ANIMAL WASTE MANAGEMENT PLAN
MALLORIES DAIRY

MALLORIES DAIRY
P.O. Box 618
Silverton, OR 97381

RECEIVED
FEB 11 2005
NATURAL RESOURCES DIVISION

MA# 172211
Plan# 04208
Due 3/28/2005

OWNER:
Mallorie Family
P.O. Box 618
Silverton, OR 97381
503-873-5346

signed R.W. Mallorie Pres. 2-11-05
Date

Prepared by :
Northwest Agricultural Consulting
Tom Thomson
1275 Oak Villa Road
Dallas, OR 97338
503-623-0468

ARCPACS
TOM THOMSON
CERTIFIED PROFESSIONAL SOIL SCIENTIST
NO. 24781 EXP. 12-31-05

signed 2-10-05
Date

Original AWMP November 2000
Revised January 31, 2005

INDEX

Signature Page
- a) Contact name, address, phone number:
- b) Facility address

1. General Information
   - a) Location information
   - b) Purpose of Plan

2. Annual Status Review
   - a) Narrative
   - b) Spreadsheet data

3. ORAWM

4. Cropping

5. Manure and Wastewater System Narrative

6. Limitations to Manure Applications

7. Irrigation system

8. Maps
   - a) Aerial view of dairy and management areas
   - b) Topography and Water Features map
   - c) Fields and Risers map
   - d) Headquarters layout map
   - e) Soils map and soils percentages

9. Soils Information

10. Phosphorus Index by Field

11. Operations and Maintenance

12. Monitoring and Testing Protocols
   - a) Manure testing
   - b) Soil Testing
   - c) Crop nutrient removal

13. Animal Mortality Plan

14. Recordkeeping and Reporting Requirements

15. Additional Requirements of Large Federal CAFOs

16. Amendment to the AWMP

LOCATION:
Mallories Dairy is located at the above address approximately 3 miles northwest of Silverton, OR. The dairy facilities are located on Taxlot 23676 in Section 32 and 33, T6S, R1W, WM in Marion County, Oregon.

Mallories Dairy is a 2900 cow dairy (1570 milker, 350 dry cow, 700 heifer, and 250 calf and 30 bulls). The cows are housed in freestall barns bedded with composted sawdust-manure, or in loose-housed barns bedded with sawdust or straw. The new barn has a flush system and the older barns are tractor scraped. Most of the animals are confined on concrete year round. All the milk generated on the dairy is processed on the dairy for retail sales. All animals are fed a total mixed ration that includes some home grown forage, with the balance of the ration imported feedstuffs.

The Mt. Angel heifer facility houses about 500-600 animals ranging in age from two and one half to six months old. There are three man barns and all pens are bedded with sawdust. Pens are pushed out periodically and the manure, both solid and liquid, is hauled back to the main dairy for composting into freestall bedding.

The dairy separates manure solids from the manure stream while the liquid portion is directed to the 136 acre-foot waste pond which affords 200 days of storage. 100% of the separated solids are removed from the farm. The solid manure storage facility has 365 days of storage capacity. The manure system was designed to prevent or minimize degradation of soil, water, air, plant, and animal resources and to protect public health and safety. The system was also planned to preclude discharge from a 25-year 24-hour precipitation event, to minimize groundwater contamination and to recycle the waste produced though the soil and crop system to the fullest extent possible.

Pond supernatant is applied via fixed risers and traveling guns as needed. Irrigation data is maintained on charts which detail date, location, inches applied, and manure type for each set.

The cropped acreage between fields on the upper and lower terraces of the Pudding River drainage. The 411 cropped acres are divided into 9 fields. Much feed is purchased from other sources to supplement the harvested crops and create a nutritionally balanced feed.

The Dairy plants a winter cover crop of annual ryegrass after the corn harvest, which is harvested in the spring for silage. Silage corn is planted as soon as practical after the grass harvest and harvested in the fall. The goal of the dairy is balancing the nutritive value of the feed produced with the necessity of nutrient uptake and cycling within the system.

PURPOSE:

Mallories Dairy has had a CAFO Plan on file with the Oregon Department of Agriculture (ODA) for many years. The main purpose of this plan revision was to update the current plan information and to provide new information, as necessary, to meet the Minimum Required Elements (MRE) of CAFO plans for the new General CAFO Permit issued by the ODA.

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET

Version 1.8

3/8/2005
STATE: OREGON

CLIENT: Mallories Dairy - Current Herd
ASSISTED BY: Northwest Ag Consulting - Tom Thomson
CHECKED BY:

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= 85 — 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
MILKER	1,570	1,250	1,962.5	0.65	0.10	0.34	1269.15	194.97	675.68	1.75	365	0
MILKER (DRY)	350	1,350	472.5	0.36	0.05	0.23	170.10	23.63	108.68	1.10	365	0
HEIFERS (12-24 Months)	200	1,200	240.0	0.31	0.04	0.24	74.40	9.60	57.60	1.30	365	0
HEIFERS (12-24 Months)	550	350	192.5	0.31	0.04	0.24	59.68	7.70	46.20	1.30	365	0
CALVES (1-12 Months)	250	100	25.0	0.31	0.04	0.24	7.75	1.00	6.00	1.30	365	0
~~BEEF COW~~ Bulls	30	1,500	45.0	0.33	0.12	0.26	14.85	5.40	11.70	1.00	365	0
Totals/Averages-	2,950	958	2,937.5	0.54	0.08	0.31	1,595.9	242.3	905.9	1.6		

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	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	1570	0
MILKER (DRY)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	350	350	350	350	350	350	350	350	350	350	350	350	0
HEIFERS (12-24 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	200	200	200	200	200	200	200	200	200	200	200	200	0
HEIFERS (12-24 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	550	550	550	550	550	550	550	550	550	550	550	550	
CALVES (1-12 Months)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	250	250	250	250	250	250	250	250	250	250	250	250	0
~~BEEF COW~~ Bulls	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	30	30	30	30	30	30	30	30	30	30	30	30	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

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ANIMAL WASTE MANAGEMENT SYSTEM INVENTORY

WEATHER STATION   SILVERTON 4 SE

	25Yr-24Hr	4.00	Lot Runoff Factors as a Percent of Monthly Precipitation	
	Monthly Average in Inches			
Month	Precipitation	Evaporation	Paved	Unpaved
October	3.33	1.80	100%	15%
November	6.94	0.80	100%	20%
December	7.38	0.45	100%	15%
January	6.27	0.51	100%	20%
February	5.03	0.85	100%	15%
March	5.16	1.65	100%	10%
April	3.47	2.52	100%	10%
May	2.80	3.94	100%	10%
June	1.81	4.56	100%	10%
July	0.80	5.69	100%	0%
August	1.10	5.19	100%	10%
September	2.12	3.54	100%	15%
Annual	46.21	31.5		

AREAS CONTRIBUTING RUNOFF TO LIQUID STORAGE FACILITY

Description of Runoff Area	Area in SF
Paved Lot Area >>> Is paved lot scraped daily? (Y/N) YES	26,000
Unpaved Lot Area >>>	43,000
Roof Area >>>	40,000
Surface Area of Silage Storage Facility>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>> Does Silage Seepage Drain to Storage Facility? (Y/N) YES	20,000
Total Runoff Area Contributing to Liquid Storage Facility>>>>>>>>>>>>>>>>>	129,000

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	1570.0	3	0.04	188	25.2
Equipment Wash		3	333.33	1000	133.7
Flushwater		3	6000.00	18000	2406.4
Miscellaneous				0	0.0
Total>>				19188	2565.3

CROP DATA

Field Number	Acres	Crop	Condition	Yield Units	Target Yield	Nutrients Removed in Pounds per Acre: Nitrogen N	Phosphorous P_2O_5	Potassium K_2O
All	260.0	Ryegrass Haylage	As Harvested	Ton	12.50	313	115	321
All	260.0	Corn, Silage(AH)	As Harvested	Ton	25.00	193	100	230
Hayfield	140.0	Orchard Grass Hay/Pasture	DHM	Ton	14.00	745	276	314
Off-Farm								

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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	Free Stall	Sawdust	**12.00**	**3.10**	**0.33**	648	6,084
MILKER (DRY)	Loose Housing	Sawdust	**12.00**	**3.10**	**0.33**	156	1,465
HEIFERS (12-24 Months)	Confined	Sawdust	**12.00**	**3.10**	**0.26**	62	744
HEIFERS (12-24 Months)	Free Stall	Sawdust	**12.00**	**3.10**	**0.26**	50	597
CALVES (1-12 Months)	Confined	Sawdust	**12.00**	**3.10**	**0.26**	6	78
~~BEEF COW~~ Bulls							

SOLIDS SEPARATION FACTOR

Type of Animal	Type of Separator	Separation Factor %	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	Static Inclined Screen with Drag Chain	**30%**	323	753	3,298	128	1,588	**36**	11,620
MILKER (DRY)	Dry Scrape System	**75%**	507	169	130	390	49	**36**	18,243
HEIFERS (12-24 Months)	Dry Scrape System	**75%**	281	94	78	234	23	**36**	10,109
HEIFERS (12-24 Months)	Dry Scrape System	**75%**	225	75	63	188	19	**36**	8,108
CALVES (1-12 Months)	Dry Scrape System	**100%**	39	0	0	33	0	**36**	1,403
~~BEEF COW~~ Bulls			0	5	45	0	11		0
Total Solids>>>			1,375	1,096	3,613	972	1,689		49,483

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ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY VOLUMES

	Runoff in Cubic Feet					Manure		Bedding		Solids Separated		Solids in Liquids		Total Solids	Total Liquids
Month	Roof Area Square Feet 40,000	Paved Slab Area Square Feet 26,000	Unpaved Lot Area Square Feet 43,000	Silage Pit Surface Area, SF 20,000	Facility Water Use Cubic Feet	Solids Cubic Feet	Liquids Cubic Feet	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Pounds	Cubic Feet	Cubic Feet
October	11,100	7,215	1,790	5,228	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	250,849
November	23,133	15,037	4,974	6,495	76,959	17,594	119,984	27,674	269,003	41,236	1,484,480	32,879	1,183,641	41,236	271,493
December	24,600	15,990	3,967	6,241	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	276,313
January	20,900	13,585	4,494	6,486	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	270,980
February	16,767	10,898	2,704	5,225	71,828	16,421	111,985	25,829	251,069	38,487	1,385,514	30,687	1,104,732	38,487	250,125
March	17,200	11,180	1,849	5,256	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	261,001
April	11,567	7,518	1,243	4,760	76,959	17,594	119,984	27,674	269,003	41,236	1,484,480	32,879	1,183,641	41,236	246,943
May	9,333	6,067	1,003	467	79,524	18,181	123,983	28,596	28,596	42,610	1,533,962	33,975	1,223,096	42,610	242,386
June	6,033	3,922	649	302	76,959	17,594	119,984	27,674	269,003	41,236	1,484,480	32,879	1,183,641	41,236	232,760
July	2,667	1,733	0	0	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	229,916
August	3,667	2,383	394	183	79,524	18,181	123,983	28,596	277,969	42,610	1,533,962	33,975	1,223,096	42,610	232,143
September	7,067	4,593	1,140	4,712	76,959	17,594	119,984	27,674	269,003	41,236	1,484,480	32,879	1,183,641	41,236	239,365
Annual	154,033	100,122	24,205	45,354	936,332	214,064	1,459,801	336,697	3,023,491	501,699	18,061,170	400,027	14,400,966	501,699	3,004,273

DAILY NUTRIENT PRODUCTION

	Pounds/Day of Nutrients from LIQUIDS			Pounds/Day of Nutrients from SOLIDS			Pounds/Day of Nutrients from GRAZING		
Type of Animal	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
MILKER	888.41	312.67	569.93	380.75	134.00	244.26	1,269.15	446.67	814.19
MILKER (DRY)	42.53	13.53	32.74	127.58	40.59	98.22	170.10	54.12	130.95
HEIFERS (12-24 Months)	18.60	5.50	17.35	55.80	16.50	52.06	74.40	21.99	69.41
HEIFERS (12-24 Months)	14.92	4.41	13.92	44.76	13.23	41.75	59.68	17.64	55.67
CALVES (1-12 Months)	0.00	0.00	0.00	7.75	2.29	7.23	7.75	2.29	7.23
~~BEEP COW~~ Bulls	14.85	12.37	14.10	0.00	0.00	0.00	14.85	12.37	14.10
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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ANIMAL WASTE MANAGEMENT SYSTEM PRODUCTION

MONTHLY NUTRIENT PRODUCTION

	Pounds of Nutrients from LIQUIDS			Pounds of Nutrients from SOLIDS			Pounds of Nutrients from GRAZING			Pounds of Nutrients going OFF-FARM			Total Pounds of Nutrients from ALL SOURCES		
Month	N	P_2O_5	K_2O	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	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
November	29,379	10,454	19,441	18,499	6,198	13,305	0	0	0	0	0	0	47,878	16,653	32,747
December	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
January	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
February	27,420	9,757	18,145	17,266	5,785	12,418	0	0	0	0	0	0	44,686	15,543	30,563
March	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
April	29,379	10,454	19,441	18,499	6,198	13,305	0	0	0	0	0	0	47,878	16,653	32,747
May	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
June	29,379	10,454	19,441	18,499	6,198	13,305	0	0	0	0	0	0	47,878	16,653	32,747
July	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
August	30,358	10,803	20,089	19,115	6,405	13,749	0	0	0	0	0	0	49,474	17,208	33,838
September	29,379	10,454	19,441	18,499	6,198	13,305	0	0	0	0	0	0	47,878	16,653	32,747
Annual	**357,445**	**127,196**	**236,535**	**225,069**	**75,413**	**161,882**	**0**	**0**	**0**	**0**	**0**	**0**	**582,514**	**202,609**	**398,417**

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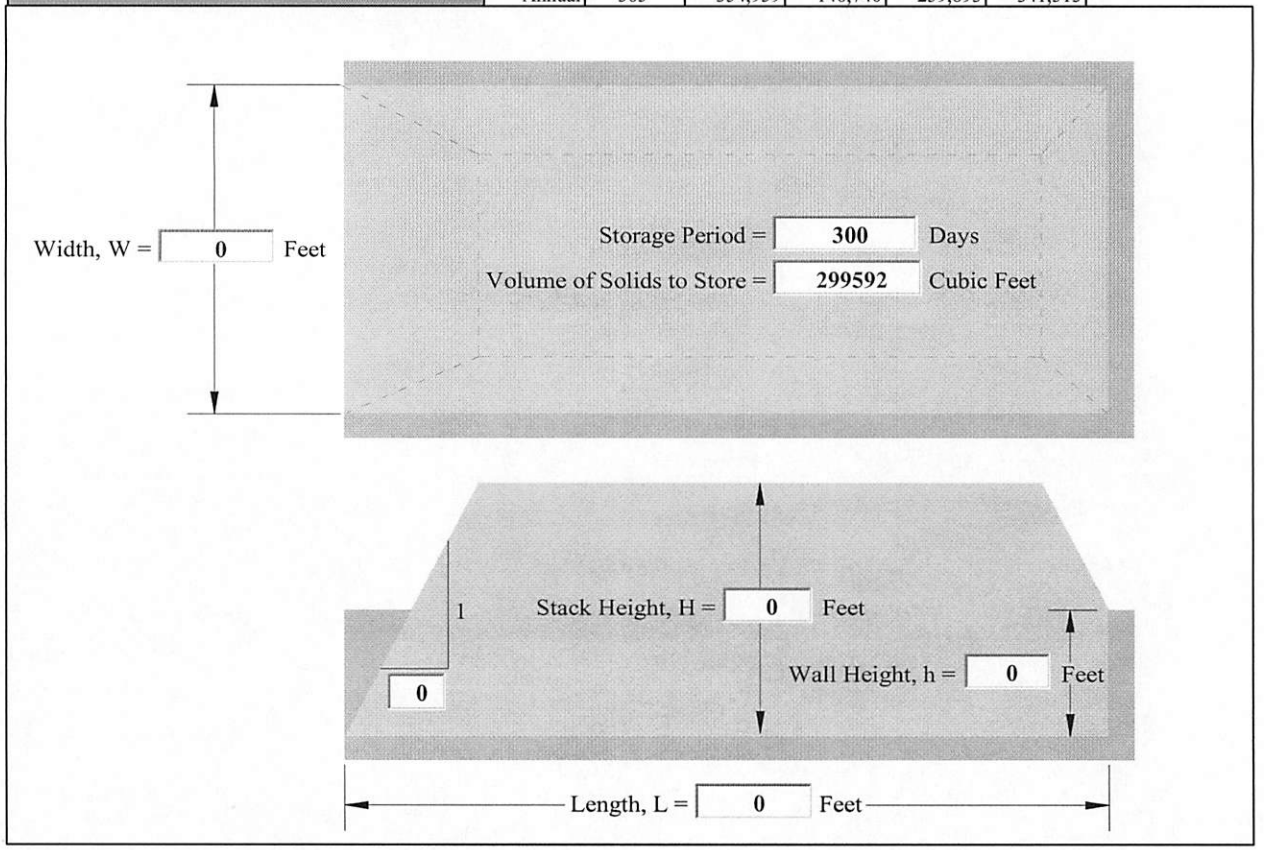
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

