process waste water. The protocols must include the following:
      (i) The NRCS Phosphorous Index, USDA/NRCS Oregon Agronomy Technical Note #26, revised June 2008, must be completed for all fields that receive manure , litter or process waste water to determine if nitrogen or phosphorous is the most limiting nutrient. The maximum nutrient

application rate must be calculated for the most limiting nutrient (from Technical Note #26) and must account for all other nitrogen and phosphorus sources.

(ii) Expected crop yields.

(iii) Calculations showing the total nitrogen and phosphorus to be applied annually to each field, including sources other than manure, litter, or process waste water.

(iv) Annual manure application rates and an explanation of the basis for determining these rates. For *large concentrated animal feeding operations*, these rates must be based on actual test data. For other operations, data or "book values" from established reference sources (e.g., Oregon Animal Waste Management program) may be used instead of actual testing.

(v) Method(s) used to apply manure, litter, or process waste water.

(h) For *large concentrated animal feeding operations*, protocols for appropriate testing of manure, litter, process waste water, and soil. For other operations, references used instead of actual testing data or test protocols if testing.

(i) If applicable, an Agricultural Compost Management Plan as required by OAR 340-096.

(j) Frozen soil application procedures if applications of manure, litter, or process waste water will be made to frozen soil. At a minimum, the following must be provided:

(i) Description of the potential receiving field(s), estimates of waste amounts and types, and estimated timing of applications.

(ii) Aerial photo(s) identifying all areas and surface water bodies within 1,000 ft. of the boundaries of the receiving field(s).

(iii) Soil map(s) identifying soil types for receiving field(s).

(iv) Topographic map(s) for receiving field(s).

(v) Description of the structural practices in place to ensure that no discharges to surface water occur during application and after the soil thaws.

(vi) Description of the method used to determine when soil is frozen and management practices to be followed when planning an application and during and after an application to frozen soil.

(vii) Description of monitoring and reporting requirements to ensure that the permittee is in compliance with frozen soil application procedures.

(k) Procedures for transfer or export of manure, litter, or process waste water.

(l) Identification of specific records that will be maintained to document the implementation and management of the minimum elements described above.

S3.D. AWMP Changes

1. Requirements for *small or medium confined animal feeding operations* (see Table 3,p. 15, for an overview)

(a) *Substantial changes*. The permittee must submit any proposal to make substantial changes to its AWMP to ODA for approval at least 45 days in advance of the proposed changes. ODA will public notice the proposal as described in S1.H, p. 7. ODA will notify the permittee of its final decision concerning the proposed changes after the public notice period ends. The permittee may not implement a proposed change until ODA has approved it. The following types of changes to an AWMP are considered substantial:

(i) A change in the type of manure system including but not limited to switching from a dry to a liquid manure system, switching from a liquid to a dry manure system, or changing the manure system to accommodate an animal species or type of operation not included in the scope of the current AWMP.

(ii) An increase in maximum allowed animal numbers such that the operation becomes defined as a *large concentrated animal feeding operation*.

(b) *Non-substantial changes*. Public notice of non-substantial changes (described below) to an AWMP is not required; however, the permittee must submit its proposal to make such a change to ODA for approval at least 45 days in advance of the proposed change unless a different timeframe is allowed by ODA. ODA will notify the permittee of its final decision concerning the proposed change after reviewing the proposal. The permittee may not implement a proposed change until ODA has approved it. The following changes to an AWMP are considered non-substantial provided they do not result in a substantial modification listed in paragraph (a) above:

(i) An increase in animal numbers greater than 10% of the registrant's maximum allowed animal numbers provided the increase does not change the operation into a large concentrated animal feeding operation.

(ii) When facility expansions, production increases, or process modifications will result in new or increased generation of waste, litter, or process waste water beyond the scope of the current AWMP.

2. Requirements for *small, medium or large concentrated animal feeding operations* (see Table 3,p. 15, for an overview):

(a) *Substantial changes*. The permittee must submit any proposal to make substantial changes to its AWMP to ODA for approval at least 60 days in advance of the proposed changes. ODA will public notice the proposal as described in S1.H, p. 7. ODA will notify the permittee of its final decision concerning the proposed changes after the public notice period ends. The permittee may not implement a proposed change until ODA has approved it. The following types of changes to an AWMP are considered substantial:

(i) Addition of new land application areas not previously included in the AWMP, unless the land application area is covered by an existing AWMP that has already been incorporated into an existing NPDES permit and the application of manure, litter, or process waste water on the newly added land application area is in accordance with that existing NPDES permit.

(ii) Any changes to the field-specific maximum annual rates for land application.

(iii) Any changes to the maximum amounts of nitrogen and phosphorus derived from all sources for each crop.

(iv) Addition of any crop or other uses not included in the AWMP and corresponding field-specific rates of application.

(v) A change in the type of manure system including but not limited to switching from a dry to a liquid manure system, switching from a liquid to a dry manure system, or changing the manure system to accommodate an animal species or type of operation not included in the scope of the current AWMP.

(vi) Any changes that are likely to increase the risk of nitrogen and phosphorus transport to surface waters or groundwaters.

(b) *Non-substantial changes*. Public notice of non-substantial changes (described below) to an AWMP is not required; however, the permittee must submit its proposal to make such a change to ODA for approval at least 60 days in advance of the proposed change unless a different timeframe is allowed by ODA. ODA will notify the permittee of its final decision concerning the proposed change after reviewing the proposal. The permittee may not implement a proposed change until ODA has approved it. The following changes to an AWMP are considered non-substantial provided they do not result in a substantial modification listed in paragraph (a) above:

(i) An increase in animal numbers greater than 10% of the registrant's maximum allowed animal numbers.

(ii) When facility expansions, production increases, or process modifications will result in new or increased generation of waste, litter, or process waste water beyond the scope of the current AWMP.