SOLIDS STACKING FACILITY

Solids Storage Facility Parameters	Value
Storage Period, Days=	300
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=	300,000
Surface Area of Existing Storage, SF=	20,000
25 Year-24 Hour Storm Runoff, CF=	6,667
Volume Needed, Cubic Feet=	299,592
Design Volume, Cubic Feet=	0
Is Facility Covered?	NO

MONTHLY SOLIDS VOLUME STACKED IN FACILITY

Month	Number of Days	Manure CF	Bedding CF	Solids to Store CF	Normal Runoff CF
October	31	30147	12,463	30,348	25,808
November	30	29175	12,061	20,618	69,400
December	31	30147	12,463	21,305	57,195
January	31	30147	12,463	21,305	64,790
February	28	27230	11,257	19,243	35,210
March	31	30147	12,463	21,305	26,660
April	30	29175	12,061	20,618	17,350
May	31	30147	12,463	21,305	14,467
June	30	29175	12,061	20,618	9,050
July	31	30147	12,463	21,305	0
August	31	30147	12,463	21,305	5,683
September	30	29175	12,061	20,618	15,900
Annual	365	354,959	146,740	259,893	341,513



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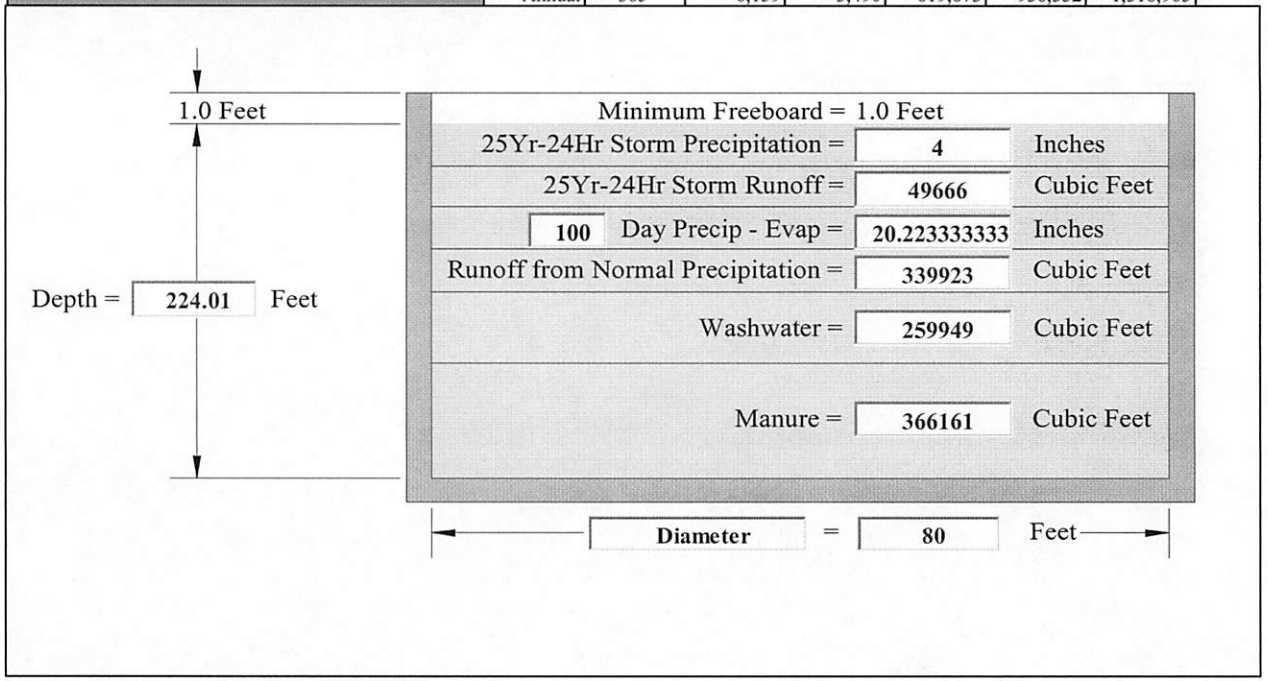
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

TANK

Tank Parameters	Value
Storage Period, Days=	**100**
Tank Diameter, Feet=	**80**
Existing Storage, Cubic Feet=	**44,454.00**
Surface Area of Existing Storage, SF=	**2,847**
25 Year-24 Hour Storm Runoff, CF=	**49,666**
Volume Needed, Cubic Feet=	**1,169,887**
Design Volume, Cubic Feet=	**1,125,426**
Is Tank Covered?	NO
Tank Dimensions?	Circular

MONTHLY INFLOWS INTO TANK

Month	Number of days	Rain-Evap on Tank CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Manure CF
October	31	641	363	45,912	79,524	112,017
November	30	2,571	1,457	112,544	76,959	108,403
December	31	2,901	1,644	101,752	79,524	112,017
January	31	2,412	1,367	103,769	79,524	112,017
February	28	1,750	992	65,579	71,828	101,176
March	31	1,470	833	56,889	79,524	112,017
April	30	398	225	37,678	76,959	108,403
May	31	-477	-270	30,870	79,524	112,017
June	30	-1,151	-652	19,654	76,959	108,403
July	31	-2,047	-1,160	4,400	79,524	112,017
August	31	-1,712	-970	12,128	79,524	112,017
September	30	-595	-337	28,700	76,959	108,403
Annual	365	6,159	3,490	619,873	936,332	1,318,905



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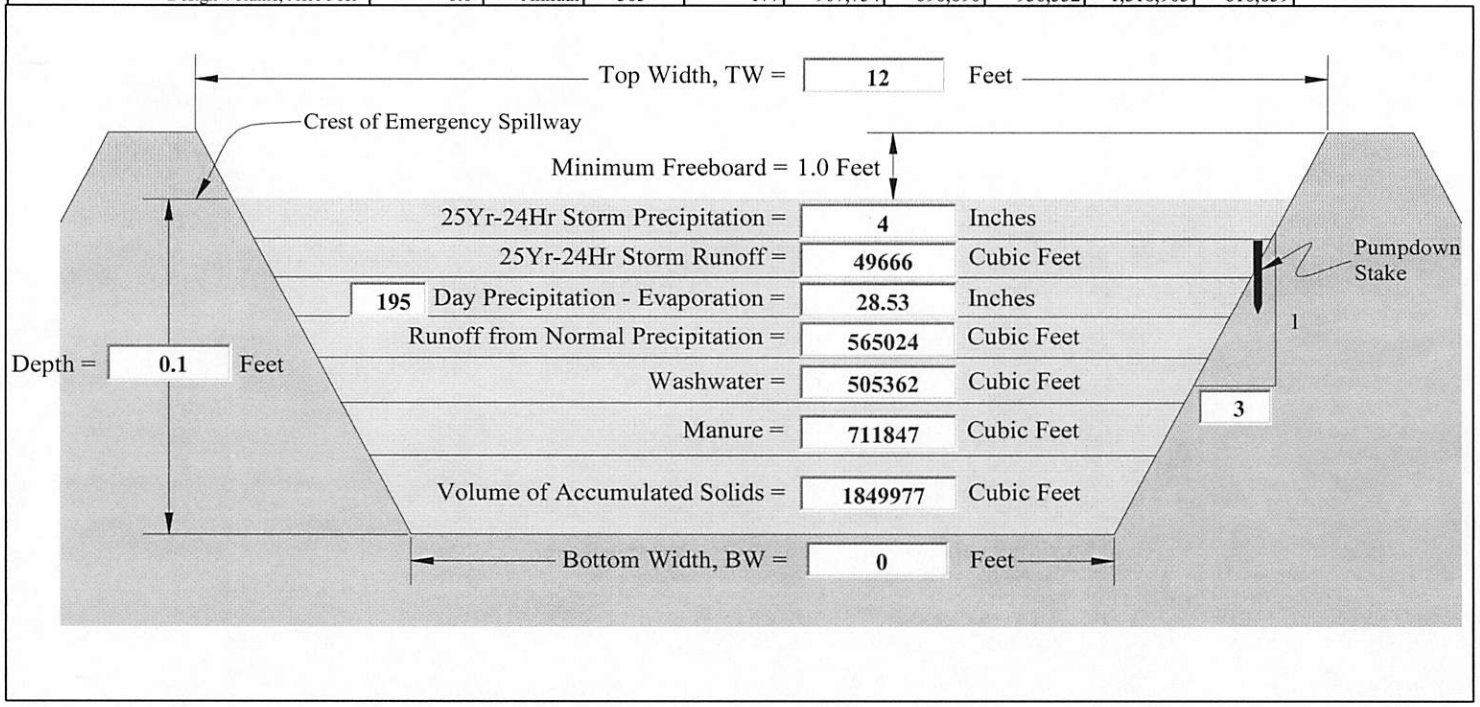
ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

WASTE STORAGE POND

Pond Parameters	Value
Storage Period, Days=	**195**
Side Slope (X:1)=	**3.00**
Bottom Width, BW, Feet=	**0**
Bottom Length, BL, Feet=	**0**
Accumulated Solids Duration, Years=	**3**
Existing Storage, Acre Feet=	**136.00**
Surface Area of Existing Storage, SF=	**740,520**
Minimum Soil Liner Depth, Feet=	**1.00**
25 Year-24 Hour Storm Runoff, CF=	**49,666**
Top Width, TW, Feet=	**12**
Top Length, TL, Feet=	**12**
Volume Needed, Acre Feet=	**135.0**
Design Volume, Acre Feet=	**0.0**

MONTHLY INFLOWS INTO WASTE STORAGE POND

Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Manure CF	Accum Solids CF
October	31	18	94,416	51,462	79,524	112,017	52,374
November	30	74	378,899	124,110	76,959	108,403	50,684
December	31	83	427,650	114,052	79,524	112,017	52,374
January	31	69	355,450	114,219	79,524	112,017	52,374
February	28	50	257,948	73,962	71,828	101,176	47,305
March	31	42	216,602	65,489	79,524	112,017	52,374
April	30	11	58,625	43,462	76,959	108,403	50,684
May	31	-14	-70,349	35,537	79,524	112,017	52,374
June	30	-33	-169,703	22,670	76,959	108,403	50,684
July	31	-59	-301,762	5,733	79,524	112,017	52,374
August	31	-49	-252,394	13,961	79,524	112,017	52,374
September	30	-17	-87,628	32,233	76,959	108,403	50,684
Annual	365	177	907,754	696,890	936,332	1,318,905	616,659



ANIMAL WASTE MANAGEMENT WORKSHEET

Version 1.8

CLIENT: **Mallories Dairy - Current Herd**
ASSISTED BY: **Northwest Ag Consulting - Tom Thomson** CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM STORAGE

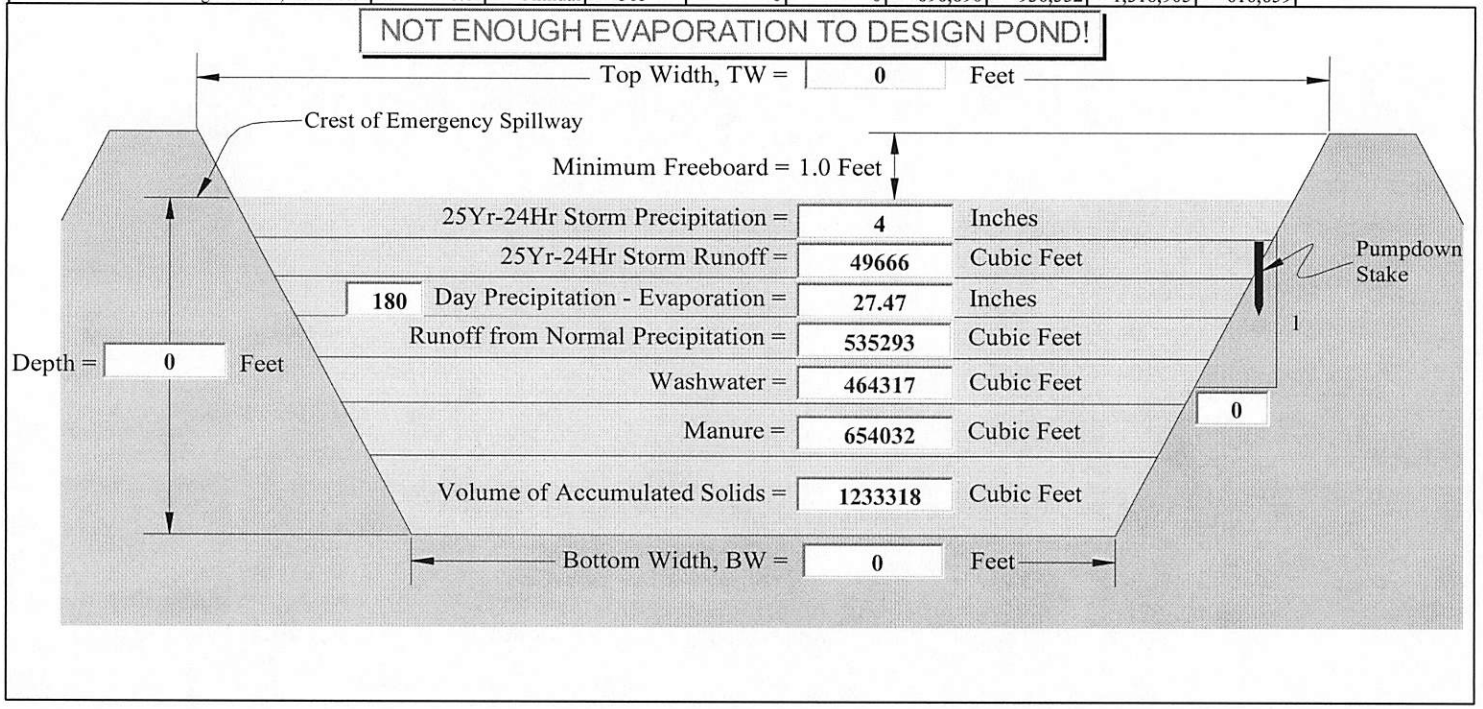
EVAPORATION POND

Evaporation Pond Parameters	Value
Storage Period, Days=	**180**
Side Slope (X:1)=	**0.00**
Bottom Width, BW, Feet=	**0**
Bottom Length, BL, Feet=	**0**
Accumulated Solids Duration, Years=	**2**
Existing Storage, Acre Feet=	**0.00**
Surface Area of Existing Storage, SF=	**0**
Minimum Soil Liner Depth, Feet=	**1.00**
25 Year-24 Hour Storm Runoff, CF=	**49,666**
Top Width, TW, Feet=	**0**
Top Length, TL, Feet=	**0**
Volume Needed, Acre Feet=	**117.0**
Design Volume, Acre Feet=	**0.0**

MONTHLY INFLOWS INTO EVAPORATION POND

Month	Number of Days	Rain-Evap on Pond CF	Rain-Evap on Existing Storage, CF	Normal Runoff CF	Washwater CF	Manure CF	Accum Solids CF
October	31	0	0	51,462	79,524	112,017	52,374
November	30	0	0	124,110	76,959	108,403	50,684
December	31	0	0	114,052	79,524	112,017	52,374
January	31	0	0	114,219	79,524	112,017	52,374
February	28	0	0	73,962	71,828	101,176	47,305
March	31	0	0	65,489	79,524	112,017	52,374
April	30	0	0	43,462	76,959	108,403	50,684
May	31	0	0	35,537	79,524	112,017	52,374
June	30	0	0	22,670	76,959	108,403	50,684
July	31	0	0	5,733	79,524	112,017	52,374
August	31	0	0	13,961	79,524	112,017	52,374
September	30	0	0	32,233	76,959	108,403	50,684
Annual	365	0	0	696,890	936,332	1,318,905	616,659

NOT ENOUGH EVAPORATION TO DESIGN POND!



U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET
Version 1.8

3/8/2005
STATE: OREGON

CLIENT: **Mallories Dairy - Current Herd**
ASSISTED BY: **Northwest Ag Consulting - Tom Thomson**
CHECKED BY:

ANIMAL WASTE MANAGEMENT SYSTEM UTILIZATION

NUTRIENTS AVAILABLE AFTER STORAGE

Nutrient Source	Type of Operation / Type of Storage Facility	Pounds of Nutrients Available			Percent Nutrients Retained After Storage			Pounds of Nutrients Retained After Storage		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Liquids	Dairy / Storage Pond (>50%) Dilution	357,445	127,196	236,535	40%	65%	80%	142,388	82,677	189,228
Solids	Dairy / Solids Storage Facility (Unroofed)	225,069	75,413	161,882	65%	80%	80%	146,295	60,331	129,505
Grazing	Dairy / NONE	0	0	0	100%	100%	100%	0	0	0

NUTRIENTS AVAILABLE AFTER APPLICATION

Nutrient Source	Type of Application System	Pounds of Nutrients Available			Percent Nutrients Retained After Application			Pounds of Nutrients Retained After Application		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Liquids	Sprinkling	142,388	82,677	189,228	75%	100%	100%	106,791	82,677	189,228
Solids	Broadcast (Incorporated 7 or more days after application)	146,295	60,331	129,505	70%	100%	100%	102,406	60,331	129,505
Grazing	Grazing	0	0	0	90%	100%	100%	0	0	0

NUTRIENTS AVAILABLE AFTER DENITRIFICATION

Nutrient Source	Location: Between Coastal and Cascade Mountains / Soil Drainage Class	Pounds of Nutrients Available			Percent Nutrients Retained After Denitrification			Pounds of Nutrients Retained After Denitrification		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
Liquids	Moderately Well Drained	106,791	82,677	189,228	87%	100%	100%	92,908	82,677	189,228
Solids	Moderately Well Drained	102,406	60,331	129,505	87%	100%	100%	89,094	60,331	129,505
Grazing	Moderately Well Drained	0	0	0	87%	100%	100%	0	0	0

U.S. Department of Agriculture
Natural Resources Conservation Service

ANIMAL WASTE MANAGEMENT WORKSHEET
Version 1.8

3/8/2005
STATE: OREGON

CLIENT: **Mallories Dairy - Current Herd**
ASSISTED BY: **Northwest Ag Consulting - Tom Thomson**
CHECKED BY:

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 Percent to be Applied	LIQUIDS Pounds of Nutrients to be Applied	LIQUIDS Acres Needed for Utilization of Nutrients	SOLIDS Percent to be Applied	SOLIDS Pounds of Nutrients to be Applied	SOLIDS Acres Needed for Utilization of Nutrients	GRAZING Percent to be Applied	GRAZING Pounds of Nutrients to be Applied	GRAZING Acres Needed for Utilization of Nutrients
All	260.0	Ryegrass Haylage	21%	19,511	62	0%	0	0	0%	0	0
All	260.0	Corn, Silage(AH)	32%	29,731	154	0%	0	0	0%	0	0
Hayfield	140.0	Orchard Grass Hay/Pasture	47%	43,667	59	0%	0	0	0%	0	0
0											
0											
0											
0											
0											
0											
Off-Farm			0%	0		100%	89,094		100%	0	
		TOTALS-	100%	92,908	276	100%	89,094	0	100%	0	0

0.21

NUTRIENT BALANCE BASED ON AVAILABLE ACRES

Field Number	Acres	Crop	NUTRIENTS APPLIED Nitrogen, N Lbs/Acre	NUTRIENTS APPLIED Phosphorous, P_2O_5 Lbs/Acre	NUTRIENTS APPLIED Potassium, K_2O Lbs/Acre	- NUTRIENTS REMOVED Nitrogen, N Lbs/Acre	- NUTRIENTS REMOVED Phosphorous, P_2O_5 Lbs/Acre	- NUTRIENTS REMOVED Potassium, K_2O Lbs/Acre	= NUTRIENT BALANCE Nitrogen, N Lbs/Acre	= NUTRIENT BALANCE Phosphorous, P_2O_5 Lbs/Acre	= NUTRIENT BALANCE Potassium, K_2O Lbs/Acre
All	260.0	Ryegrass Haylage	75	67	153	313	115	321	-237	-48	-168
All	260.0	Corn, Silage(AH)	114	102	233	193	100	230	-78	2	3
Hayfield	140.0	Orchard Grass Hay/Pasture	312	278	635	745	276	314	-433	2	321
0											
0											
0											
0											
0											
0											
Off-Farm											

CROPPING

The following table from the ORAWM Utilization Worksheet estimates the total annual NPK balance for this farming program of a winter cover crop of annual ryegrass, spring planted silage corn, and permanent orchardgrass fields which are cut for silage and hay.

NUTRIENT BALANCE BASED ON AVAILABLE ACRES (from ORAWM)

		NUTRIENTS APPLIED-			NUTRIENTS REMOVED=			NUTRIENT BALANCE		
Acres	Crop	N	P_2O_5	K_2O	N	P_2O5	K_2O	N	P_2O_5	K_2O
260.0	Ryegrass	76	67	155	313	115	321	-237	-47	-166
260.0	Corn Silage	115	102	235	193	100	230	-77	2	5
140.0	Orchardgrass	315	279	642	745	276	314	-430	4	329

The previous table is based upon 100% removal of all separated solids and liquid manure applied to the different crops based upon agronomic needs. The orchardgrass fields have a longer growing season and a greater nitrogen requirement and thus receive about 50% of the total liquid manure spread. Thus, for a herd size of 2950 animals, the dairy would balance for P and run a deficit of N for all crops and not need any additional cropland for manure utilization.

MALLORIES DAIRY – MANURE AND WASTEWATER SYSTEM

The current manure and wastewater system plan has been fully implemented to its current state. No further changes are anticipated. The current pond capacity gives the dairy approximately 200 day storage for manure and wastewater generated from the 2900 animals currently permitted. The solids storage facility has capacity for 365 days of storage. 2950

Manure systems have six main functions – Production, Collection, Transfer, Storage, Treatment, and Utilization of the solid and liquid components of the manure, milking parlor discharge, and surface waters that come in contact with the manure.

The cows are housed in large freestall barns. The new barn has a flush system while the older barns are scraped daily to a common reception pit. The flush system utilizes recycled lagoon water at periodic intervals. Manure is carried through pipes to a large uncovered 15 x 30 x 10 ft (4500 ft^3) rock trap/holding area which feeds two separators. The manure is pumped to three separators – one flat and two drag-chain sidehill - which extract approximately 30% of the manure solids. The separated solids are hauled by Mallorie trucks to Scott Company in Molalla, OR, or o local farmers. After separation the effluent empties into two settling basins, with the over flow going into the lagoon. All barns are guttered with the rainwater diverted to a buried tile near the road which drains along the road to the west and empties into the wetland in the NE corner of the Red field.

The holding pen, footbath, and parlor wastewater flow by gravity to the manure ponds.

The ponds are agitated and pumped prior to corn planting in the spring. The manure water stored in the pond is used to water the 420 cropped acres. A buried mainline system with risers services all of the cropped acreage. Big gun travelers and a new (2005) Reinke linear with drag hoses are used for irrigation.

MALLORIES DAIRY – LIMITATIONS TO MANURE APPLICATIONS

1.. According to ORAWM, all the cropped acreage is receiving less than agronomic rates for N and P_2O_5 when only liquid manure is utilized as a nutrient source. Dairy testing records show that ORAWM underestimates the removal rate of K_2O for the orchardgrass by approximately 540 lbs/A. Further testing will be documented to calculate the actual removal and uptake rates for all crops.

2. As can be seen from the Utilization Tables in ORAWM, the dairy is essentially balanced for P with the existing land base and animal numbers. The spring application of liquid manure which would be applied to the ryegrass haylage fields would suffice to promote greater growth. Since the timing of the applications would be predicated upon climatic factors previous to and at the time of application the potential for runoff or leaching would be minimized. Also, since the application would not be made until the crop was actively growing, coupled with the fact that cool season grasses, such as annual ryegrass, are heavy nitrogen users; the available nitrogen would be utilized by the crop immediately.

3. All of the riparian areas along Silver Creek and Pudding River have tree and brush growth within approximately 30 feet of the bank edge.

4. No manure applications are made from November through January of each year to the lower terrace soils to avoid runoff or leaching to the water. If, for some reason, emergency pumping is needed the soils of the upper terrace would be the only acceptable location. The ODA must be notified if emergency pumping is to occur.

5. The P-Index for each management area shows that the dairy can continue to manage for N instead of P. Annual soil tests of each management unit will allow the dairy to assess which units need additional P for optimum crop growth. As the above table shows, the dairy may need to purchase commercial fertilizer to achieve optimum yields and plant nutrition.

MALLORIES DAIRY – IRRIGATION SYSTEM

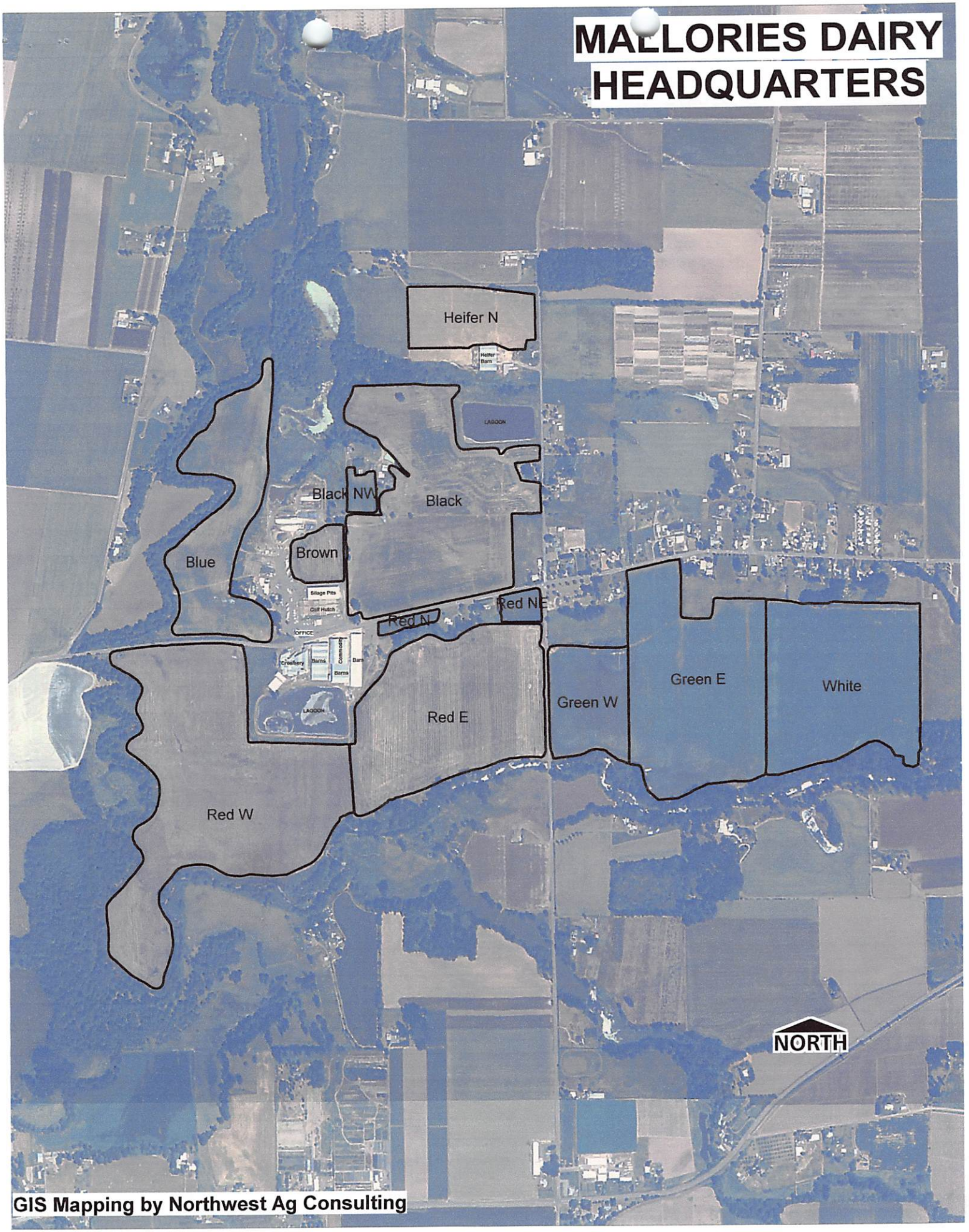
The irrigation system at Mallories Dairy consists of a 75 HP pump near the river and series of buried 6-inch diameter mainlines, risers, and valves with big gun travelers to irrigate with freshwater or liquid manure. Thus, any portion of the cropped acreage may receive freshwater, liquid manure, or a mix of the two. The dairy has irrigation rights to Silver Creek and Pudding River and normally use those rights each year. Irrigation timings are based upon crop need and experience.

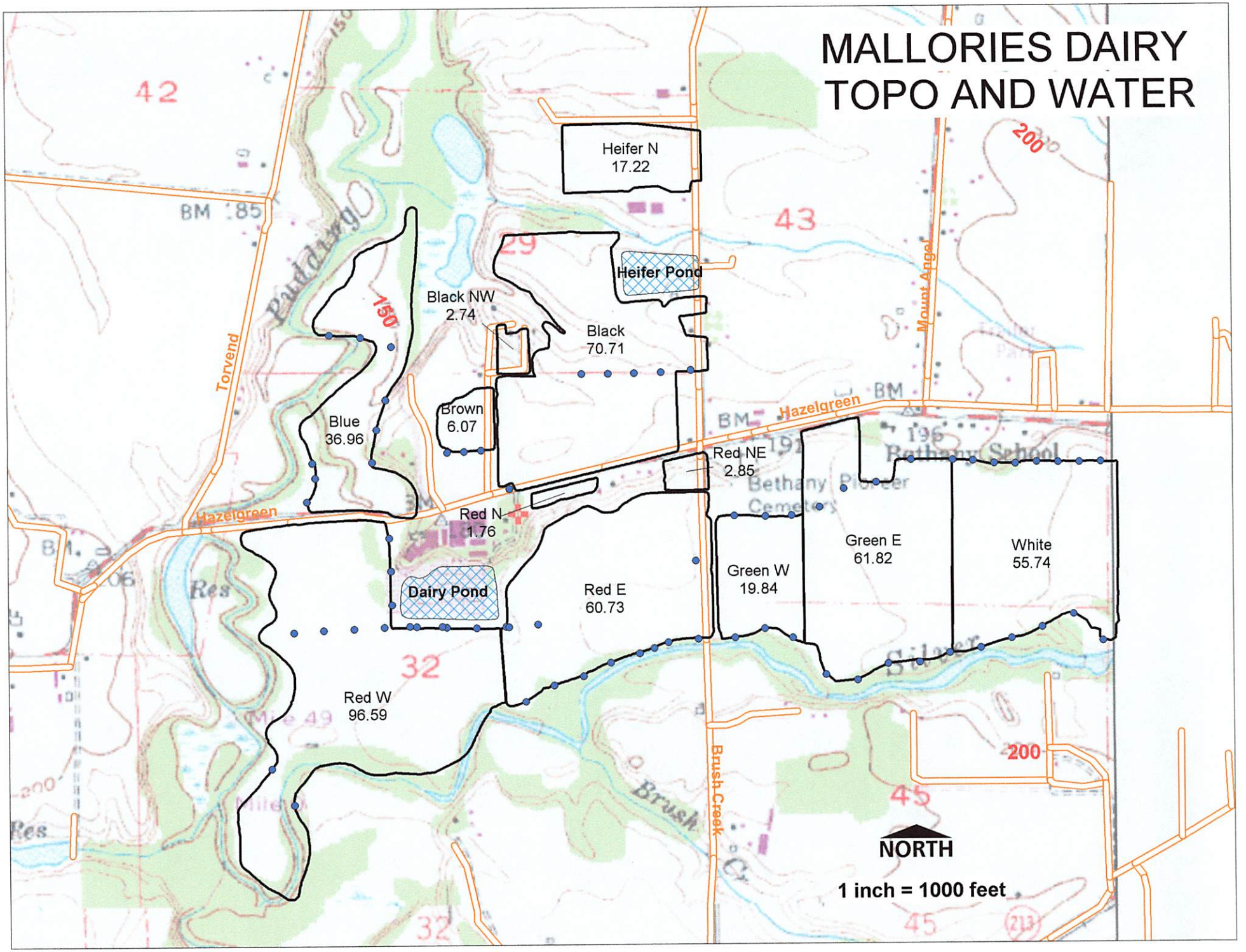
Irrigation water is applied via traveler-type systems. The six travelers with booster pumps to maintain pressure at the gun use Nelson 150 big gun sprinklers. Nozzle sizes and gun speed are varied to change the application rate based on the viscosity of the material being applied. The usual application is 1.5-2.0 inches per pull. Risers are spaced at 240 foot intervals. The dairy will be installing a new Reinke linear system with drag hoses to irrigate the eastern fields – Green and White. The linear will operate at about 95% efficiency conserving both water and nutrients as well as minimizing the odors associated with aerial applications of manure.

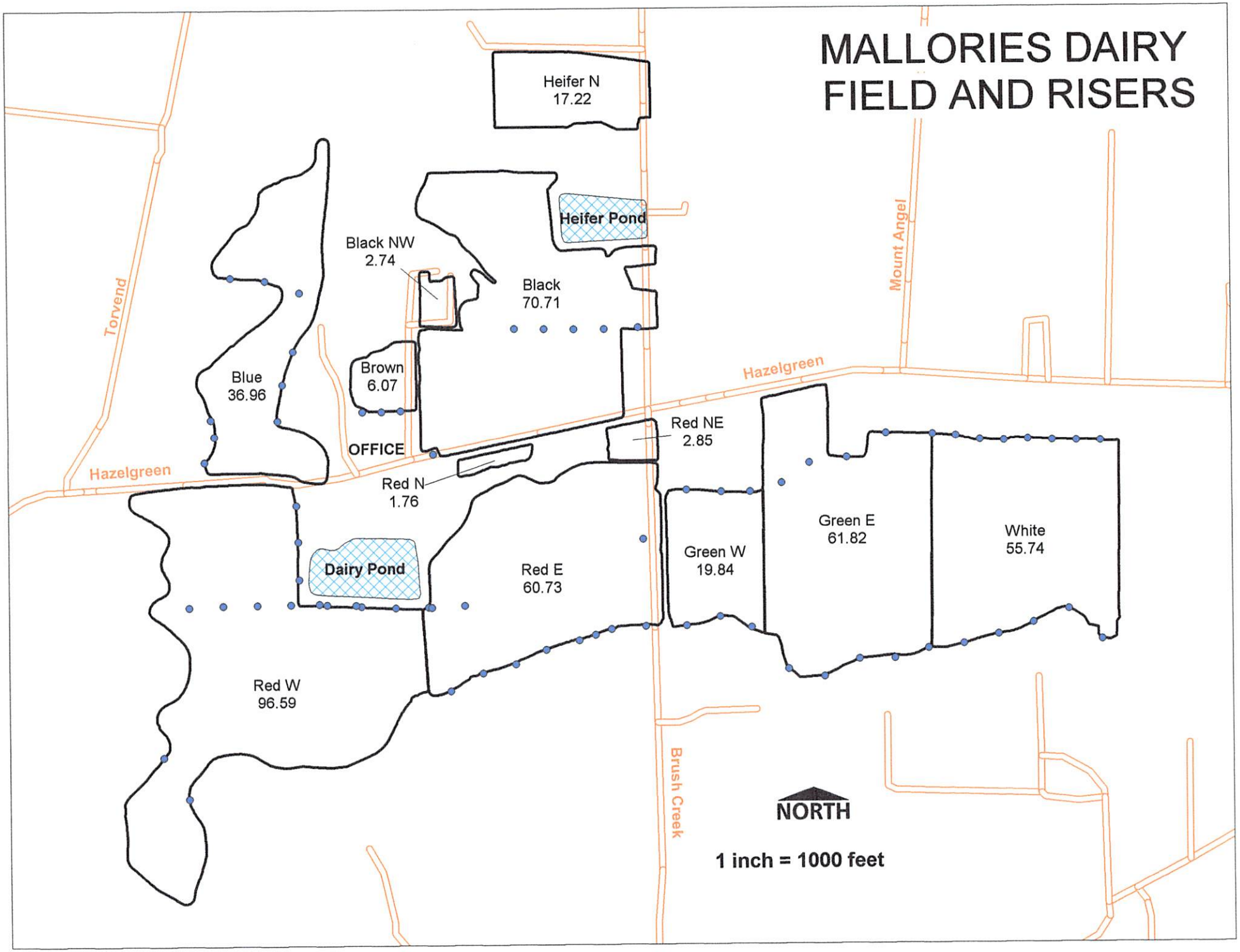
Applications of liquid manure and freshwater are recorded on a spreadsheet showing the date, location, manure type, inches applied for each pull. No runoff is observed to occur during these applications.