Table 3: Overview of Requirements for Proposed Changes to AWMPs

	SMALL OR MEDIUM CONFINED		SMALL, MEDIUM OR LARGE CONCENTRATED	
	Substantial Change	***Non-Substantial Change***	***Substantial Change***	***Non-Substantial Change***
Description of proposed change	1. A change in the type of manure system including but not limited to switching from a dry to a liquid manure system, switching from a liquid to a dry manure system, or changing the manure system to accommodate an animal species or type of operation not included in the scope of the current AWMP. 2. An increase in maximum allowed animal numbers such that the operation becomes defined as a large concentrated animal feeding operation.	The following are considered non-substantial provided they do not result in a substantial change: 1. An increase in animal numbers greater than 10% of the registrant's maximum allowed animal numbers. 2. When facility expansions, production increases, or process modifications will result in new or increased generation of waste, litter, or process waste water beyond the scope of the current AWMP.	1. Addition of new land application areas not previously included in the AWMP, unless the land application area is covered by an existing AWMP that has already been incorporated into an existing NPDES permit and the application of manure, litter, or process waste water on the newly added land application area is in accordance with that existing NPDES permit. 2. Any changes to the field-specific maximum annual rates for land application. 3. Any changes to the maximum amounts of nitrogen and phosphorus derived from all sources for each crop. 4. Addition of any crop or other uses not included in the AWMP and corresponding field-specific rates of application. 5. A change in the type of manure system including but not limited to switching from a dry to a liquid manure system, switching from a liquid to a dry manure system, or changing the manure system to accommodate an animal species or type of operation not included in the scope of the current AWMP. 6. Any changes that are likely to increase the risk of nitrogen and phosphorus transport to surface waters or groundwaters.	The following are considered non-substantial provided they do not result in a substantial change: 1. An increase in animal numbers greater than 10% of the registrant's maximum allowed animal numbers. 2. When facility expansions, production increases, or process modifications will result in new or increased generation of waste, litter, or process waste water beyond the scope of the current AWMP.
Timeline to submit proposal to ODA	Submit at least 45 days in advance of proposed change(s).	Submit at least 45 days in advance of proposed change(s) unless a different timeframe allowed by ODA.	Submit at least 60 days in advance of proposed change(s).	Submit at least 60 days in advance of proposed change(s) unless a different timeframe allowed by ODA.
Public notice process .	ODA will public notice as described in S1.H, p. 7.	Not required.	ODA will public notice as described in S1.H, p. 7.	Not required.
ODA approval	ODA will notify the permittee of its final decision concerning the proposed change(s) after the public notice period ends.	ODA will notify the permittee of its final decision concerning the proposed change(s) after reviewing the proposal.	ODA will notify the permittee of its final decision concerning the proposed change(s) after the public notice period ends.	ODA will notify the permittee of its final decision concerning the proposed change(s) after reviewing the proposal.

S4. MONITORING, INSPECTION, RECORDKEEPING, AND REPORTING REQUIREMENTS

S4.A. Monitoring Requirements

1. Discharge Monitoring

   If a discharge to surface water or groundwater occurs that is not allowed by S2.B or S2.C, p. 9, the permittee must record the following information:

   (a) A description and cause of the discharge;
   (b) The period of discharge including exact dates, times and duration of discharge;
   (c) An estimate of discharge volume;
   (d) Name or location of receiving water; and
   (e) Corrective steps taken, if appropriate, to reduce, eliminate or prevent reoccurrence of the discharge.

2. Analytical Monitoring

   The permittee must conduct the following sampling and analysis according to the following schedule:

   (a) *Large concentrated animal feeding operations* only

Sample Type	Analytical Parameter	Minimum Frequency	Sample Method
Manure, litter, and process waste water	(i) Total nitrogen (ii) Total phosphorus	Annually	Sample according to guidance contained in NRCS 590 or 633 practice standard.
Exported manure, litter, and process waste water	(i) Total nitrogen (ii) Total phosphorus	Annually	Sample according to guidance contained in NRCS 590 or 633 practice standard.
Soil from land application area(s)	(i) Total nitrogen (ii) Total phosphorus	Once every 5 years from all fields where manure, litter, or process waste water is applied.	Sample according to guidance contained in PNW 570-E, EM 8832-E, or NRCS 590 practice standard.

   (b) Other confined animal feeding operations

Sample Type	Analytical Parameter	Minimum Frequency	Sample Method
Soil from land application area(s)	(i) Total nitrogen (ii) Total phosphorus	Once every 5 years from all fields where manure, litter, or process waste water is applied.	Sample according to guidance contained in PNW 570-E, EM 8832-E, or NRCS 590 practice standard.

Note: In the event of any inconsistency between the monitoring requirements of this permit and NRCS 590, the monitoring requirements of this permit apply. The permittee should be aware that NRCS 590 monitoring frequencies may need to be followed to access or maintain federal funds.

S4.B. Inspection Requirements

1. The permittee must conduct the following inspections:

Item	Large Concentrated	Other Operations
(a) Stormwater diversion devices, runoff diversion structures, animal waste storage structures, and devices channeling contaminated storm water to the waste water and manure storage and containment structures.	Weekly and record results	Periodically
(b) Water lines, including drinking water or cooling water lines.	Daily and record results	Periodically
(c) Equipment used for land application of manure, litter, or process waste water	Daily when equipment is in use and record results	Periodically when equipment is in use
(d) Liquid impoundments for manure and process waste water	Weekly and record depth of manure and process waste water according to depth marker required by S2.E.3, p. 10	Periodically

2. Any deficiencies found as a result of these inspections must be corrected as soon as possible. The permittee with a *large concentrated animal feeding operation* must record any actions taken to correct these deficiencies and, if deficiencies are not corrected within 30 days, provide an explanation of the factors preventing immediate correction.

S4.C. Recordkeeping and Availability Requirements

1. The permittee must maintain all information required by this permit at the facility for at least five (5) years and make this information available to ODA upon request.
2. Upon obtaining permit coverage, must record the following information. (Note: If any of the following information is provided in the permittee's AWMP, a separate record keeping effort is not required.)

Item	Large Concentrated	Other Operations
(a) Date, amount, and nutrient loading of manure, litter, or process waste water applied to each field.	Required	Required
(b) Weather conditions at the time of application and 24 hours before and after application.	Required	Not required
(c) Total amount of nitrogen and phosphorus actually applied annually to each field, including documentation of calculations of the total amount applied.	Required	Required
(d) Total amount of manure or waste water transferred or exported to other persons.	Required. Also include: (i) Date and amount of each transfer or export (ii) Name and address of each recipient (iii) Copy of the manure nutrient analysis conducted provided to the recipient [see S2.K.3, p. 11	Required
(e) Description of actions taken to correct deficiencies discovered during inspections.	Required (see S4.B.2, p. 17)	Not required

S4.D. Reporting Requirements

1. 24-hour Reporting
   (a) If a discharge to surface water or groundwater occurs that is not allowed by Condition S2.B and S2.C, p. 9, the permittee must notify ODA within 24 hours of the discharge. The permittee must submit a written report within five (5) days to ODA. The information to be submitted is listed in the monitoring requirements (see S4.A, p. 16 above) of this permit.
   (b) The permittee must report to ODA within 24 hours of becoming aware of any significant physical failure at any time of a waste water control facility required under this permit.
   (c) The permittee must notify ODA within 24 hours of any permit noncompliance that may endanger health or the environment as described in G2.6, p. 20.