The annual ryegrass (ARG) cover crop and the orchardgrass crop usually receive a single application of liquid manure in mid-February or early March. The timing of the application is based upon field and weather conditions prior to the planned application. Climatic conditions prior to application necessitate no previous rainfall for the last two days and clear weather at the time of application coupled with no standing water in the field to which the liquid manure will be applied. The field conditions much be such that the traveler can be pulled into position in the field without causing severe crop damage from ruts and mud.

Prior to planting silage corn, the manure pond is agitated and 1.5-2.0 inches per acre of the agitated manure is pumped onto fields where the corn is to be planted. The corn will receive an application of unagitated liquid manure followed by two application of freshwater, then another liquid manure application followed by freshwater, etc until early September. Any further irrigations will be with freshwater. If pond volume is low, freshwater is pumped into the pond to maintain volume.

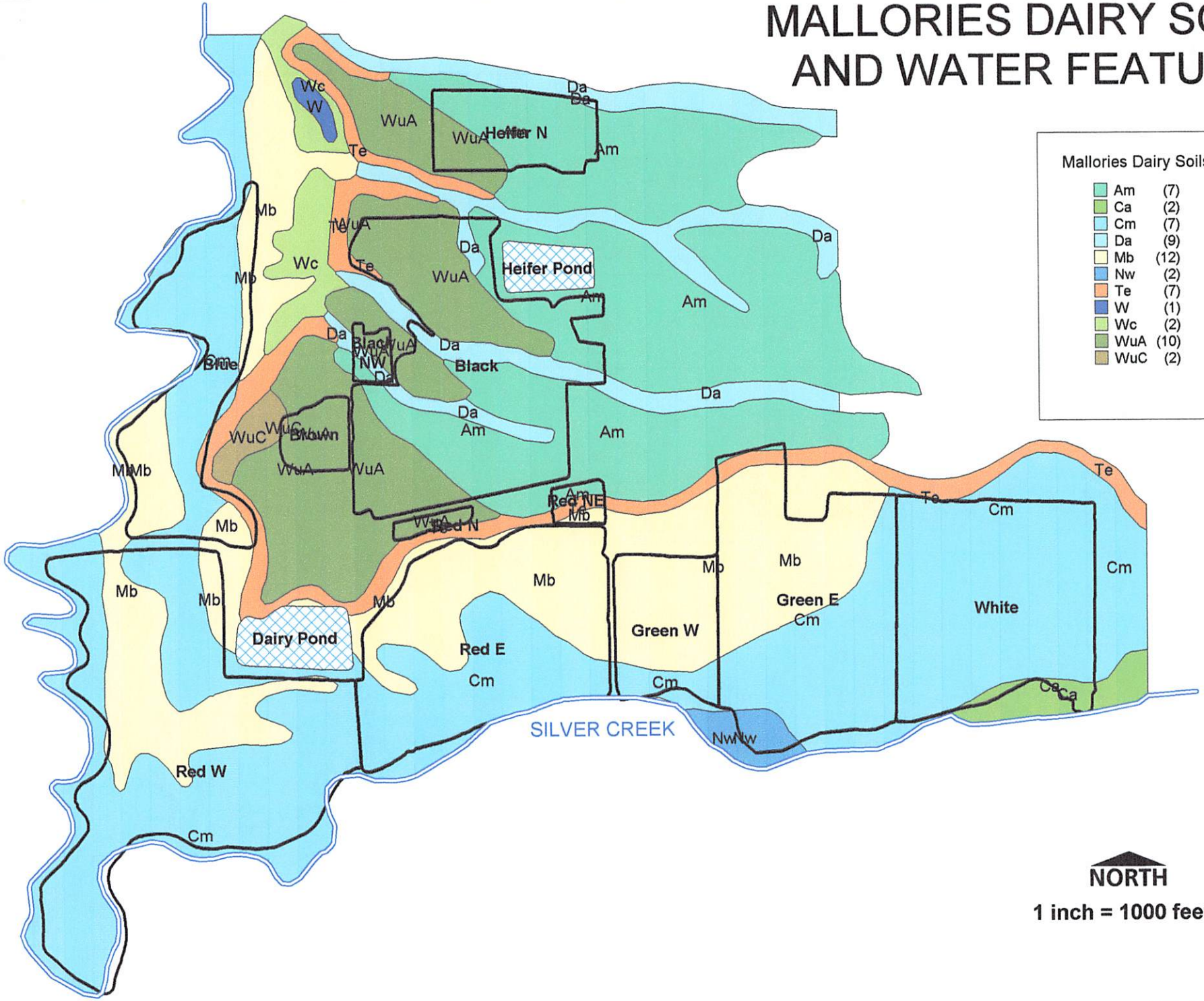

MALLORIES DAIRY
HEADQUARTERS
Heifer N
Heifer Barn
LAGOON
Black NW
Black
Brown
Blue
Silage Pits
Gulf Hutch
OFFICE
Creamery
Barns
Commodity
Barn
Barns
LAGOON
Red N
Red NE
Red E
Red W
Green W
Green E
White
NORTH
GIS Mapping by Northwest Ag Consulting


MALLORIES DAIRY
TOPO AND WATER
Heifer N
17.22
Heifer Pond
Black NW
2.74
Black
70.71
Brown
6.07
Blue
36.96
Red NE
2.85
Red N
1.76
Dairy Pond
Red E
60.73
Green W
19.84
Green E
61.82
White
55.74
Red W
96.59
Hazelgreen
Torvend
Mount Angel
Brush Creek
Bethany School
Bethany Pioneer Cemetery
NORTH
1 inch = 1000 feet

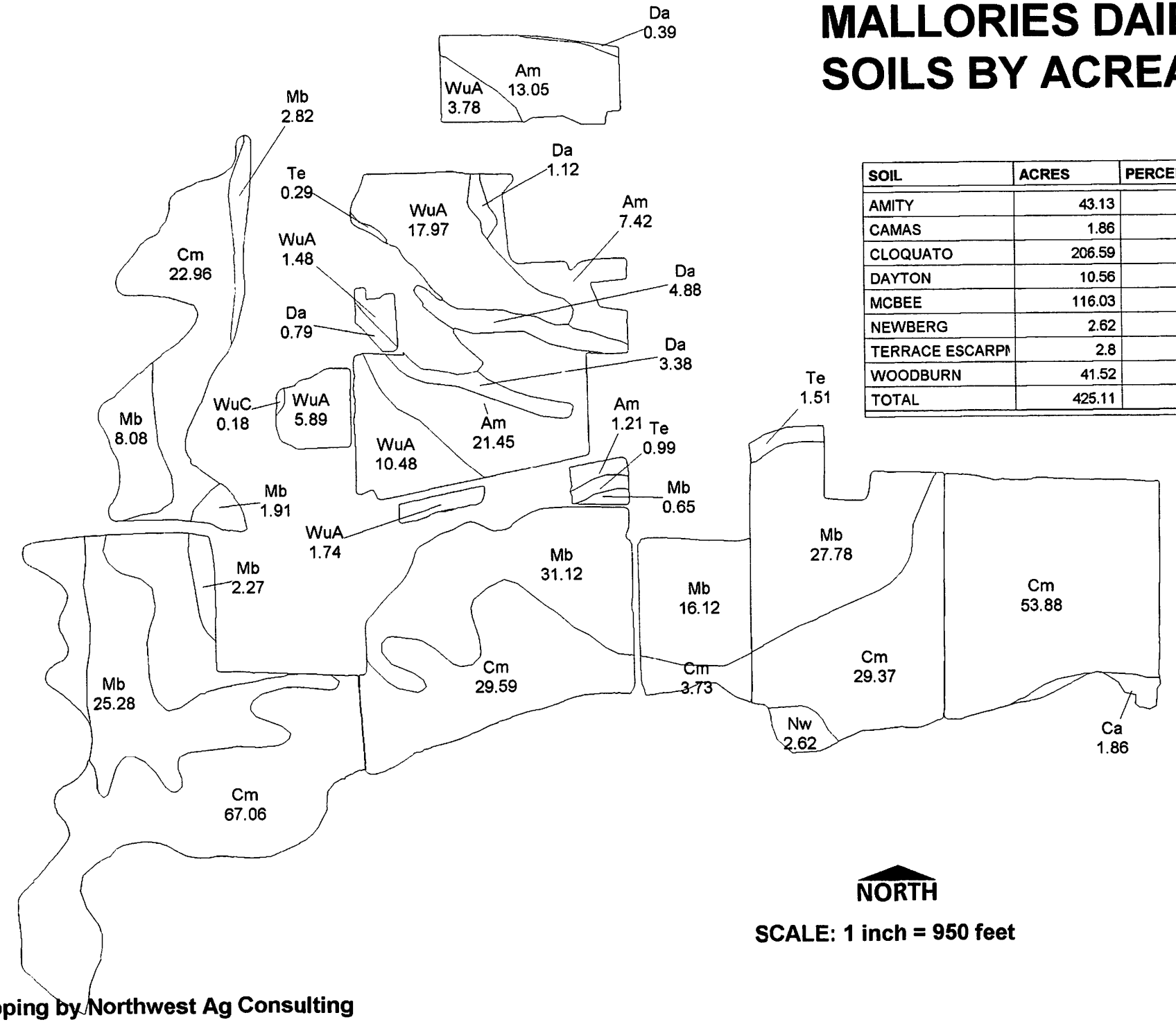

MALLORIES DAIRY
FIELD AND RISERS
Heifer N
17.22
Heifer Pond
Black NW
2.74
Black
70.71
Torvend
Mount Angel
Blue
36.96
Brown
6.07
Hazelgreen
Hazelgreen
Red NE
2.85
OFFICE
Red N
1.76
Green E
61.82
White
55.74
Green W
19.84
Dairy Pond
Red E
60.73
Red W
96.59
Brush Creek
NORTH
1 inch = 1000 feet


MALLORIES DAIRY
HEADQUARTERS
Silage
Pond
Silage
Silage
Blue
Black NW
Black
Brown
Calf Hutch
SHOP
Hay Barns
Calf Hutch
Red N
OFFICE
Commodity
Creamery
Barn
Barn
Barn
Barn
PARLOR
Barn
Heifers
LAGOON
NORTH
Red E
GIS Mapping by Northwest Ag Consulting

MALLORIES DAIRY SOILS AND WATER FEATURES



MALLORIES DAIRY SOILS BY ACREAGE



SOIL	ACRES	PERCENT
AMITY	43.13	10.1
CAMAS	1.86	0.4
CLOQUATO	206.59	48.6
DAYTON	10.56	2.5
MCBEE	116.03	27.3
NEWBERG	2.62	0.6
TERRACE ESCARPI	2.8	0.7
WOODBURN	41.52	9.8
TOTAL	425.11	100

NORTH

SCALE: 1 inch = 950 feet

GIS Mapping by Northwest Ag Consulting

SOILS

The topography of the farm rests on two surfaces – an upper terrace, terrace escarpments, and a lower terrace. The upper terrace consists of Amity, Dayton, and Woodburn soils. The lower terrace consists mainly of Cloquato and McBee soils with small areas of Newberg and Camas soils near the creek. Cloquato and Newberg soils are Hydrologic Group B, Amity, McBee, and Woodburn are Group C, and Cove, Dayton, and Wapato are group D.

The upper terrace tends to be more well drained than the lower terrace and may be considered for wet season manure applications if the soil hydrology and weather are favorable. The lower terrace soils should not have any manure applied during the wet season and thus the case for at least 150 days of storage is justified.

In fact the Amity soils may have a high water table from November through May. While these fields do not flood, occasionally water is standing on the surface during the rainfall period.

Like the crop yield data collection, all fields will be sampled in the fall after corn harvest but prior to the first significant rainfall. The dairy operator has some record of existing soil analysis.

Using OSU Extension publication EC 1478 "Soil Test Interpretive Guide" (August 1996) as a guide, one may infer that residual fall soil test values which were at or below the high status for NPK would be found acceptable. Those values as shown in Tables 1-3 of that publication are 30, 100, and 800 ppm for N, P, and K; respectively.

As a starting point, if any of these levels are exceeded, then the operator will need to address means for lowering them, which usually includes reduced manure application on those fields while soil nutrients are mined out as crop nutrients.

FIELD SUMMARY & P INDEX

Grower:	Mallories Dairy
Application Plan by:	Northwest Ag Consulting
Date:	January 5, 2005

Field	Blue	Red W	Red E	Green W	Green E	White	Red NE	Black	Brown
Acres	36.96	96.59	60.73	19.84	61.82	55.74	2.85	70.71	6.07
Predominant Soil	Cm, CLOQUATO	Cm, CLOQUATO	Cm, CLOQUATO	Mb, MCBEE	Cm, CLOQUATO	Cm, CLOQUATO	Am, AMITY	WuA, WOODBURN	WuA, WOODBURN
Soil test date	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2004	April 1, 2003
Bray 1 P (ppm)	99	130	125	101	104	98	143	74	80
Acetate K (ppm)	571	450	504	449	428	517	571	142	161
pH	6	6.4	6.1	6.4	6.6	6.3	5.5	6.1	6.0
SMP	6.1	6.6	6.4	6.5	7	6.5	6.1	6.5	6.3
		0							
TRANSPORT FACTORS									
Sheet & rill erosion (tons/ac-yr)	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
Irrigation 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	no irrig. runoff
Runoff Class	low	low	low	medium	low	low	medium	medium	medium
Flooding Frequency	occasional	occasional	occasional	occasional	occasional	occasional	none	none	none
Distance to stream (ft)	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft	<100 ft	>500 ft	>500 ft	>500 ft
Buffers	20-30 ft	20-30 ft	20-30 ft	20-30 ft	20-30 ft	20-30 ft	20-30 ft	none	none
Drainage	no tiles	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	0
Commercial P2O5 method	None applied	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	None applied
Organic P2O5 rate (lbs/ac)	186	186	186	186	186	186	186	186	186
Organic P2O5 method	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days	Not incorp. in 5 days
Organic P2O5 timing	No app. Sept. thru Jan.	No app. Sept. thru Jan.	No app. Sept. thru Jan.	No app. Nov. thru Jan.	No app. Nov. thru Jan.	No app. Nov. thru Jan.	No app. Nov. thru Jan.	No app. Nov. thru Jan.	No app. Nov. thru Jan.
SCORE	18.6	21.7	21.2	21.8	21.1	20.5	23.8	16.9	20.5
P RUNOFF RISK RATING	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
MANAGEMENT CLASS	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen	Nitrogen

COMMENTS

The lower terrace fields are all adjacent to Pudding River and Silver Creek which flow year around. Nutrient applications to these fields, whatever the source, should be based upon sound agronomic estimates of plant uptake and crop yield in order to achieve low residual nutrients in the soil prior to the onset of fall precipitation.

Total of Weighted Rating Values	Site Vulnerability	Nutrient to Manage
<13.0	Low	N
13.0-25.0	Medium	N
25.1-50.0	High	P
>50.0	Very High	No application

OPERATION AND MAINTANENCE

Above and/or Below Ground Liquid Tank

The underground tank serves as a collection point for effluent to drain to, or be scraped from the animal housing areas. Manure is diluted here with wastewater from the milking parlors and the processing plant, then pumped over the separator, The manure solids are hauled daily and the water goes into the lagoon. The tank is emptied several times each day. At least twice a year rocks and debris are removed from the tank and it is examined for structural damage and leakage. Any damage found shall be corrected before putting the tank back in service.

The new barn is equipped with a flush system utilizing waste water from the processing plant or the lagoon. Flush water and manure go into a rock trap and is pumped to two separators with the solids hauled daily and the water goes into two settling basin, then pumped to the lagoon.

In late winter, when the old lagoon gets full, water is pumped through underground lines to the new lagoon. The water going to the new lagoon is fairly high quality and has enabled the new lagoon to remain sludge free.

Continually maintain all pumps, agitators, piping valves and all other electrical and mechanical equipment in good operating condition by following manufacturer's recommendations. Float valves will be maintained in good working order. Perform daily inspections of waterlines including drinking water or cooling water lines. Repair leaking lines immediately to prevent excess water from entering the waste storage system. Depth markers are installed to assure maximum volume will be maintained and checked weekly. Before entering a tank, for any reason whatever, proper ventilation shall be provided, and self-contained breathing apparatus shall be used, if required, when entering a covered tank. No one shall enter the tank unless safety ropes are used and someone else capable of providing assistance is outside of the tank. Warning: Entering Unventilated Tanks Is Extremely Dangerous.

Animal Access Lanes or Walkways

Damaged components will be repaired or replaced as needed. Debris and excess manure will be removed from roadway surfaces, road ditch and drainage areas. Maintain drainage area capacities. Maintain good vegetative cover on all slopes and watercourses.

Agitator

Preventative maintenance will be in accordance with the manufacturer's recommendations. Periodically examine the agitator for proper operation. Clean debris from the propeller and promptly replace any defective or damaged parts. Remove the agitator from the manure tank or pond and periodically clean and oil as needed to increase the life expectancy of the agitator. Immediately repair any vandalism or livestock damage. Do not allow livestock near the equipment during operation.

Concrete Gutters
Floor gutters and grates will be inspected periodically. All foreign material restricting flow will be removed. Damage will be repaired as needed.

Curbs
Curbs, gutters and slabs that are used to convey effluent will be inspected periodically. Broken sections will be repaired or replaced. Manure or other solids will be prevented from building up next to curbs or flowing over them. If over flow is a consistent problem the curb height should be increased.

Culverts
Inspect annually or after large rainfall event. All foreign objects restricting water flow will be removed. Damaged sections will be repaired or replaced. Erosion around inlet or outlet will be corrected.

Dry Stack Storage Facility
Solid manure storage facility will be inspected annually. Broken slabs and curbs will be repaired. Repair or replace rusted or damaged areas on roof structure. Broken gutters and/or downspouts will be repaired or replaced. Check for adequacy and function of drain away from downspouts. Check side and back walls for soundness. Manure solids and leachate will not escape through cracks in the facility.

Fencing
Fences will be inspected periodically. Broken or decayed posts will be replaced. Sagging wire will be tightened. Broken wire will be spliced or replaced. Broken or missing insulators for electric fencing will be replaced. Vegetation will be controlled under the fences. Electric fencing will be sufficiently charged to detour animals.

Filter Strips
Maintain vigorous growth of vegetative covering. This includes reseeding, fertilization and application of herbicides when necessary. Periodic mowing, harvesting or grazing may also be needed to control height. Remove all foreign debris that hinders system operation. Limit the traffic from filter strip area. Limit livestock usage to vegetative growth periods when the animals will not damage vegetative root system or compact the soil. Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage.

Gutters and Downspouts
Gutters will be inspected annually to ensure all gutters are free of foreign materials. Broken gutters or downspouts will be replaced or repaired. Gutters will be connected to downspouts. Leaky gutters and downspouts will be repaired. Weeds and sediment will be removed from downspout outlets. All downspouts will be connected to outlets, which are kept free flowing. Outlets will be inspected for rodent guards and repaired or replaced as needed.

Irrigation Water Management
Irrigation water application will be at rates that minimize transport of sediment, nutrients, and chemicals to surface water and ground water. Equipment modifications and/or soil amendments should be considered to reduce erosion if needed.

Manure Application Equipment
All manure application equipment (including but not limited to sprinklers, big gun irrigators, spreaders and/or tank wagons) will be operated and maintained according to the manufacturer's manual. Equipment found to be broken or worn will be replaced. Equipment will be calibrated to ensure recommended rates are applied. Liquids will be drained from sprinklers or big guns prior to freezing weather. When system is flushed, rinse water is used following waste, and liquid and sediment is applied agronomically. Nozzles will be checked periodically and if worn, nozzles will be replaced. Minimize exposure to animal and organic waters and manure gasses. Wear protective clothing when appropriate. When cleaning equipment after nutrient application, remove and save wastes in an appropriate manner. Avoid applying manure near surface water by establishing buffer strips and set backs, and use extreme care to avoid contaminating ground water.

Manure Effluent and Irrigation Transfer Lines.
Manure, effluent and irrigation lines shall be flushed with clean water periodically to prevent particle buildup and plugging. Manure flushed from the lines will be applied agronomically so that surface and groundwater will be protected. Manure, effluent and irrigation lines shall be inspected periodically for leaks or worn out nozzles, and repairs or replacements made as needed. Special inspection shall be done to pressure relief valves, risers and control valves. Shut off valves will be inspected annually. Avoid unnecessary travel over pipelines that will damage their integrity. Equipment found to be broken or worn will be replaced. Water will be drained during cold weather to prevent frozen or broken lines. These lines can explode if not properly maintained and may cause human injury.

Pumps
Pumps will be maintained in accordance with manufacturer's operation and maintenance manual. Pumps will be inspected periodically to identify and remove debris wrapped around impeller or worn parts. Appropriate action will be taken to repair any worn parts. Liquids will be drained from pump prior to freezing weather to prevent breakage. It is recommended to have a spare pump or back up system in case a pump must be removed for an extended time for repair.

Roofs
Roofs will be inspected annually. Rusted sections will be replaced or repaired if needed. Loose sections will be secured. All broken trusses, beams, poles, gutters and downspouts will be repaired or replaced.

Solid Manure Separator
The separator should be inspected regularly for deterioration of protective coatings and repaired as necessary. All plumbing will be inspected annually and broken lines will be replaced or repaired. Loose connections will be tightened. If applicable, electric motors, pumps and gears

should be routinely maintained. Separator will be operated and maintained according to manufacturer's manual.

Trough or Tank

Watering facility will be inspected periodically. Damaged tank/trough will be repaired or replaced. Float valves will be maintained in good working order. Area immediately surrounding the trough/tank will be maintained in a stable condition. Watering facility will be inspected periodically. Damaged tank/trough will be repaired or replaced. Float valves will be maintained in good working order. Area immediately surrounding the trough/tank will be maintained in a stable condition. Watering facilities will not be allowed to overflow if additional liquid will affect waste storage capacities.

Waste Storage Pond

Prior to the storage season, empty the pond to provide storage capacity for the accumulation of wastewater and precipitation during the winter storage period. Sludge and accumulated solids will be removed from the pond periodically when buildup limits storage capacity in the pond. Depth markers are installed to assure maximum volume will be maintained and checked weekly. A 2-foot free board will be maintained to prevent spillage.

Maintain all pumps, agitators, pipeline, valves, and electrical and mechanical equipment in good operating condition following the manufacturer's recommendations. Immediately repair any vandalism, vehicular, or livestock damage to any earth fill. Immediately remove any obstructions or blockage of spillways, trash racks or pipe inlets. Settlement or cracks in earthen sections should be investigated to determine cause and immediately repaired. Maintain vigorous growth of vegetative coverings on the dikes to eliminate soil erosion. Eradicate or otherwise remove all rodents or burrowing animals and repair any damage caused by their activity. Fences and/or warning signs should be maintained as necessary to unauthorized human or livestock entry. Operate systems in a manner that minimizes odor and drift.

MALLORIES DAIRY – MANURE TESTING AND MONITORING PROTOCOLS

MANURE TESTING

The main purpose of manure testing is to obtain reasonably accurate values for the nutrients that are contained in the manure which will allow application rates to be determined for various crops. Oregon State University (OSU) has fertilizer guides available for the commonly grown crops in the state. At Mallories Dairy, manure tests are obtained from the irrigation system during application to determine the amount of nutrients applied to the crops. Tests are taken of the finished compost.

Liquid manure samples are obtained from a bleed valve located near the pumping station near the lagoon. The valves are opened and allowed to run free for 1 minute then three samples are obtained and homogenized in a bucket. A subsample is placed in screw lid container and frozen prior to shipping unless shipment is to occur that day. At a minimum the samples will be tested for Total nitrogen (TKN), phosphorus (P), potassium (K) and moisture content (%). The test results will be kept at the office.

Solid manure and/or Compost samples will be obtained from a minimum of 10 locations around the solids pile and placed in a suitable, non-leaking and airtight enclosure such as a Ziploc type plastic bag. The samples will be placed in a freezer until shipment or shipped immediately to a laboratory for testing. At a minimum, the samples will be tested for Total nitrogen (TKN), phosphorus (P), potassium (K) and moisture content (%). The test results will be kept at the office.

Annually, after the test results have been obtained, the application sheets will be reviewed to ensure that the gross nutrient application are within suggested guidelines.

Mallories Dairy may haul manure solids or compost for customers but does not spread it. . Manure export is interpreted as delivering manure to a location and in amounts specified by the customer. The level of responsibility for application at proper agronomic rates rest with the customer.

Mallories Dairy will keep customer names and addresses for all manure and/or compost sold off-farm. Additionally, the customer will be given a data sheet showing the nutrient content of the manure and appropriate agronomic rates for the crop.

Manure Nutrient Applications:
Manure application rates are derived from the records maintained at the dairy. Dates and rates are determined for each field from the records and used to determine the application rate for each field. Applications rates are determined by the dairy through the use of rain gauges placed in the field during applications. Each traveling gun sprinkler covers an area of approximately its wetted diameter (in feet) times the length of the hose pull divided by 43,560 which equal acres, although actual area is dependent upon the field shape, pump pressure, gun speed, and wind conditions at the time of application. Application volumes are determined by multiplying the number of inches of manure applied by 27,158 gal/acre-inch to get the number of gallons applied per acre.

Estimates of annual manure volumes applied to each field are calculated by multiplying the number of acres in the field and the number of application to that field by the application volume. The actual estimate of nutrients applied on a per acre basis is to be derived from the manure test values for each nutrient times the annual manure volume applied. After calculating for net application losses and denitrification losses, the percent of applied nutrients remaining are estimated at 60, 100, and 100%, for N, P, and K respectively; based upon the poorly drained soil types present on the dairy. These figures are consistent with similar estimates in ORAWM and USDA NRCS guidelines.

SOIL TESTING

The main purpose of soil testing is to determine the current nutrient status of the soil at the depth of the test. As the soil is a dynamic system highly influenced by climatic conditions, cropping, and farming operations, it is important that adequate sites be sampled in the field to represent the true condition of the soil at the time of the test and , for comparison purposes, that the sampling occur at the same time each year. The OSU Bulletins below provide guidance for soil sampling and interpretation.

OSU BULLETINS

EC 628 - Soil Sampling for Home Gardens and Small Acreages outlines approved methods for obtaining soil samples which are representative of the area being tested and proper handling and shipping procedures.

EC 1478 Soil Test Interpretation Guide outlines interpretations and needs for various crops commonly grown in the state.

EM 8677 - A List of Analytical Laboratories Serving Oregon

EM8768 – Calculating Dairy Manure Nutrient Application Rates details protocols for calibrating manure application equipment.

Soils will be tested annually in the fall of each year after harvest. Soils will be sampled on a field basis with a minimum of 20 cores taken per field to a depth of 12 inches. The sample will be homogenized and placed into a suitable container for shipping. If shipping is not to occur the day of sampling, the sample will be frozen until shipment.

At a minimum, the sample will be tested for nitrate-nitrogen (NO_3-N), ammonium-nitrogen (NH_4-N), phosphorus (P), and potassium (K). The test results will be kept at the office.

CROP NUTRIENT REMOVAL

Yield Data:
Crop yield data is to be obtained from the dairy for all crops grown. Crop yield information is to be based on scale weights from trucks as they come in from the field. If truck loading is consistent, a few random loads may be selected for weighing rather than weighing all loads. Data will be kept as to the number of loads and test weight for each field. Dry matter yields are calculated by multiplying the mean per acre yield value by the acreage and moisture percentage.

Crop Nutrient Uptake:
Crop nutrient removal rates are derived by multiplying the calculated DM yields by the appropriate nutrient concentration estimate for that crop. Nutrient removal by crops are derived from laboratory test results of the harvested crops. This method allows the nutrient mass balance to be calculated more precisely for the dairy rather than using values derived from national averages.

Nutrient Balance Estimates:
The overall nutrient balance is estimated by dividing the amount of nutrients applied by the amount of nutrients taken up by the crop. An estimate of performance is calculated as the in(de)crease in over application compared to last years status review on a pound per pound basis.

MALLORIES DAIRY – ANIMAL MORTIALITY PLAN

All animal mortalities which occur at the dairy are removed from the Dairy by Whites Hauling and Farming. Whites is licensed by the State of Oregon and other permitting agencies to handle this type of cargo.

ANIMAL WASTE MANAGEMENT PLAN
RECORD KEEPING AND REPORTING TO OREGON DEPARMENT OF AGRICULTURE

RECORD KEEPING:

a) Applications of manure, litter and process waste will be kept, including the date and the amount of N and P applied during each application.
b) Records of exporting manure, litter and process waste will also be kept.

REPORTING TO OREGON DEPARTMENT OF AGRICULTURE (ODA):

a) Any discharge will be reported orally to ODA within 24 hours. Within 5 days, a written statement describing this discharge will also be submitted to ODA.
b) The amount of manure, litter and process waste applied will be reported annually.
c) The amount of manure, litter and process waste exported will be reported annually.

ADDITIONAL REQUIREMENTS FOR LARGE FEDERAL CAFOs

	FREQUENCY OF INSPECTIONS	ITEM(S) TO BE INSPECTED
A) INSPECTIONS:	DAILY	• Water lines
	WEEKLY	• Storm water diversions • Run-off diversions • Waste transport • Storage structures • Storage structure volume
	PERIODIC	• Application equipment leaks

B) RECORD KEEPING:

Record results of:

1) Daily inspections.
2) Weekly inspections.
3) Periodic inspections.
4) Corrective actions taken, explain those not corrected.
5) Expected crop yields (if not in the plan).
6) Weather conditions at the time of manure, litter or process water application and 24 hours before and after application.
7) Total amount of manure or wastewater transferred to other persons, including date and amount of each transfer and the name and address of each recipient.

C) OPERATION REQUIREMENTS:

1) Must have depth markers in all surface liquid impoundments (i.e. lagoons, ponds, tanks). Markers must indicate:
   a. Maximum design volume.
   b. Minimum capacity necessary to contain 25-year, 24 hours rainfall event.
   c. Depth of manure and process wastewater.
2) Maintain setback area within 100 feet of any down gradient surface water, open tile line intake structure, sinkholes, agricultural wellheads, or other conduits to surface waters where manure, litter, and other process wastewaters are prohibited. As a compliance alternative, and if demonstrated to the satisfaction of ODA, the permittee may:
   a. Establish a 35 ft vegetated buffer where manure, litter and other process waste waters are prohibited: or
   b. Demonstrate that a setback or vegetated butter is not necessary or may be reduced.

D) MONITORING:

1) Collect and analyze manure, litter and other process wastewaters annually for nutrient content, including nitrogen and phosphorus.
2) At least once, during the term of the permit, collect and analyze representative soil samples for phosphorus and nitrogen content from all fields where manure, litter and other process waste waters are applied

ANIMAL WASTE MANAGEMENT PLAN
MINIMUM REQUIRED ELEMENT

AMENDMENT TO THE ANIMAL WASTE MANAGEMENT PLAN

_____ _____

CONFINED ANIMAL FEEDING OPERATION CAFO OPERATOR'S NAME

_____ _____

STREET ADDRESS, CITY, STATE, ZIP PHONE NUMBER

On_____, _____

INSPECTOR'S NAME

of the Oregon Department of Agriculture discussed modifications to Animal Waste Management Plan (AWMP) #_____.

The following modification were made to this AWMP:

1)_____

_____

_____

2)_____

_____

_____

3)_____

_____

_____

CONCLUSION:

____ The above amendments are accepted.

_____ _____

INSPECTOR'S SIGNATURE OPERATOR'S SIGNATURE

Amity Series

The Amity series consists of somewhat poorly drained soils that have formed in mixed alluvial silts. These soils have slopes of 0 to 2 percent. They occur on broad valley terraces at elevations of 150 to 350 feet. The average annual precipitation is between 40 and 45 inches. The average annual air temperature is 52° to 54° F., and the length of the frost-free season is 190 to 210 days. In areas that are not cultivated, the vegetation is mainly grasses, shrubs, hardwoods, :and scattered, Douglas-firs. Amity soils are associated with Dayton and Concord soils.

In a typical profile, the surface layer is very dark grayish-brown silt loam that is mottled in the lower part and is about 17 inches thick. The subsurface layer is mottled dark-gray silt loam about 7 inches thick. The subsoil is mottled grayish-brown silty clay loam about 13 inches thick. A substratum of mottled olive-brown silt loam underlies the subsoil.

The Amity soils are used mainly for cereal grains, grass grown for seed, and pasture. When irrigated, areas that are drained can be used for all the crops commonly grown in the survey area.

Amity silt loam (Am).-This is the only soil of the Amity series mapped in the survey area. It occupies slightly convex or nearly level areas on terraces consisting of Willamette silts. Representative profile 30 feet east of a paved road (SW1/2SE1/4 sec. 10, T. 5 S., R. 2 W.)