2. Annual Report
   (a) The permittee must submit an annual report to ODA by March 15 of each year. The annual report must include the following for the previous calendar year:
      (i) Maximum number and type of animals approved by ODA in the permittee's *Notice of Registration*, whether in open confinement or housed under roof (e.g,, beef cattle, broilers, layers, swine weighing 55 pounds or more, swine weighing less than 55 pounds, mature dairy cows, dairy heifers, veal calves, sheep and lambs, horses, ducks, turkeys, other).
      (ii) Actual number of animals by type at the CAFO averaged over the year.
      (iii) Estimated amount of total manure, litter, process waste water and other material that comes into contact with manure generated by the CAFO (tons, gallons, cubic feet, or cubic yards).
      (iv) Estimated amount of total manure, litter, process waste water and other material transferred to other persons by the permittee (tons, gallons, cubic feet, or cubic yards).
      (v) Estimated amount of manure, bedding, litter, process waste water, and other material that comes in contact with manure applied to land by the permittee (tons, gallons, cubic feet, or cubic yards).
      (vi) Total number of acres for land application covered by the AWMP developed in accordance with the terms of this permit.
      (vii) Total number of acres under control of the permittee that were used for land application of manure, litter and process waste water.
      (viii) Summary of all manure, litter and process waste water discharges from the production area that have occurred, including date, time and approximate volume.
      (ix) A statement indicating whether the AWMP was developed or approved by a certified waste management planner.
      (x) As required by 40 CFR §122.42(e)(4)(viii), the concentrated animal feeding operation that discharges or proposes to discharge to waters of the U.S. must also report the following:
         (1) Actual crop(s) planted and actual yield(s) for each field.
         (2) Actual nitrogen and phosphorus content of the manure, litter, and process waste water.
         (3) Data used and results of calculations based on protocol in the ODA-approved AWMP.
         (4) Amount of manure litter, and process waste water applied to each field during the previous 12 months.
         (5) Results of soil testing for nitrogen and phosphorus if testing was performed.
         (6) Amount of any supplemental fertilizer applied.

   (b) The annual report must be signed and certified by the permittee or permittee's authorized representative with the following statement: "*I certify, under penalty of law, that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations*."

S4.E. Additional Monitoring

1. ODA may establish specific monitoring requirements in addition to those contained in this permit by administrative order. An administrative order is an agency action expressed in writing directed to a named person or named persons (ORS 183.310).

2. If a permittee experiences two or more discharges within a 24-month period that are not associated with a 25-year, 24-hour or greater rainfall event, ODA may require surface water and/or groundwater quality monitoring or transfer the permittee to an individual permit. Monitoring for the following parameters may be required: bacteria, total suspended solids, total Kjeldahl nitrogen, biochemical oxygen demand, and other nutrient indicators. If ODA waives the additional monitoring requirements because such monitoring would be impracticable or not likely to produce useful information, ODA will set out the basis for the decision in writing and make the decision available to interested parties.

GENERAL CONDITIONS

G1. Noncompliance reporting requirements

1. If for any reason, the permittee does not comply with, or will be unable to comply with any of the requirements or conditions specified in the permit, the permittee must, at a minimum, provide ODA with the following information:
   (a) A description of the nature and cause of noncompliance, including the quantity and quality of any unauthorized waste discharges;
   (b) The period of noncompliance, including exact dates and times, and the anticipated time when the permittee will return to compliance; and
   (c) The steps taken, or to be taken to reduce, eliminate, and prevent recurrence of the noncompliance.
2. In addition, the permittee must take immediate action to stop, contain, and clean up any unauthorized discharges and take all reasonable steps to minimize any adverse impacts to waters of the state and correct the problem. The permittee must notify ODA by telephone so that an investigation may be made to evaluate any resulting impacts and the corrective actions taken to determine if additional action should be taken.
3. Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or resulting liability for failure to comply

G2. Additional reporting requirements [40 CFR §122.41(1)]

1. *Planned changes*. The permittee shall give notice to the director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
   (a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in §122.29(b); or
   (b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under §122.42(a)(1).
   (c) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
2. *Anticipated noncompliance*. The permittee shall give advance notice to the director of any planned changes the permitted facility or activity which may result in noncompliance with permit requirements.
3. *Transfers*. This permit is not transferable to any person except after notice to the director. The director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Clean Water Act (See §122.61; in some cases, modification or revocation and reissuance is mandatory.)
4. *Monitoring reports*. Monitoring results must be reported at the intervals specified elsewhere in this permit.
   (a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the director for reporting results of monitoring of sludge use or disposal practices.
   (b) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring must be included in the calculation and reporting of the data submitted in the CMR or sludge reporting form specified by the director.
   (c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified by the director in the permit.
5. *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.
6. *Twenty-four hour reporting*.
   (a) The permittee shall report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission must also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been

corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(b) The following must be included as information which must be reported within 24 hours under this paragraph.
   (i) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See §122.41(g) or condition G16, p. 23.)
   (ii) Any upset which exceeds any effluent limitation in the permit. (See §122.41(n) or condition G17, p. 24.)
   (iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the director in the permit to be reported within 24 hours. (See §122.44(g).)

(c) The director may waive the written report on a case-by-case basis for reports under paragraph G2.6(b) of this section if the oral report has been received within 24 hours.

7. *Other noncompliance*. The permittee shall report all instances of noncompliance not reported under paragraphs G2.4, 5, and 6 of this section, at the time monitoring reports are submitted. The reports must contain the information listed in paragraph G2.6 of this section.
8. *Other information*. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

G3. Duty to comply [40 CFR §122.41(a)]

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

1. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
2. The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
3. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000.

Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.

G4. Compliance with other laws and statutes

Nothing in the permit will be construed as excusing the permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G5. Property rights [40 CFR §122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

G6. Duty to reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit or renewal permit. The application must be submitted at least 180 days before the expiration date of this permit. The director may grant permission in writing to submit an application less than 180 days in advance but no later than the permit expiration date.