Included with this soil is mapping were small areas of soils that are in drainageways and depressions and that have slopes of 2 to 5 percent. Also included were small areas of Woodburn and Concord soils.

The available water capacity ranges from 9 to 12 inches. Permeability is moderately slow, and fertility is moderate. Runoff is slow, and erosion is not a hazard or is only a slight hazard. The depth to which roots can penetrate is moderately restricted by wetness, partly caused by a high water table that is near the surface during winter and spring. Workability is good, but this soil compacts easily if it is cultivated when wet.

Undrained areas of this soil are used for small grains, pasture, and grasses grown for seed, but drainage is needed for berries, vegetables, and specialty crops. If this soil is drained and irrigated, it can be used for all the crops commonly grown in the survey area. Evan after drainage is installed, however, there are slightly restrictions to use of this soil for deep-rooted crops that cannot tolerate excessive moisture. Nevertheless, response to drainage and fertilizer is generally good. (Capability unit IIw-2; not placed in a woodland suitability group)

Camas Series

The Camas series consists of excessively drained soils that formed in recent alluvium derived mainly from basic igneous and sedimentary rocks. These soils have slopes of 0 to 3 percent. They occur on bottom lands of the large streams. Elevations range from 125 to 500 feet. The average annual precipitation is

between 40 and 45 inches, the average annual air temperature is 52° to 54° F., and the length of the frost-free season is 200 to 210 days. In areas that are not cultivated, the vegetation is mainly ash, oak, alder, rose, blackberry, annual weeds, and grasses.
Camas soils are associated with Newberg and Cloquato soils.
In a typical profile, the surface layer is dark-brown gravelly sandy loam about 9 inches thick. The substratum, just beneath the surface layer, is dark yellowish-brown very gravelly sand that extends to a depth of 60 inches or more.
The Camas soils are used mainly for small grains, for pasture, or as woodland. When irrigated, they are used for all the crops commonly grown in the survey area.
Camas gravelly sandy loam (Ca).-This soil occupies small areas along Butte Creek and the Willamette, North Santiam, and Santiam Rivers. It is the only soil of the Camas series mapped in the survey area.
Representative profile (SW1/4SE1/4 sec. 11, T. 9 S., R. 1W.)
Included with this soil in mapping were small cobbly areas and other small areas that have a surface layer of silt loam.
The very gravelly or cobbly substratum near the surface restricts the available water capacity, which is 3 inches or less. It also restricts the depth to which roots can penetrate.
Permeability is very rapid, and fertility is low. Runoff is very slow, and erosion is generally only a slight hazard. Areas adjacent to streams are moderately susceptible to erosion because they are usually flooded at least once each year. Workability is poor.
This soil is used mainly for small grains, for pasture, or as woodland. When irrigated, it is used for all the crops commonly grown in the survey area, although it is poorly suited to root crops and to many other crops. (Capability unit IVw-3; not placed in a woodland suitability group

Cloquato Series

The Cloquato series consists of well-drained soils that have formed in alluvium. These soils are nearly level and gently undulating, and they are on flood plains of the major streams. The areas are traversed by overflow channels and sloughs. Elevations range from 100 to 650 feet. The average annual precipitation is 40 to 45 inches, the average annual air temperature is
fir, cottonwood, bigleaf maple, Oregon white oak, ash, and an understory of vine maple, wild blackberry, vines, shrubs, and grasses. Cloquato soils are associated with Chehalis and Newberg soils.
In a typical profile, the surface layer is dark-brown silt loam about 9 inches thick. The subsoil, which is also dark brown silt loam, is about 56 inches thick. The substratum is dark-brown fine sandy loam that extends to a depth of 83 inches or more.
Cloquato soils that are not irrigated are used mainly for small grains, orchards, pasture, hay, and grass grown for seed. When irrigated, these soils are used for all the crops commonly grown in the survey area.
Cloquato silt loam (Cm).-This is the only Cloquato soil

mapped in the survey area. It occupies large areas along the Willamette, Pudding, and Santiam Rivers and along Butte Creek.1 Representative profile (E1/2SE1/4 sec. 20, T. 6 S., R. Included with this soil in mapping were small areas of Chehalis, Newberg, and Camas soils, and small areas in which the substratum is gravelly. Also included were areas of steeper soils that have short slopes and that are adjacent to sloughs and old stream channels. The included areas make up from 10 to 15 percent of the acreage in this mapping unit.
The available water capacity is 12 to 14 inches. Permeability is moderate, and fertility is high. Runoff is slow, but the hazard of erosion is slight to moderate as the result of periodic overflow. Overflow generally occurs about once in 3 or 4 years, but it occurs two or more times in some years. Roots can penetrate to a depth of 5 feet or more. Workability is very good. This soil is used mainly for small grains, orchards, pasture, hay, and grass grown for seed. When irrigated, it is used for all the crops commonly grown in the survey area.
This soil is well suited to all the commonly grown crops. Floodwaters leave debris, and they can erode deep holes in orchards and in areas occupied by other permanent crops. (Capability unit IIw-3; not placed in a woodland suitability group).

Dayton Series

The Dayton series consists of soils that are poorly drained. These soils have formed mainly in old mixed alluvium, but their upper layers may have been influenced, to some extent, by loess. The soils are on broad valley terraces, and they occur in drainageways and in shallow depressions. Slopes range from 0 to 2 percent, and elevations range from 125 to 350 feet. The average annual precipitation is 40 to 45 inches, the average annual air temperature is 52° to 54° F., and the length of the frost-free season is 190 to 210 days. In areas that are not cultivated, the vegetation is mainly annual and perennial grasses, wild rose, and scattered ash trees. Dayton soils are associated with Amity and Concord soils.
In a typical profile, the surface layer is very dark grayish-brown silt loam about 7 inches thick. The subsurface layer is mottled dark-gray silt loam about 6 inches thick. The subsoil is mottled and consists of a layer of clay about 33 inches thick. It is dark gray in the upper part and is grayish brown in the lower part. The substratum is mottled grayish-brown silty clay loam that extends to a depth of 60 inches or more.
The Dayton soils are used mainly for small grains, pasture, hay, and grass grown for seed.
Dayton silt loam (Da).-This soil is on terraces, where it occupies small areas in drainageways and depressions. It is the only soil of the Dayton series mapped in the survey area. Representative profile (SW1/4NE1/4 sec. 16, T. 6 S., R. 2 W.).
Included with this soil in mapping were small areas of a Concord soil. The included areas make up as much as 5 percent

of the acreage in the mapping unit.
The available water capacity above the clay subsoil is 3 to 6 inches. Permeability is very slow, and fertility is low. Runoff is very slow to ponded, and the hazard of erosion is slight. Roots can penetrate to the claypan, which is at a depth of only 12 to 24 inches. Workability is good, but this soil tends to puddle and compact if it is cultivated when too moist.
Undrained areas of this soil are used for small grains, pasture, hay, and grass grown for seed, and the drained areas are used for corn and for winter and spring small grains. When irrigated, this soil is used for sweet corn and bush beans. Even where it is drained, it is not suited to deep-rooted crops, many perennial crops, and crops that cannot tolerate excessive moisture. (Capability unit IVw1; not placed in a woodland suitability group)

McBee Series

The McBee series consists of moderately well drained, undulating soils that formed in mixed alluvium. These soils have slopes of 0 to 3 percent. They occur on flood plains that are traversed by sloughs and old overflow channels. Elevations range from 100 to 650 feet. The average annual precipitation is 40 to 45 inches, the average annual air temperature is 52° to 54° F., and the length of the frost-free season is 200 to 210 days. In areas that are not cultivated, the vegetation is mainly Douglas-fir, alder, ash, big-leaf maple, oak, and an understory of vine maple, blackberry, shrubs, and grasses. McBee soils are associated with Wapato and Chehalis soils.
In a typical profile, the surface layer is very dark brown silty clay loam about 10 inches thick. The subsoil is about 32 inches thick and is mottled throughout. It is very dark brown silty clay loam in the upper part; dark brown, very dark brown, and very dark grayish-brown silty clay loam in the middle part; and dark grayish-brown clay loam in the lower part. The substratum is mottled, dark gray clay loam that extends to a depth of 65 inches or more.
McBee soils that are not irrigated are used mainly for small grains, orchards, pasture, hay, and grass grown for seed. They are used mostly for row crops when irrigated.
McBee silty clay loam (Mb).-This is the only soil of the McBee series mapped in the survey area. It occurs along Butte Creek and along the Willamette, Pudding, and Santiam Rivers, and it is subject to frequent overflow.
Representative profile (SE1/4SE1/4 sec. 6, T. 6 S., R. 1 E.) .
Included with this soil in mapping were small areas of a soil that has a layer of gravelly material below a depth of 3 feet. Also included were small areas of Wapato and Chehalis soils.
The available water capacity is 12 to 14 inches or more. In many places the drainage has been improved by lowering the water table and by improving outlets. Depth to which roots can penetrate is still restricted, however, by a seasonal high water table. Permeability and fertility are both moderate, and runoff is

slow. Because of the frequent overflow, erosion is a moderate hazard. Workability is good, but regular additions of organic matter are needed to keep the soil structure from deteriorating and to keep tillage from becoming more difficult.
When not irrigated, this soil is used mainly for small grains, orchards, pasture, hay, and grass grown for seed. When irrigated, it is used for caneberries, sweet corn, beans, and hops. Drainage is not necessary for many crops, but it is needed if maximum use is to be made of this soil and if best returns are to be realized. Where this soil is drained, it is suited to all the crops commonly grown in the survey area. (Capability unit IIw-5; not placed in a woodland suitability group)

Newberg Series

The Newberg series consists of somewhat excessively drained soils that have formed in mixed alluvium over sandy or gravelly material. These soils are on flood plains that are traversed by old, meandering overflow channels and sloughs, and they are subject to frequent overflow. Slopes range from 0 to 3 percent, and elevations range from 100 to 650 feet. The average annual precipitation is between 40 and 45 inches, the average annual air temperature is 52° to 54° F., and the length of the frost-free season is 200 to 210 days. In areas that are not cultivated, the vegetation is mainly ash, oak, Douglas-fir willow, rose, blackberry, annual grasses, and weeds. Newberg soils are associated with Cloquato, Chehalis, and Camas soils.
In a typical profile, the surface layer is very dark grayish-brown fine sandy loam about 10 inches thick. The substratum, just beneath the surface layer, is dark yellowish-brown sandy loam that extends to a depth of 60 inches or more.
The Newberg soils are used mainly for small grains, orchards, pasture, row crops, and grass grown for seed.
Newberg fine sandy loam (Nu).-This soil is along the channels of Butte Creek and the Willamette, Pudding, and Santiam Rivers.
Representative profile (NE1/4SE1/4 sec. 24, T. 9 S., R. 2 W.).
Included with this soil in mapping were small areas that have a few pebbles in the surface layer and that have a gravelly subsoil. Also included were small areas of Camas, Cloquato, and Chehalis soils.
The available water capacity is 5 to 7 inches. Permeability is moderately rapid, and fertility is moderate. Roots can penetrate to a depth of 5 feet or more. Runoff is slow, and the hazard of erosion is moderate. Even where management is poor, workability of this soil is excellent, for the texture and structure of the soil material are difficult to change.
This soil is well suited to small grains, orchards, pasture, and grass grown for seed, and it is used mainly for those crops. When irrigated, it is used for all the crops commonly grown in the survey area. (Capability unit IIw-4; not placed in a woodland suitability group)

Newberg silt loam (Nw).-This soil has a profile similar to the one described for Newberg fine sandy loam, except that the surface layer is finer textured and is dark brown. Because of this finer texture of the surface layer, the range of moisture content within which this soil can be satisfactorily worked is narrower than for Newberg fine sandy loam. Also, the infiltration rate is reduced, and movement of water is slower through the surface layer to the coarser textured material below. The available water capacity is 6 to 7 inches.
This soil is used for about the same crops as Newberg fine sandy loam, except that it is not used for crops that are harvested late in fall. Irrigation is difficult because areas of this soil are small and are within larger areas of Cloquato and Chehalis soils. (Capability unit IIw-6; not placed in a woodland suitability group)

Terrace Escarpments
Terrace escarpments (Te) consists of gravelly and silty alluvium that is too variable in characteristics to be classified as soil. It is moderately steep or steep and occurs along the sidewalls of the major streams, on terrace scarps, and on the side slopes bordering channels of intermittent streams. The vegetation is mainly Douglas-fir, maple, hazel, swordfern, brackenfern, poison-oak, tussock, sedges, and grasses.
This land type is suitable for pasture and for use as woodland. The short, steep slopes make tillage impracticable. (Capability unit VIe-2; not placed in a woodland suitability group

Woodburn Series
The Woodburn series consists of moderately well drained soils that have formed in silty alluvium and loess of mixed mineralogy. These soils are on broad valley terraces. They have slopes of 0 to 20 percent. Elevations range from 150 to 350 feet. The average annual precipitation is 40 to 45 inches, the average annual air temperature is 52° to 54° F., and the length of the frost-free season is 200 to 210 days. In areas that are not cultivated, the vegetation is mainly grass and Douglas-fir. Woodburn soils are associated with Willamette soils.
In a typical profile, the surface layer is about 17 inches thick and is very dark brown silt loam in the upper part and dark-brown silt loam in the lower part. The subsoil is about 37 inches thick. It is dark yellowish-brown silty clay loam in the upper part; mottled dark-brown silty clay loam in the middle part; and mottled, dark-brown silt loam in the lower part. The substratum is dark-brown silt loam that extends to a depth of 68 inches or more.
The Woodburn soils are used mainly for small grains, pasture, hay, orchards, berries, and vegetables.
Woodburn silt loam, 0 to 3 percent slopes (WuA).-This soil is on broad terraces of Willamette silts.
Representative profile about 200 feet west of the paved road

to Champoeg (SW1/4SE1/4SE1/4 sec. 2, T. 4 S., R. 2 W.; profile No. 5 in table 9 in the section "Laboratory Data."). Included with this soil in mapping were small areas of Amity and Willamette soils, and small areas of a somewhat poorly drained soil. The areas of Amity soils occupy less than 5 percent of the acreage in this mapping unit. The areas of Willamette soils occupy as much as 10 percent.

The available water capacity is 11 to 13 inches. Permeability is moderate in the upper part of the subsoil, and it is slow in the lower part. Fertility is high. Depth to which roots can penetrate is restricted by a seasonal perched water table and as the result of the type of structure. Runoff is slow, and no apparent erosion has taken place.

This soil is used mainly for small grains, field corn, orchards, pasture, hay, caneberries, and vegetables. Areas that are drained are used for all the crops commonly grown in the survey area. Because of the perched water table, drainage is needed for crops that cannot tolerate excessive moisture. (Capability unit IIw-1; not placed in a woodland suitability group)

Woodburn silt loam, 3 to 12 percent slopes (WuC).-This soil has slopes of 3 to 5 percent in about 60 percent of the acreage. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

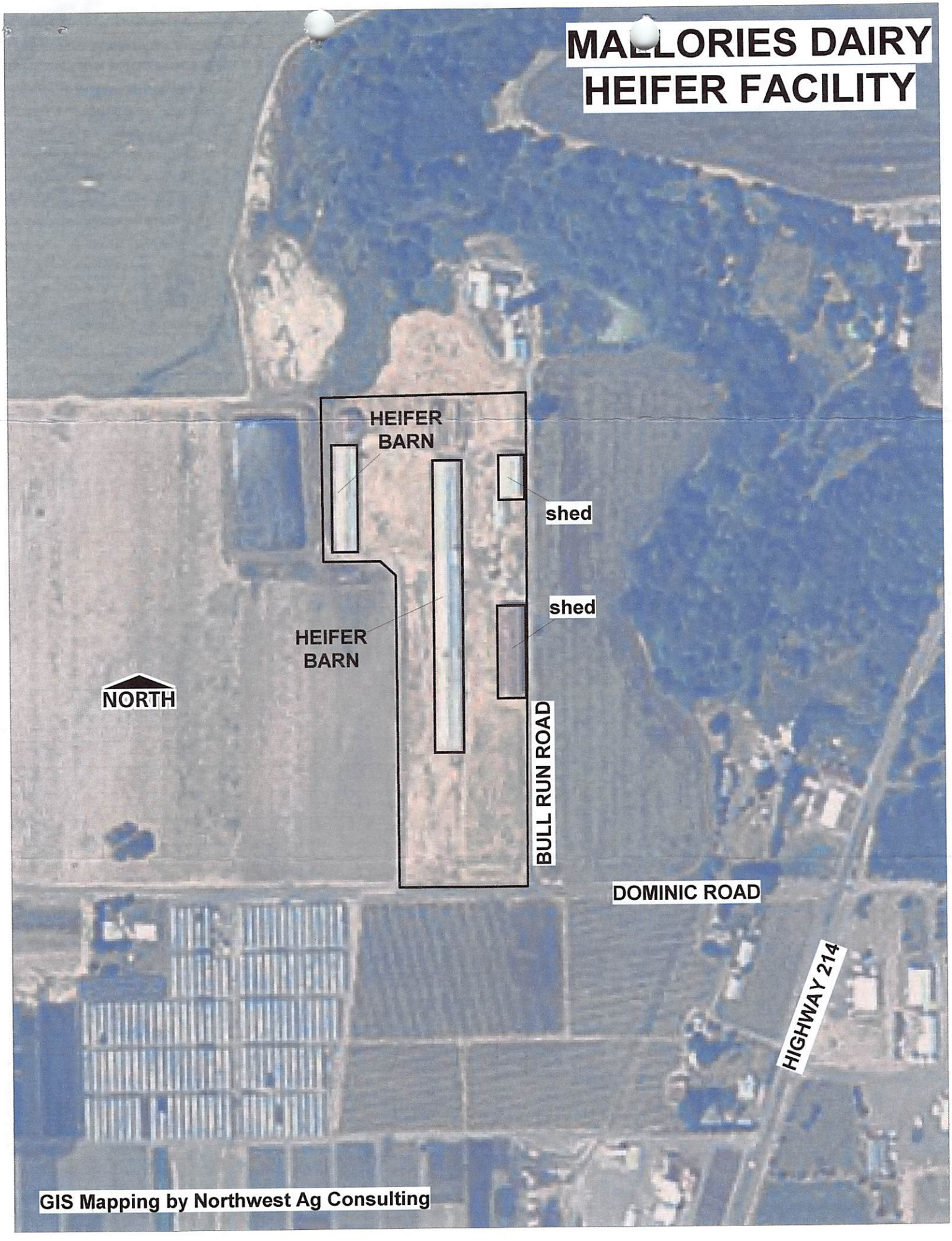
Included with this soil in mapping were small areas that have a thin surface layer and that have distinct mottling within 12 inches of the surface.