G7. Need to halt or reduce activity not a defense [40 CFR §122.41(c)]

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

G8. Duty to mitigate [40 CFR §122.41(d)]

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

G9. Proper operation and maintenance [40 CFR §122.41(e)]

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

G10. Permit actions

1. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. [40 CFR §122.41(f)]
2. After notice, registration under this permit may be modified or revoked as it applies to any person for cause as follows:
   (a) Violation of any terms or conditions of the permit,
   (b) Failure of the permittee to disclose fully all relevant facts, or misrepresentations of any relevant facts by the permittee during the permit issuance process and during the life of the permit;
   (c) Failure to pay permit fees required by Oregon Administrative Rule when due;
   (d) Information indicating that the permitted operation poses a threat to human health or welfare;
   (e) A change in ownership or control of the operation, or
   (f) Other causes listed in 40 CFR §122.62 and 122.63.
3. Modification or revocation of coverage under this permit as it applies to any person may be initiated by ODA.
4. Issuance of coverage under an individual permit may be initiated by ODA in accordance with condition S1.F Individual Permit Coverage, p. 7.

G11. Change of Ownership or Control

The permittee must notify ODA in writing thirty (30) days prior to a change in facility ownership or control.

G12. Duty to provide information [40 CFR §122.41(h)]

The permittee shall furnish to the director, within a reasonable time, any information which the director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine

compliance with this permit. The permittee shall also furnish to the director upon request, copies of records required to be kept by this permit.

G13. Inspection and entry [40 CFR §122.41(i)]

The permittee shall allow the director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or state law, any substances or parameters at any location.

G14. Monitoring and records [40 CFR §122.41(j)]

1. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.
2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which must be retained for a period of at least five years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the director at any time.
3. Records of monitoring information must include:
   (a) The date, exact place, and time of sampling or measurements;
   (b) The individual(s) who performed the sampling or measurements;
   (c) The date(s) analyses were performed;
   (d) The individual(s) who performed the analyses;
   (e) The analytical techniques or methods used; and
   (f) The results of such analyses.
4. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 unless another method is required under 40 CFR subchapters N or O.
5. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

G15. Signatory requirement [40 CFR §122.21(k)]

1. All applications, reports, or information submitted to the director shall be signed and certified. (See §122.22)
2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

G16. Bypass [40 CFR §122.41(m)]

1. *Definitions*.
   (a) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.
   (b) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2. *Bypass not exceeding limitations*. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs G17.3 and 4 of this section.
3. *Notice*
   (a) *Anticipated bypass*. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
   (b) *Unanticipated bypass*. The permittee shall submit notice of an unanticipated bypass as required in paragraph G2.6 of this section (24-hour notice).
4. *Prohibition of bypass*.
   (a) Bypass is prohibited, and the director may take enforcement action against a permittee for bypass, unless:
      (i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      (ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
      (iii) The permittee submitted notices as required under paragraph G16.3 of this section.
   (b) The director may approve an anticipated bypass, after considering its adverse effects, if the director determines that it will meet the three conditions listed above in G16.4(a) of this section.

G17. Upset [40 CFR §122.41(n)]

1. *Definition*. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph G17.3 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
3. *Conditions necessary for a demonstration of upset*. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   (a) The upset occurred and that the permittee can identify the cause(s) of the upset;
   (b) The permitted facility was at the time being properly operated; and
   (c) The permittee submitted notice of the upset as required in paragraph G2.6(b)(ii) of this section (24 hour notice).
   (d) The permittee complied with any remedial measures required under paragraph G8 of this section.
4. *Burden of proof*. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

REFERENCES

PUBLICATIONS AND SOFTWARE

Crop Fertilizer Recommendations

Nutrient Requirements for Dairy Cattle 7th Ed, 2001 Natl. Research Council
http://www.nap.edu/openbook.php?isbn=0309069971

OSU EM8978-E, June 2009 (w. of Cascades); PNW615, 2010 (e. of Cascades)
http://extension.oregonstate.edu/catalog/details.php?sortnum=0134&name=Fertilizer+Guides

Extension Service Publications

Field Corn, Eastern Oregon-East of the Cascades, FG 71, January 2000
http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20643/fg71-e.pdf

Manure Application Rates for Forage Production, OSU EM 8585-E, July 2007
http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20536/em8585-e.pdf

Monitoring Soil Nutrients Using a Management Unit Approach, PNW 570-E, October 2003, *http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20762/pnw570-e.pdf*

Post-Harvest Soil Nitrate Testing for Manured Croppings Systems, EM 8832-E, May 2003, *http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20221/em8832-e.pdf*

Silage Corn, Western Oregon, EM 8978-E, June 2009
http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20610/em8978-e.pdf

Soil Test Interpretation Guide, OSU EC 1478, August 1999
http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/22023/ec1478.pdf

Feed Management

Feed Management, A tool for balancing nutrients on dairies and other livestock operations, EM 8913-E, July 2006
http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/20501/em8913-e.pdf

Manure Application Setback Features/Distances

CAFO General Permit #1
http://oregon.gov/ODA/NRD/docs/pdf/cafo_gnlpmt.pdf

Manure Nutrient Availability

Waste Utilization Jobsheet 633 OR-JS, Oregon USDA-NRCS, May 2003
http://efotg.sc.egov.usda.gov/references/public/OR/633js042707.pdf

REFERENCES

Phosphorus Assessment

Agronomy Technical Note No. 26: The Phosphorus Index, Oregon NRCS, June 2008
ftp://ftp-fc.sc.egov.usda.gov/OR/Technical_Notes/Agronomy/Agronomy26.pdf

Agricultural Phosphorus Management Using the Oregon/Washington Phosphorus Indexes, *http://eesc.orst.edu/agcomwebfile/edmat/em8848-e.pdf*

Practice Standards

Oregon NRCS Nutrient Management Standard (590), July 2013
http://efotg.sc.egov.usda.gov/references/public/OR/590std_OR-July2013.pdf

Oregon NRCS Waste Recycling Standard (633), July 2013
http://efotg.sc.egov.usda.gov/references/public/OR/633std_OR-July11.pdf

Record Keeping

Online Decision making And Record Keeping, March 2015
http://www.odark.org

Oregon ODA CAFO Recordkeeping Calendar, January 2015
http://www.oregon.gov/ODA/NRD/pages/cafoprogdocs.aspx

Water Quality/Quantity

Oregon NRCS Water Quality Technical Note No. 1: Water Quality Indicator Tools, October 2000
ftp://ftp-fc.sc.egov.usda.gov/OR/Technical_Notes/Water%20Quality/WaterQual01.pdf

Software

Revised Universal Soil Loss Equation, RUSLE2 version 1.26.6.4, October 2006
http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm

Oregon Animal Waste Management Planning Tool, ORAWMv5.0, June 2014
http://www.oregon.gov/ODA/NRD/pages/cafoprogdocs.aspx

Online Decision making And Record Keeping, March 2015
http://www.odark.org

REFERENCES

ORAWM WORKBOOK

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: Bonanza View Dairy

ASSISTED BY: Bruce D. Wilson, H&R Engineering LLC

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

ANIMAL INVENTORY

Type of Animal	Number of Animals	Average Weight (lbs.)	Animal Units (1,000 lb.)	Milk Production in Pounds/Cow/Day= 70 — Nutrient Production (lbs./day/1000 lb. Animal Unit) N	P	K	Nutrient Production (lbs./day) N	P	K	Manure CF/D/AU	Annual Days Confined	Annual Days Grazed	Annual Days Off Farm
MILKER (Holstein)	995	1,300	1,293.5	0.70	0.12	0.32	905.45	155.48	416.25	1.70	365	0	0
MILKER (DRY)	300	1,400	420.0	0.30	0.04	0.10	126.00	17.64	42.00	0.92	365	0	0
HEIFERS (12-24 Months)	2,010	700	1,407.0	0.27	0.05	0.12	374.26	64.02	168.84	0.90	365	0	0
CALVES (1-12 Months)	1,280	200	256.0	0.42	0.05	0.11	107.52	13.82	28.16	1.34	365	0	0
Totals/Averages-	4,585	900	3,376.5	0.45	0.07	0.19	1,513.2	251.0	655.2	1.2			

GRAZING PERIOD

Type of Animal	Percent of Month and Number of Animals Grazing OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	AU-YR.
MILKER (Holstein)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	995	995	995	995	995	995	995	995	995	995	995	995	0
MILKER (DRY)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	300	300	300	300	300	300	300	300	300	300	300	300	0
HEIFERS (12-24 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	2010	2010	2010	2010	2010	2010	1508	1005	1005	1005	1005	1508	0
CALVES (1-12 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	1280	0
													0
													0
													0
													0
													0
Total AUM's Available>	0	0	0	0	0	0	0	0	0	0	0	0	0
Total AUM's Needed>>>	0	0	0	0	0	0	0	0	0	0	0	0	0
Total AUM's>>>>>>>>>>	0	0	0	0	0	0	0	0	0	0	0	0	0

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: Bonanza View Dairy

ASSISTED BY: Bruce D. Wilson, H&R Engineering LLC

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION KLAMATH FALLS AG-STN

Month	25Yr-24Hr	2.40	Lot Runoff Factors as a Percent of Monthly Precipitation	
	RCN=	95.00		
	Average Monthly Inches			
	Precipitation	Evaporation	Paved	Unpaved
October	0.89	3.23	40%	10%
November	1.87	0.67	40%	10%
December	2.04	0.38	40%	10%
January	1.14	0.50	45%	15%
February	1.86	0.88	35%	10%
March	1.31	1.77	35%	10%
April	0.73	3.65	30%	10%
May	0.67	5.54	30%	5%
June	0.63	6.53	40%	5%
July	0.48	7.78	30%	0%
August	0.48	7.23	35%	5%
September	0.75	4.69	35%	10%
Annual	12.85	42.85		

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

Description of Runoff Area	Area in SF
Paved Lot Area >> Is paved lot scraped daily? (Y/N) NO	13,245
Unpaved Lot Area >>>	465,044
Roof Area >>>	108,464
Surface Area of Silage Storage Facility>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> Does Silage Seepage Drain to Storage Facility? (Y/N) NO	0
Total Runoff Area Contributing to Liquid Storage Facility>>>>>>>>>>>>>>>	586,753

WATER USE THAT ENTERS LIQUID STORAGE FACILITY

Type of Water Use	Number of Animals	Number of Washes per Day	Gallons of Water Used per Wash-Day	Total Water Use per Day, Gallons	Total Water Use per Day, Cubic Feet
Animal Washwater	995	0	0.00	0	0.0
Equipment Wash		2	3400.00	6800	909.1
Flushwater		0	0.00	0	0.0
Miscellaneous		2	1750.00	3500	467.9
Total>>				10300	1377.0

CROP DATA

Field Number	Acres	Crop	Percent Dry Matter (DM)	Yield Units	Target Yield	Nutrients Removed in Pounds per Acre: Nitrogen N	Phosphorous P_2O_5	Potassium K_2O
5, 16, 18, 19, 30	330.3	Barley/Oat/Pea Haylage	100%	Ton	5.00	265	80	108
5, 16, 18, 19, 30	330.3	Triticale/Wheat Haylage	100%	Ton	6.50	319	101	89
1, 2, 8, 43	228.6	Alfalfa Haylage	100%	Ton	6.00	312	47	165
Off Farm								
Total Acres-	558.9							

BonanzaViewDairyORAWMv5.0.xls

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

2/23/2015

Version 5.0

CLIENT: Bonanza View Dairy

ASSISTED BY: Bruce D. Wilson, H&R Engineering LLC

ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

BEDDING VOLUME

Type of Animal	Type of Bedding Facility	Bedding Material	Unit Weight Lbs/CF	Amount Needed Lbs/Day/AU	Volume CF/Day/AU	Total Volume CF/Day	Total Weight Lbs/Day
MILKER (Holstein)	Free Stall	Composted Manure	36.00	0.00	0.00	0	0
MILKER (DRY)	Free Stall	Composted Manure	36.00	0.00	0.00	0	0
HEIFERS (12-24 Months)	Loose Housing	Composted Manure	36.00	0.00	0.00	0	0
CALVES (1-12 Months)	Confined	Loose Hay	4.13	2.60	0.63	161	666

SOLIDS SEPARATION FACTOR

Type of Animal	Type of Separator	% Solids Separated	Volume of Solids Separated CF/Day	Volume of Solids in Liquids CF/Day	Volume of Manure in Liquids CF/Day	Volume of Manure in Solids CF/Day	Accumulated Sludge in Storage CF/Day	Density of Separated Solids Lbs/CF	Weight of Separated Solids Lbs/Day
MILKER (Holstein)	Gravity Basin	50%	1,102	1,102	1,102	1,102	634	36	39,674
MILKER (DRY)	Gravity Basin	50%	193	193	193	193	50	36	6,955
HEIFERS (12-24 Months)	Dry Scrape System	75%	950	317	317	950	138	36	34,190
CALVES (1-12 Months)	Dry Scrape System	75%	378	126	86	257	29	36	13,613
Total Solids>>>			2,623	1,738	1,698	2,502	851		94,433

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

Month	Runoff in Cubic Feet: Roof Area Square Feet 108,464	Paved Slab Area Square Feet 13,245	Unpaved Lot Area Square Feet 465,044	Silage Pit Surface Area, SF 0	Facility Water Use Cubic Feet	Manure: Solids Cubic Feet	Manure: Liquids Cubic Feet	Bedding: Cubic Feet	Bedding: Pounds	Solids Separated: Cubic Feet	Solids Separated: Pounds	Solids in Liquids: Cubic Feet	Solids in Liquids: Pounds	Total Solids Cubic Feet	Total Liquids Cubic Feet
October	8,044	393	3,449	0	42,687	17,237	112,958	4,996	20,634	81,317	2,927,423	53,875	1,939,483	81,317	108,448
November	16,902	826	7,247	0	41,310	16,681	109,315	4,835	19,968	78,694	2,832,990	52,137	1,876,919	78,694	118,422
December	18,439	901	7,906	0	42,687	17,237	112,958	4,996	20,634	81,317	2,927,423	53,875	1,939,483	81,317	123,807
January	10,304	566	6,627	0	42,687	17,237	112,958	4,996	20,634	81,317	2,927,423	53,875	1,939,483	81,317	114,059
February	16,812	719	7,208	0	38,556	15,569	102,027	4,513	18,637	73,448	2,644,124	48,661	1,751,791	73,448	111,956
March	11,841	506	5,077	0	42,687	17,237	112,958	4,996	20,634	81,317	2,927,423	53,875	1,939,483	81,317	113,985
April	6,598	242	2,829	0	41,310	15,230	101,278	4,835	19,968	71,578	2,576,819	49,765	1,791,528	71,578	100,744
May	6,056	222	1,298	0	42,687	14,234	96,334	4,996	20,634	66,597	2,397,476	48,968	1,762,834	66,597	99,231
June	5,694	278	1,221	0	41,310	13,775	93,226	4,835	19,968	64,448	2,320,138	47,388	1,705,968	64,448	95,891
July	4,339	159	0	0	42,687	14,234	96,334	4,996	20,634	66,597	2,397,476	48,968	1,762,834	66,597	96,152
August	4,339	185	930	0	42,687	14,234	96,334	4,996	20,634	66,597	2,397,476	48,968	1,762,834	66,597	97,109
September	6,779	290	2,907	0	41,310	15,230	101,278	4,835	19,968	71,578	2,576,819	49,765	1,791,528	71,578	101,050
Annual	**116,147**	**5,286**	**46,698**	**0**	**502,607**	**188,137**	**1,247,960**	**58,824**	**242,944**	**884,806**	**31,853,010**	**610,116**	**21,964,165**	**884,806**	**1,280,854**
Annual Gallons	**868,779**	**39,538**	**349,302**	**0**	**3,759,500**	**1,407,268**	**9,334,740**	**440,005**		**6,618,348**		**4,563,665**		**6,618,348**	**9,580,784**

DAILY NUTRIENT PRODUCTION

Type of Animal	Pounds/Day of Nutrients from LIQUIDS: N	P_2O_5	K_2O	Pounds/Day of Nutrients from SOLIDS: N	P_2O_5	K_2O	Pounds/Day of Nutrients from GRAZING: N	P_2O_5	K_2O	Grazing Manure Gallons/Yr	Confined Manure Cubic Feet/Yr
MILKER (Holstein)	78.44	66.55	95.00	577.38	429.21	679.72	0.00	0.00	0.00	0	804,505
MILKER (DRY)	10.91	7.55	9.59	80.35	48.70	68.58	0.00	0.00	0.00	0	141,036
HEIFERS (12-24 Months)	16.21	13.70	19.27	357.99	265.09	413.57	0.00	0.00	0.00	0	365,346
CALVES (1-12 Months)	4.66	2.96	3.21	102.84	57.24	68.98	0.00	0.00	0.00	0	125,210
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
									Total-	**0**	**1,436,097**

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

Month	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Total Pounds of Nutrients from ALL SOURCES		
	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
October	3,417	2,814	3,939	34,675	24,807	38,156	0	0	0	38,092	27,621	42,095
November	3,307	2,723	3,812	33,557	24,007	36,925	0	0	0	36,863	26,730	40,738
December	3,417	2,814	3,939	34,675	24,807	38,156	0	0	0	38,092	27,621	42,095
January	3,417	2,814	3,939	34,675	24,807	38,156	0	0	0	38,092	27,621	42,095
February	3,086	2,541	3,558	31,320	22,407	34,464	0	0	0	34,406	24,948	38,022
March	3,417	2,814	3,939	34,675	24,807	38,156	0	0	0	38,092	27,621	42,095
April	3,185	2,620	3,668	30,875	22,021	33,827	0	0	0	34,060	24,641	37,495
May	3,166	2,601	3,640	29,127	20,699	31,746	0	0	0	32,292	23,300	35,387
June	3,063	2,517	3,523	28,187	20,031	30,722	0	0	0	31,250	22,548	34,245
July	3,166	2,601	3,640	29,127	20,699	31,746	0	0	0	32,292	23,300	35,387
August	3,166	2,601	3,640	29,127	20,699	31,746	0	0	0	32,292	23,300	35,387
September	3,185	2,620	3,668	30,875	22,021	33,827	0	0	0	34,060	24,641	37,495
Annual	**38,990**	**32,081**	**44,907**	**380,895**	**271,812**	**417,628**	**0**	**0**	**0**	**419,884**	**303,894**	**462,535**