This Woodburn soil is used for about the same crops as Woodburn silt loam, 0 to 3 percent slopes. It is less suitable for vegetables and berries, however, because of the difficulty of cultivating those crops so that erosion is controlled without damaging the crop. Mechanical harvesting of vegetables and berries is difficult where slopes are steeper than 5 percent. (Capability unit IIe-1; not placed in a woodland suitability group)

Woodburn silt loam, 12 to 20 percent slopes (WuD).-Where this soil occurs along creeks, intermittent drainageways, and terrace fronts, its slopes are short and abrupt. Runoff is rapid, and the hazard of erosion is moderate.

Included with this soil in mapping were small areas that hve a thin surface layer and that have distinct mottling within 12 inches of the surface.

This Woodburn soil is used mainly for pasture, hay, and small grains, although some small areas are used for row crops and orchards. This soil is poorly suited to row crops; for the slopes are too short and steep for mechanical harvesting of vegetables, berries, and other row crops to be feasible. Tilling row crops so that excessive soil losses are avoided is also difficult. (Capability unit IIIe-1; not placed in a woodland suitability group)


MALLORIES DAIRY
HEIFER FACILITY
HEIFER BARN
shed
shed
HEIFER BARN
NORTH
BULL RUN ROAD
DOMINIC ROAD
HIGHWAY 214
GIS Mapping by Northwest Ag Consulting

REC'D APR 13 2017

ANIMAL WASTE MANAGEMENT PLAN AMENDMENT

BSP, Inc.
Confined Animal Feeding Operation

Dave Bielenberg
CAFO Operator's Name

11144 Hazel Green Road, Silverton, OR 97381
Facility Street Address, City, State, Zip

503-932-2861
Phone Number

Submitted to the Oregon Dept. Of Agriculture are the following modifications to Animal Waste Management Plan (AWMP) # 04208.

I would like to apply the following modifications to this AWMP:

① Remove Heifer North field
② Remove Heifer Facility
③ Remove Silage runoff collection pond

Operator's Signature

4/10/2017
Date

CONCLUSION:

X Approved _____ Denied

Inspector's Signature

Official Use:

MA#_____ Effective date:_____

Date copy sent to Operator:_____

Oregon
Kate Brown, Governor

Department of Agriculture
635 Capitol St NE
Salem, OR 97301-2532

Construction Approval Request

I would like to request approval for the following construction plans.

I plan on building a Wastewater Storage Pond (Structure) at my facility located at 11039 Hazelgreen Rd NE, Silverton, OR 97381 (Address / City / State / Zip). Bruce Wilson with H&R Engineering LLC (Organization / company) is responsible for the planning and/or construction of this structure.

Additional information and/or comments: The wastewater storage pond will capture runoff from the silage pit area and truck wash area that may contain silage leachate and other pollutants.

Attached are the completed documents required for construction approval.

Signature JJ Zuiter Date 5/23/19

Phone: (541) 740-1769 E-mail: jeremy@hctransloading.com

- ☑ Site map including the location of the proposed structure(s)
- ☑ Engineer-stamped drawing of the proposed manure storage structure(s)
- ☑ Operation and maintenance for the proposed manure storage structure(s)

FOR ODA USE ONLY:

MA#: _____
LOG#: _____
COUNTY: _____
STATUS: _____
DATE: _____
REVIEWED BY: _____ (initials)

DESIGN REPORT
for
High Caliber Transloading & Storage
Wastewater Storage Pond

SUMMARY: The project is located near Silverton, Oregon on the property of High Caliber Transloading & Storage. The project consists of constructing a wastewater storage pond to capture runoff containing silage leachate.

REFERENCES: 1. USDA Natural Resources Conservation Service (NRCS) Agricultural Waste Management Field Handbook
2. USDA Natural Resources Conservation Service (NRCS) Practice Standards 313-Waste Storage Facility and 521-Pond Sealing or Lining.

LOCATION: The project is located in the SE ¼ of Section 29 Township 6 South, Range 1 West from the Willamette Meridian.

PURPOSE: Provide storage for runoff containing silage leachate to prevent degradation of surface and groundwater sources and provide flexibility in application of stored runoff to cropland fields for utilization of nutrients and organics.

PROPOSED WORK: The wastewater storage pond is designed to collect and store runoff containing silage leachate until the stored runoff can be applied to cropland fields. The wastewater storage pond will be constructed by excavating an average of 6 feet of soil to construct the embankment that will have a 10 foot top width, 3:1 inside side slopes, 2:1 outside side slopes with a maximum embankment fill height of 6 feet. The storage capacity of the planned wastewater storage pond will have a storage capacity of 7.02 acre-feet. All outflow will be controlled by pumping and in addition an emergency vegetated earthen spillway located at station 0+00 will provide control of any unplanned outflow from the wastewater storage pond that might cause a breach of the wastewater storage pond embankment. The inside bottom and sides of the wastewater storage pond will be treated with an environmental soil sealant (ESS-13) to form a 1 foot thick compacted soil liner to reduce seepage to less than 1.0×10^{-7} cm/sec.

LAYOUT: The planned wastewater storage pond will be laid out at the time of construction by H&R Engineering with assistance from the landowner and contractor. A preconstruction conference will be held with the contractor, landowner and H&R Engineering at the time of layout to ensure everyone understands the requirements of the drawings and specifications.

DESIGN: A composite sample soil excavated from the storage area of the planned wastewater storage pond was submitted to NW Testing laboratory for soil mechanics analysis. The soil mechanics analysis requested included permeability in accordance with ASTM D5084-Method C and density tests in accordance with ASTM D698A.

Based on the soil mechanics report from the soil mechanics laboratory the soils were determined to be suitable for the intended use and the design of the planned wastewater storage pond was completed using criteria from NRCS practice standards 313-Waste Storage Facility and 521-Pond Sealing or Lining. The amount of runoff to be stored was determined using runoff calculations based on the area of the silage pits where silage is stored and the truck washout area. Runoff generated by average monthly rainfall and rainfall from a 25 year-24 hour storm rainfall along with

the estimated seepage from the stored silage was used to determine the amount of runoff to be stored.

A pumping plant will be installed at the wastewater storage pond and used to empty the pond by applying the wastewater to the adjacent cropland fields using a traveling big gun sprinkler irrigation system. The big gun sprinkler irrigation system is estimated to deliver approximately 250 gallons per minute to the cropland fields of the wastewater at agronomic rates.

The drawings and specifications for construction of the wastewater storage pond were prepared using criteria from NRCS practice standard 313-Waste Storage Facility.

CONSTRUCTION: The embankment for the planned wastewater storage pond will be constructed using soils from the storage area to an elevation of 156.0 feet. The embankment will be compacted with a sheepsfoot roller and/or rubber tire construction equipment using a maximum of 12 inch loose lifts during construction. The minimum compaction requirements are based on maintaining a minimum of 95% of the maximum dry density as per ASTM D698 keeping soil moisture content at levels adequate to meet the compaction requirements.

COST: The estimated cost of the project is $50,000.

ENVIRONMENTAL: Short term effects of the planned wastewater storage pond on the environment will be due to soils being exposed to possible wind and water erosion during construction. The construction specifications provide guidance for control of wind and water erosion during and after construction is completed. No wind and water erosion problems are anticipated once construction is completed and the exposed areas vegetated. Proper management of the facility after construction is completed will prevent any leakage, overtopping and minimize odors effecting the environment.

Design prepared by: Bruce D. Wilson
H&R Engineering LLC
Keizer, Oregon

CONSTRUCTION HIGH CALIBER TRANSLOADING & STORAGE

WASTEWATER STORAGE POND

The attached drawings and specifications set forth the requirements for the High Caliber Transloading & Storage wastewater storage pond project located in Marion County approximately 3 miles west of Silverton, Oregon off of Hazelgreen Road, more specifically described as being within the SE ¼ of Section 29 Township 6 South, Range 1 West of the Willamette Meridian. The project shall be constructed at the location and to the lines and grades as shown on the drawings in accordance with the construction and material specifications.

The owner is the official spokesperson for this project. The owner is the person who reviewed the construction plan, made all contractual agreements, ensures construction is in accordance with the requirements as set forth in the plans, obtains all permits and is financially responsible. The owner or their representatives are the only people who can authorize any changes during construction that incur financial obligations.

H&R Engineering is the engineer of record and has the authority to review the project during construction and make necessary tests to ensure that all work is done in compliance with the drawings and specifications.

The contractor has a contractual agreement with the owner for construction of the project in accordance with the drawings and specifications. The contractor shall not make changes to the drawings or specifications without prior approval of H&R Engineering and the owner. The contractor shall comply with all applicable permits and conduct the work in a safe manner.

DESIGN APPROVAL:

The drawings and specifications were prepared by Bruce D. Wilson, H&R Engineering LLC.

OWNER'S ACKNOWLEDGEMENT:

The owner acknowledges that:

a. They have received a copy of the construction drawings and specification, and that they understand the contents and requirements.

b. They understand that they are responsible for obtaining all permits relating to the construction and operation of this project.

c. They understand that H&R Engineering makes no representation as to the existence or non-existence of utilities. It is the responsibility of the owner and contractor to comply with the provisions of ORS 757.541 to 757.571. The owner and contractor will be liable for any damage resulting from disruption of service caused by construction activities. The phone number for the utility location service in Oregon is 811.

d. Proper operation and maintenance of the installed work is necessary for proper performance during the service life of the project.

Accepted by:

/s/ JJ Zuid Date: 5/22/19

Jeremy Zuidema

CHECKOUT:

I have made an onsite inspection of the project installation and have determined that project was installed according to the drawings and specifications. I have also documented the required items have be inspected in accordance with the basis of acceptance section in the construction specifications.

Installation certified by:

/s/ _____ Date _____

Job title: _____

CONSTRUCTION SPECIFICATIONS
FOR
HIGH CALIBER TRANSLOADING & STORAGE
WASTEWATER STORAGE POND

SCOPE

The work shall consist of the following:

1. Excavating and placing compacted soil to an elevation of 156.0 to create an embankment with a 10 foot top width and 3 horizontal to 1 vertical slopes on the inside and 2 horizontal to 1 vertical on the outside.
2. Treating a 1 foot thick compacted soil liner with an environmental soil sealant to provide seepage control.
3. Constructing a vegetated emergency spillway to control any unplanned outflow that may endanger the embankment of the wastewater storage pond.

All work shall be done to the neat lines, grades, elevations and dimensions shown on the drawings or as staked in the field.

DEFINITIONS AND RELATIONSHIPS OF PARTIES CONCERNED

The term "Owner" shall refer to the authorized representative of High Caliber Transloading & Storage who's representative signature appears on the Construction Requirements worksheet which is part of these specifications. The Owner is responsible for all expenditures for construction. All items of work to be paid by the Owner must have the Owner's approval.

It is understood that the Owner or their representative will execute the drawings and specifications to the best of their ability. Any changes made as construction progresses will be made with the advice and concurrence of H&R Engineering.

The term "Engineer" shall refer to the authorized representative of H&R Engineering.

The Engineer acting as a technical advisor for the Owner has compiled these drawings and specifications. The Engineer will provide surveys, tests, and technical direction of work so that the project may be constructed as planned. He or she cannot authorize changes without the Owner's approval.

The term "Contractor" shall refer to the authorized representative of Owner that is under a contractual agreement to complete the project according to the drawings and specifications.

The Contractor will provide the necessary equipment and manpower so that the project may be constructed as planned. He or she cannot make changes to the project without the Engineer's and Owner's approval.

The official drawings prepared by H&R Engineering and approved by the Oregon Department of Agriculture are part of these specifications.

The directions, provisions, and requirements contained herein pertain to the method and manner of performing the work and to the quality of materials to be used.

CONSTRUCTION OPERATIONS

Construction operations shall be performed in such a manner that soil erosion, air and water pollution are minimized. See the section on "CONTROL OF SOIL EROSION, WATER AND AIR POLLUTION" for more guidance.

All environmentally sensitive areas shown on the drawings or flagged at the construction site shall be avoided. If human remains are discovered, **stop construction** immediately, secure the site and contact the County Sheriff. If cultural materials are discovered, **stop construction** immediately and contact the County Environmental office for guidance. The Contractor shall be responsible for mitigating any damages to sensitive areas that are a result of construction activities not approved by H&R Engineering and the Owner.

All pollution control measures shall be adequately maintained in a functional condition as long as needed during construction operations. All temporary pollution control measures shall be removed and the site restored to the original conditions as practicable.

The Owner, Contractor or other persons will conduct all work and operations in accordance

with proper safety codes for the type of construction being performed with due regard to safety of all persons and property.

The completed project shall be workmanlike and present a good appearance.

CLEARING AND STRIPPING

All fill and excavation areas shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, rubbish and unstable soil.

The limits of the area to be cleared or stripped shall be marked by a suitable method.

All materials cleared from the designated areas shall be placed at locations and in a manner approved by the Owner or otherwise removed from the site.

EARTHFILL PLACEMENT

Foundation Preparation

After stripping, the foundation shall be loosened thoroughly by scarifying or discing to a minimum depth of 2 inches. The foundation area shall be bonded with the first layer of earth fill and compacted to the density and moisture specified for the earth fill. All foundation and abutment surfaces shall not be steeper than 1:1 unless otherwise specified on the drawings.

Material

The earth fill placed to construct the embankment shall consist of soil materials excavated from the borrow area that are approved by the Engineer. Fill materials shall not contain sod, brush, roots, or other perishable or compressible debris. No stones having maximum dimension of more than six inches shall be placed in the compacted earth fill. Any such stones, roots or other unsuitable material hauled into the embankment shall be removed prior to compaction, and be disposed of as directed by the Engineer.

Placement

The approved earth fill materials shall be placed on the embankment in a thin layer such that the combined thickness of this layer and the scarified surface of the foundation shall not exceed 12 inches before compaction. The thickness of spread layers shall be such that the required compaction can be obtained with the equipment used. The earth fill shall be constructed in continuous layers not be steeper than 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the previous layer to insure a good bond with the new fill. If the surface of any lift becomes too smooth for proper bond, it shall be adequately scarified before placement of the next lift.

The distribution of materials shall be such that the earth fill material will be free from lenses, pockets, streaks, or layers differing appreciably in texture from the surrounding material.

Moisture Control

The surface of the earth fill and the soil being placed shall be maintained at the proper moisture content during earth fill placement operations. The moisture content of the earth fill shall be adequate for obtaining the required compaction. As far as practicable the soil for the earth fill shall be between 22.0 and 31.5 percent moisture during compaction. The application of water to the soil for the earth fill shall be accomplished by irrigation of the borrow area.

During construction, the moisture content of the soil for the earth fill shall be determined from laboratory reports or from tests performed by the Engineer or their representative in the field. No soil shall be placed that does not have the moisture content as approved by the Engineer. Soil that is too wet shall be dried to meet this requirement, or removed, and soil that is too dry shall have water added and mixed until the requirement is met. Uniform distribution of the moisture shall be obtained by discing, blading or other approved method prior to compaction.

Compaction control

The earth fill shall be compacted by means of a sheepsfoot roller and/or rubber tire construction equipment of such size and weight that the materials will be compacted to a minimum dry density of 95% of the maximum dry density for the material as determined by laboratory analysis as construction progresses. Density of in-place earth fill shall be determined from laboratory reports or density tests performed in the field by the Engineer or their representative.

Heavy compaction equipment shall not be operated within 2 feet of any structure. Sheepsfoot rollers and/or rubber tire construction equipment shall not be operated within 5 feet of any structure. Hand directed tampers or compactors shall be used to compact earth fill adjacent to structures and pipe conduits. Earth fill compacted in this manner shall be placed in layers not greater than 6 inches in thickness before compaction and shall meet the same

density requirement as for the surrounding earth fill.

Earth fill not meeting the specified requirements shall be reworked or removed and replaced with acceptable fill.