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

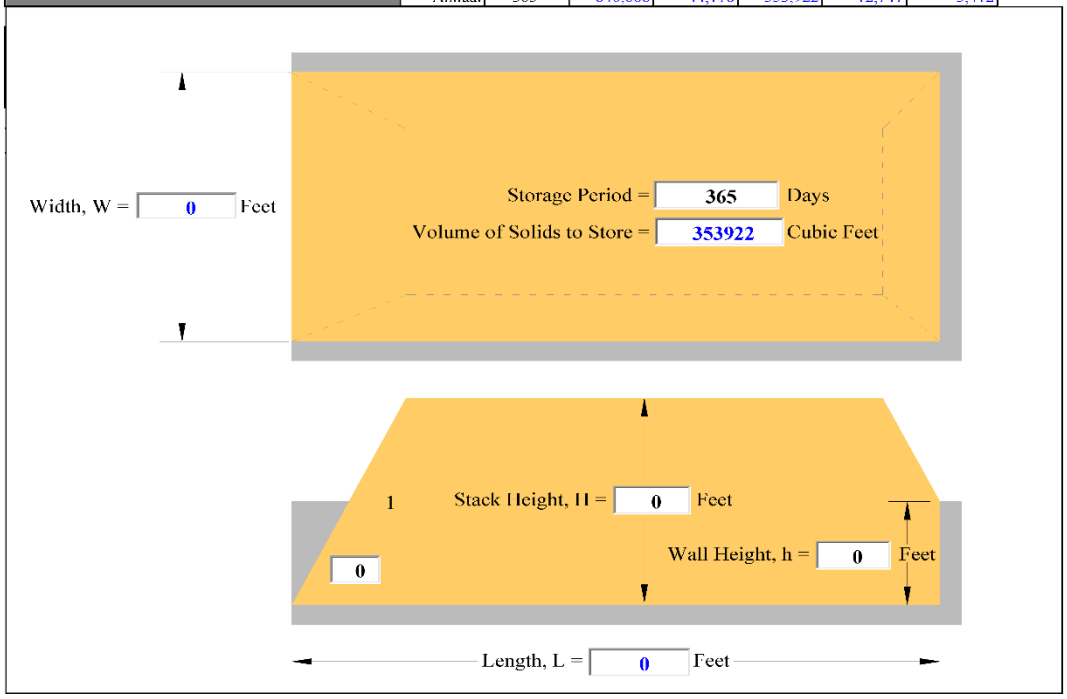
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

Solids Storage Facility Parameters	Value
Storage Period, Days=	365
Stacking Width, W in Feet=	0
Stacking Height, H in Feet=	0.00
Wall Height, h in Feet=	0.00
Stack Side Slope (X:1)=	0.00
Existing Storage, Cubic Feet=	1,735,398
Surface Area of Existing Storage, SF=	33,977
25 Year-24 Hour Storm Runoff, CF=	5,295
Volume Needed, Cubic Feet=	353,922
Design Volume, Cubic Feet=	0
Is Facility Covered?	NO
Volume Reduction Factor=	0.60

VOLUME OF MONTHLY SOLIDS STACKED IN FACILITY

Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Solids to Store Tons	Normal Runoff CF
October	31	77,570	3,747	32,527	1,171	252
November	30	75,068	3,626	31,478	1,133	529
December	31	77,570	3,747	32,527	1,171	578
January	31	77,570	3,747	32,527	1,171	484
February	28	70,063	3,384	29,379	1,058	527
March	31	77,570	3,747	32,527	1,171	371
April	30	67,952	3,626	28,631	1,031	207
May	31	62,850	3,747	26,639	959	95
June	30	60,822	3,626	25,779	928	89
July	31	62,850	3,747	26,639	959	0
August	31	62,850	3,747	26,639	959	68
September	30	67,952	3,626	28,631	1,031	212
Annual	365	840,688	44,118	353,922	12,741	3,412



BonanzaViewDairyORAWMv5.0.xls

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

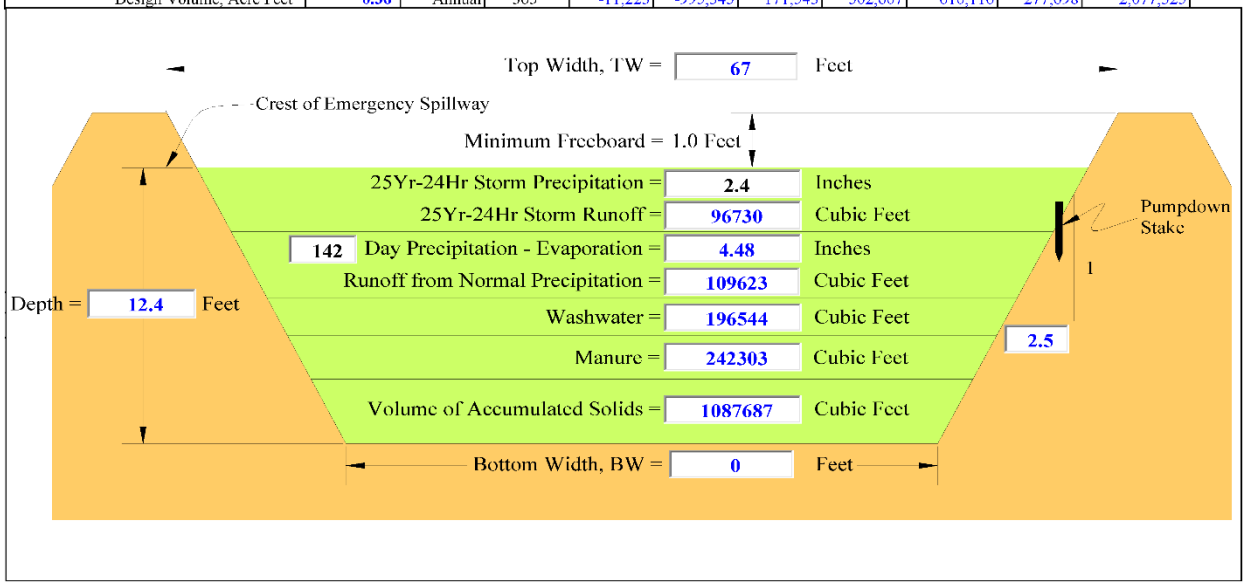
2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

WASTEWATER STORAGE POND — **MONTHLY INFLOWS INTO WASTEWATER STORAGE POND**

Pond Parameters	Value	Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Solids CF	Waste to Store CF	Waste to Store Gallons
Storage Period, Days=	142	October	31	-875	-77,637	12,138	42,687	53,875	82,813	619,487
Side Slope (X:1)=	2.50	November	30	449	39,814	25,504	41,310	52,137	210,142	1,571,969
Bottom Width, BW, Feet=	0	December	31	621	55,076	27,823	42,687	53,875	232,707	1,740,768
Bottom Length, BL, Feet=	0	January	31	239	21,234	17,981	42,687	53,875	188,642	1,411,140
Accumulated Solids Duration, Years=	4	February	28	367	32,515	25,265	38,556	48,661	192,896	1,442,964
Existing Storage, Acre Feet=	44.85	March	31	-172	-15,262	17,794	42,687	53,875	151,548	1,133,654
Surface Area of Existing Storage, SF=	398,138	April	30	-1,092	-96,880	9,876	41,310	49,765	51,534	385,500
Minimum Soil Liner Depth, Feet=	1.00	May	31	-1,822	-161,578	7,671	42,687	48,968	-16,355	-122,346
25 Year-24 Hour Storm Runoff, CF=	96,730	June	30	-2,207	-195,751	7,282	41,310	47,388	-55,798	-417,401
Top Width, TW, Feet=	67	July	31	-2,731	-242,201	4,498	42,687	48,968	-101,061	-755,986
Top Length, TL, Feet=	67	August	31	-2,525	-223,953	5,522	42,687	48,968	-81,582	-610,278
Volume Needed, Acre Feet=	45.21	September	30	-1,474	-130,722	10,188	41,310	49,765	17,623	131,826
Design Volume, Acre Feet=	0.36	Annual	365	-11,223	-995,345	171,543	502,607	610,116	277,698	2,077,325



BonanzaViewDairyORAWMv5.0.xls

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation / Type of Storage Facility	Pounds of Nutrients Available N	Pounds of Nutrients Available P2O5	Pounds of Nutrients Available K2O	Percent Nutrients Retained After Storage N	Percent Nutrients Retained After Storage P2O5	Percent Nutrients Retained After Storage K2O	Pounds of Nutrients Retained After Storage N	Pounds of Nutrients Retained After Storage P2O5	Pounds of Nutrients Retained After Storage K2O
	Dairy									
Liquids	Storage Pond Manure Analysis	38,990	32,081	44,907	65%	95%	95%	25,343	30,477	42,661
Solids	Solids Storage Manure Analysis	380,895	271,812	417,628	95%	90%	90%	361,850	244,631	375,865
Grazing	NONE	0	0	0	100%	100%	100%	0	0	0

NUTRIENTS AVAILABLE AFTER APPLICATION

Nutrient Source	Type of Application System	Pounds of Nutrients Available N	Pounds of Nutrients Available P2O5	Pounds of Nutrients Available K2O	Percent Nutrients Retained After Application N	Percent Nutrients Retained After Application P2O5	Percent Nutrients Retained After Application K2O	Pounds of Nutrients Retained After Application N	Pounds of Nutrients Retained After Application P2O5	Pounds of Nutrients Retained After Application K2O
Liquids	Sprinkling	25,343	30,477	42,661	65%	100%	100%	16,473	30,477	42,661
Solids	Broadcast (Incorporated 7 or more days after application)	361,850	244,631	375,865	65%	100%	100%	235,202	244,631	375,865
Grazing	Grazing	0	0	0	85%	100%	100%	0	0	0

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location / Soil Drainage Class	Pounds of Nutrients Available N	Pounds of Nutrients Available P2O5	Pounds of Nutrients Available K2O	Percent Nutrients Retained After Denitrification N	Percent Nutrients Retained After Denitrification P2O5	Percent Nutrients Retained After Denitrification K2O	Pounds of Nutrients Retained After Denitrification N	Pounds of Nutrients Retained After Denitrification P2O5	Pounds of Nutrients Retained After Denitrification K2O
	East of Cascade Mountains									
Liquids	Well Drained	16,473	30,477	42,661	94%	100%	100%	15,485	30,477	42,661
Solids	Well Drained	235,202	244,631	375,865	94%	100%	100%	221,090	244,631	375,865
Grazing	Well Drained	0	0	0	94%	100%	100%	0	0	0
							TOTAL-	***236,575***	***275,108***	***418,526***

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

Version 5.0

2/23/2015

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

PERCENT OF MANURE TO BE APPLIED TO FIELD AND UTILIZATION ACRES NEEDED BASED ON NITROGEN, N

Field Number	Acres	Crop	LIQUIDS			SOLIDS			GRAZING		
			Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients	Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients	Percent to be Applied	Pounds of Nutrients to be Applied	Acres Needed for Utilization of Nutrients
5, 16, 18, 19, 30	330.3	Barley/Oat/Pea Haylage	33%	5,133	19	33%	73,288	277	33%	0	0
5, 16, 18, 19, 30	330.3	Triticale/Wheat Haylage	40%	6,169	19	40%	88,084	277	40%	0	0
1, 2, 8, 43	228.6	Alfalfa Haylage	27%	4,183	13	27%	59,719	191	27%	0	0
Off Farm			0%	0		0%	0		0%	0	
TOTALS-	558.9		100%	15,485	52	100%	221,090	745	100%	0	0

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED			- NUTRIENTS REMOVED			= NUTRIENT BALANCE		
			Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre	Nitrogen, N Lbs/Acre	Phosphorous, P_2O_5 Lbs/Acre	Potassium, K_2O Lbs/Acre
5, 16, 18, 19, 30	330.3	Barley/Oat/Pea Haylage	237	276	420	265	80	108	-28	196	312
5, 16, 18, 19, 30	330.3	Triticale/Wheat Haylage	285	332	505	319	101	89	-33	231	416
1, 2, 8, 43	228.6	Alfalfa Haylage	280	325	495	312	47	165	-32	278	330
Off Farm											

REFERENCES

REFERENCES

OREGON ANIMAL WASTE MANAGEMENT DESIGN AID (ORAWM)

2/23/2015

Version 5.0

CLIENT: **Bonanza View Dairy**
ASSISTED BY: **Bruce D. Wilson, H&R Engineering LLC**

Vegetated Treatment Area Worksheet

Climatic Station-	KLAMATH FALLS AG-STN			
25 year-24 hour Storm-	2.40	Inches		
Runoff Curve Number-	95			
25 year-24 hour Storm Runoff-	1.87	Inches		
Runoff Area-	2,861,892	SF		
25 year-24 hour Storm Runoff-	3,335,917	Gallons		
Max Application to VTA-	0.50	Inches		
VTA Crop-	Barley/Oat/Pea Haylage		Yield-	4.5 Tons/Acre
Nutrients Utilized-	N=	239 lbs/Acre		
	P_2O_5=	72 lbs/Acre		
	K_2O=	98 lbs/Acre		
Available Nutrients in Runoff-	N=	2.70 lbs/1,000 Gallons		
	P_2O_5=	1.00 lbs/1,000 Gallons		
	K_2O=	8.60 lbs/1,000 Gallons		
Nutrients Entering VTA-	N=	9,007 lbs		
	P_2O_5=	3,336 lbs		
	K_2O=	28,689 lbs		
Area Needed to Utilize Nutrients-	N=	1,645,048 SF	or	37.77 Acres
	P_2O_5=	2,013,573 SF	or	46.23 Acres
	K_2O=	12,803,523 SF	or	293.93 Acres
Area Needed for Runoff=		2,321,520 SF	or	53.29 Acres

REFERENCES