Testing

Field Water Content-Density testing of the compacted earth fill will be conducted verifying the test results are within the moisture content and densities described herein. The Contractor is responsible for quality control of the compacted earth fill and shall coordinate with Engineer. Field tests to determine the water content and density of compacted earth fill shall be conducted during the course of the work using test procedures ASTM D-1556, “Density of Soil in Place by the Sand-Cone Method”, ASTM D-2167, “Density of Soil in Place by the Rubber Balloon Method”, ASTM D-2937, “Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method”, ASTM D-2923, and “Density of Soil and Soil Aggregate in Place by Nuclear Methods at Shallow Depths”. Records of test procedures and results shall be maintained and provided to the Engineer.

COMPACTED SOIL SOIL LINER

Foundation Preparation

After excavating for the compacted soil liner the foundation shall be loosened thoroughly by scarifying or discing to a minimum depth of 2 inches. The foundation area shall be bonded with the first layer of the compacted soil liner and compacted to the density and moisture specified for the liner. All foundation and abutment surfaces shall not be steeper than 3:1 unless otherwise specified on the drawings.

Material

The earth fill placed to construct the compacted soil liner shall consist of soil materials excavated from the sides and bottom of the storage area that are approved by the Engineer. Earth fill materials shall contain no stones, sod, brush, roots, or other perishable or compressible debris. Any such stones, roots or other unsuitable material excavated for the compacted soil liner shall be removed prior to compaction and be disposed of as directed by the Engineer. The environmental soil sealant (ESS-13) shall be applied during the construction of the compacted soil liner to provide seepage control.

Placement

The environmental soil sealant (ESS-13) shall be applied at the rate specified by the representative of Seepage Control Inc. for each layer of the compacted soil liner. The combined thickness of soil liner material and the scarified surface of the foundation shall not exceed 12 inches before compaction.

The distribution of materials shall be such that the earth fill will be free from lenses, pockets, streaks, or layers differing appreciably in texture from the surrounding material.

Moisture Control

The soil liner material shall be brought to the specified moisture range before compaction. The treated soil that is too wet for compaction shall be allowed to dry before compaction or be removed.

If the surface of the compacted soil liner becomes too dry, it shall be scarified by disking, or as approved by the Engineer, and moistened to the proper moisture content prior to compaction.

Compaction control

The treated soil shall be compacted by means of a sheepsfoot roller and/or rubber tired construction equipment of such size and weight that the materials will be compacted to a dry density as specified by the Engineer as construction progresses. Density of in-place compacted soil materials shall be determined from laboratory reports or density tests performed in the field by the Engineer or their representative.

The constructed density and water content of the compacted soil liner shall be such that the compaction will be 95% or greater than the maximum dry density of the soil liner material as determine from laboratory analysis.

Earth fill not meeting the specified requirements shall be reworked or removed and replaced with acceptable earth fill.

CONTROL OF SOIL EROSION, WATER AND AIR POLLUTION

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. Construction activities shall not be carried out during extended periods of wet weather unless measures are taken to control soil erosion and water pollution. Hauling of all materials, personnel, or equipment to, from or within the project shall be limited to those roads or work

areas actually needed. Erosion or pollution control or abatement work shall be carried out concurrently with regular construction activities to ensure that adequate control be in effect when adverse climatic conditions could create pollution or erosion problems. All items listed under this general heading shall be discussed with or approved by the Engineer.

Water Pollution

Soil erosion on construction sites or pollution of live streams, lakes, ponds, irrigation or drainage channels, or other water courses, will be prevented, controlled or reduced to acceptable limits. See the requirements for controlling stormwater runoff in the attached 1200c permit from Oregon State Department of Environmental Quality.

Work within channel or banks of creeks, ponds or lakes shall be prohibited or limited to the work area defined by the drawings. Turn areas, roads parking areas, temporary building sites, etc. shall not be constructed within the channel or banks but shall be placed at a distance so removed as to prevent any contamination of water or destruction of game or fish habitat. Where roads cross permanent streams, a suitable stream crossing as shown on the drawings shall be installed before the road is used.

Open fully exposed cut slopes, embankment slopes, or borrow areas shall be protected with permanent vegetation as soon as practical after slopes are finished or borrow areas are exhausted. Vegetation used shall be as specified under Permanent Vegetation section of these specifications. Fully exposed means that the surface will not be covered by impounded waters at any time.

When overwinter shutdowns occur, exposed areas will be adequately protected with temporary vegetation or organic mulch. Vegetation or mulching operations will be made as directed in the Permanent Vegetation section of these specifications.

Permanent Vegetation

Unless otherwise specified, a protective cover of vegetation shall be established on all disturbed areas.

Seedbed Preparation. A good seedbed shall be prepared on all areas to be protected by vegetation. Where low fertility soils are exposed, topsoil shall be used as needed and a seedbed prepared.

Seeding Mixtures. Approved grasses or grains as shown in Table 2 or seed mixtures approved by the Engineer should be seeded as soon as possible after construction is completed to assure the development of good protective growth before storm runoff begins.

Method of Seeding. A good seedbed should be prepared. Seeding shall be made by hand or machine broadcasting; and hand raked or harrowed to ensure that the seeding is mixed or has contact with surface soil. Seeding shall be made at right angles to the centerline of the spillway section for the bottom and interior slopes of the spillway section. On all other areas, seeding shall be made approximately on the contour.

Table 2. Permanent Vegetation

Minimum Seeding, Drill Rates 1/

Plant Variety	Lbs per Acre
Creeping Red Fescue	30
Meadow Foxtail	15
Tall Fescue	40
Nordan Crested Wheatgrass	16
Siberian Wheatgrass	16
Pubescent Wheatgrass	16
Intermediate Wheatgrass	16

1/ Broadcast seeding rates should be twice the recommended drill rates.

Seeding should be made soon after construction is completed. Seed in early spring - March 10 to April 15, or when soil temperatures reach 50 °F and soils are dry enough to be friable, or early fall - September 1 to October 1, when soil moisture is adequate.

Fertilizer. Apply 500 lbs. per acre of 16-20-0 commercial fertilizer or its equivalent at seeding time.

Mulching. Mulches needed to protect vegetative seedings during establishment shall be applied at the rate of 2 to 2-1/2 tons of grain straw or equivalent crop or plant residues per surface acre.

Straw or other residues shall be spread uniformly to cover the entire area to be protected. Where specified, the mulches shall be incorporated into the surface soil by discing or by punching with a cultipacking type device.

Mulches may be held in place with biodegradable meshes such as jute mesh or other material approved by the Engineer.

Irrigation. Irrigation shall be used for plant establishment as needed.

Temporary Vegetation

Where intermittent or temporary vegetation is needed and can be established until permanent vegetation can be installed. Table 3 shows seeding rates for temporary vegetation.

Table 3. Minimum Seeding Rates

Plant Variety	Lbs per Acre
Winter or Annual Rye	60
Winter Wheat or Barley	100

Method of Seeding. A good seedbed should be prepared. Seeding shall be made by hand or machine broadcasting; and hand raked or harrowed to ensure that the seeding is mixed or has contact with surface soil. Seeding shall be made at right angles to the slopes of the embankment. On all other areas, seeding shall be made approximately on the contour.

Seeding should be made soon after construction. Fall seeding should be made August 20 - September 30. Spring seeding may be made from April 1 to May 15 if there is ample moisture near the soil surface and seedbed is firm.

Fertilizer. Apply 300 pounds of 16-20-0 commercial fertilizer or its equivalent at seeding time.

Mulching. Mulching may not be needed. If needed, use mulch as indicated under permanent seeding.

Irrigation. Irrigation shall be used for plant establishment as needed.

Other Erosion Control Measures

Mulches can be used for temporary protection instead of temporary vegetation. Two to three tons per acre of hay, straw, wood chips, sawdust or barkdust should be applied evenly. Gravel or small rock shall be used on small steep, highly erodible soils to provide temporary protection when designated by the Engineer. Plastic sheeting securely anchored in place may be used in areas of high water concentrations and erosion potential.

Vegetative slopes of earth fills shall be protected from grazing and trampling of livestock by fencing. Plant residues from these areas can be used for dry forage production, green crop or mulches.

Temporary structures for interim control of diverted water shall be made of approved materials and shall be constructed at the locations and to the lines and grades shown on the drawings or as staked in the field.

Diversion ditches shall be placed at the top of exposed cut slopes or in other locations as shown on the drawings and/or staked in the field. Ditch cross sections shall be constructed to the neat lines and grades shown on the drawings and/or staked in the field.

Where needed, debris basins to retain sediment produced on the project construction site by storm runoff will be built at locations shown on the drawings and/or as staked in the field.

Chemical pollutants produced as a by-product of project work such as drained lubricating oils, transmission oils, greases, soaps, asphalt, etc. shall be contained and removed from the site for proper disposal or recycling. Construction equipment shall be staged in a location and manner to minimize air, soil and water pollution. All fuel and lubricants shall be stored in containers and areas that are in conformance with the Oregon State Department of Environmental Quality and local regulations. If a spill of chemical pollutants such as fuel or hydraulic fluid should occur, immediately attempt to contain the spilled material. The following procedures shall be followed:

(a) For spillage on land, construct earthen berms or use other suitable barricade material of sufficient size to contain the spill and keep it from spreading.

(b) For spillage on water, attempt to isolate and contain the spilled material. Commercial booms or other suitable materials shall be kept on site during construction to contain fuel and oil spills on water.

(c) Call the Oregon Emergency Response System (ORES) at (800) 452-0311.

Sanitary facilities such as chemical toilets shall be located at least 100 feet from water bodies to prevent contamination of surface or subsurface water.

Air Pollution

Local and state regulations concerning brush slash burning shall be adhered to. In lieu of burning, chipping of all the larger wood residues is encouraged. Wood chips can be utilized for mulching.

Fire prevention measures shall be taken to prevent the start of fires or the spread of fires

started as a result of project work. Fire breaks or guards shall be constructed at suitable locations.

All permanent, access, or haul roads used during construction shall be sprinkled as needed to fully suppress dust, which may be produced by such use.

BASIS OF ACCEPTANCE

The acceptability of the project shall be determined by field inspections to check compliance with all provisions of this specification with respect to the drawings and minimum installation requirements.

In order to certify the project meets the requirements of the drawings and specifications, the following items will be inspected and documented during construction:

1. Compaction tests showing the embankment and compacted soil liner meets compaction requirements.
2. Elevations and dimensions of embankment and storage area.

High Caliber Transloading & Storage
Wastewater Storage Pond
Operation and Maintenance Guidelines

The wastewater storage pond operated by High Caliber Transloading & Storage used to store wastewater containing leachate and other pollutants generated by the silage pits and truck washout areas. The operating storage capacity of the wastewater pond is 7.02 acre feet and is estimated to provide 209 days of storage for a normal weather year and 170 days considering the addition of a 25 year-24 hour storm event.

Emptying of the wastewater storage pond should begin in the spring and continue through the spring and summer months as weather conditions permit. The wastewater stored in the pond should be analyzed during the first year of operation to determine the concentrations of nutrients. The concentration of nutrients in the wastewater and the nutrient uptake of the crops being grown should be used to determine the application amount that can be applied to the crop land fields.

To function properly and have the greatest management flexibility, the wastewater storage pond 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 pond must be removed to maintain design capacity and applied to the crop land fields considering the concentration of nutrients in the wastewater and the nutrient uptake of the crops being grown.

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 ponds embankment is found to be compromised, immediately draw the wastewater 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 pond 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.

Do not permit livestock access to the pond or on pond 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 the wastewater storage pond. It is against the law to do so.

PROJECT DESCRIPTION

The wastewater pond for High Caliber Transloading and Storage is designed to capture runoff and leachate from silage stored in the silage pits. The wastewater storage pond is planned to be constructed in an area where a wastewater storage pond was previously constructed and decommissioned. The planned wastewater storage pond will consist of a 6 foot high embankment constructed from material excavated from the storage area of the pond. The embankment for the pond will have a 10 foot top width and 3 to 1 inside side slopes and 2 to 1 outside side slopes. A 1 foot compacted soil liner treated with a environment soil sealant is planned to reduce any seepage from the pond to less than $1x10^{-7}$ cm/sec.

GENERAL NOTES

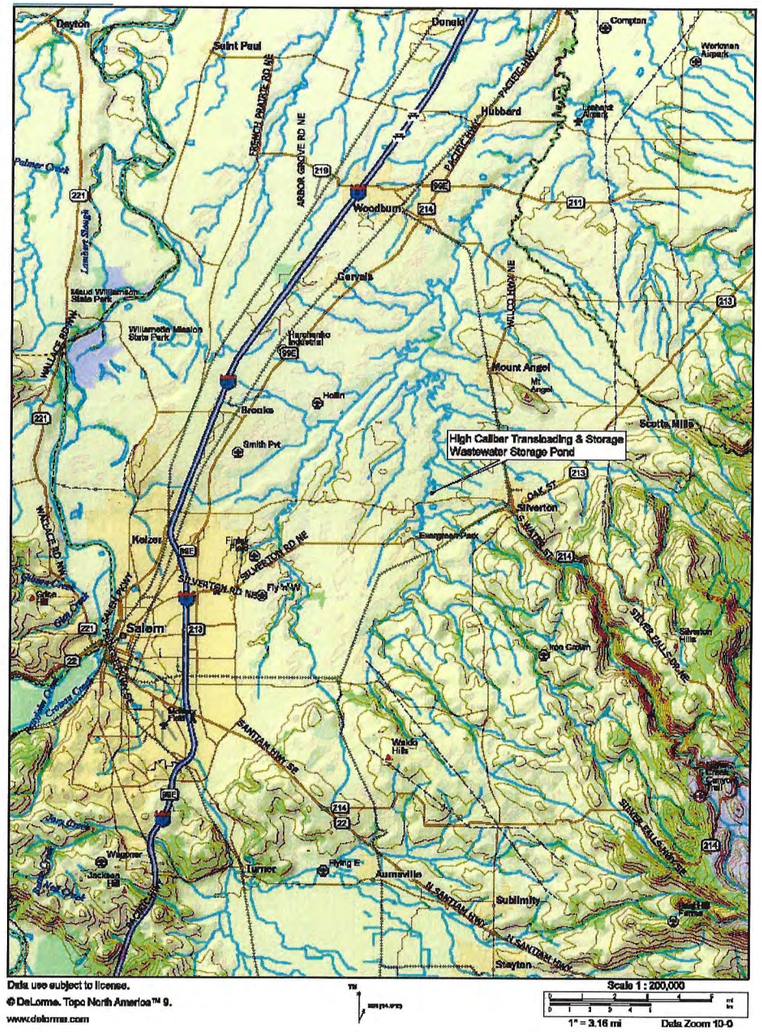
The owner is responsible for obtaining and complying with all permits related to the construction and operation of this project.

No representation as to existence or non–existence of utilities, public or private is made. It is the responsibility of the contractor to comply with provisions of ORS 757.541 and 757.571 and to determine the location of utilities (1–800–332–2344). The contractor will be liable for any damage resulting from disruption of service caused by construction activities.

The contractor shall be responsible for on site construction activities and safety of all personnel during construction. These drawings and associated specifications are not intended to provide means or methods of construction.

The following items must be documented during construction in order to show the waste storage pond meets the requirements of the drawings and specifications and can be approved:

1. Compaction tests showing the embankment and compacted soil liner meets compaction requirements.
2. Elevation and dimensions of embankments and storage areas.
3. Documentation that the soil liner was completed as designed.



LOCATION MAP

SE¼, Section 6, T6S, R1W from the Willamette Meridian

INDEX OF DRAWINGS

Sheet Number	Subject
1	Project Description, General Notes and Location Map
2	Plan View, Area–Capacity Curve and Design Data
3	Profile on Centerline of Embankment
4	Cross Section A–A of Embankment and Storage Area

REGISTERED PROFESSIONAL ENGINEER
12,954
OREGON
JULY 26, 1985
BRUCE D. WILSON

SIGNED:05/29/2019

EXPIRATION DATE: 6/30/2020

High Caliber Transloading & Storage Wastewater Storage Pond

COVER PAGE

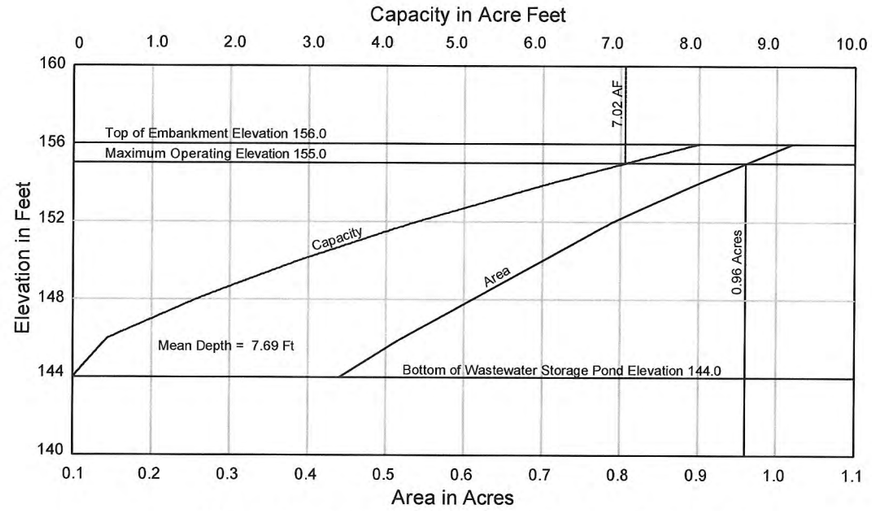
Marion County, Oregon

H & R Engineering LLC
KEIZER, OREGON

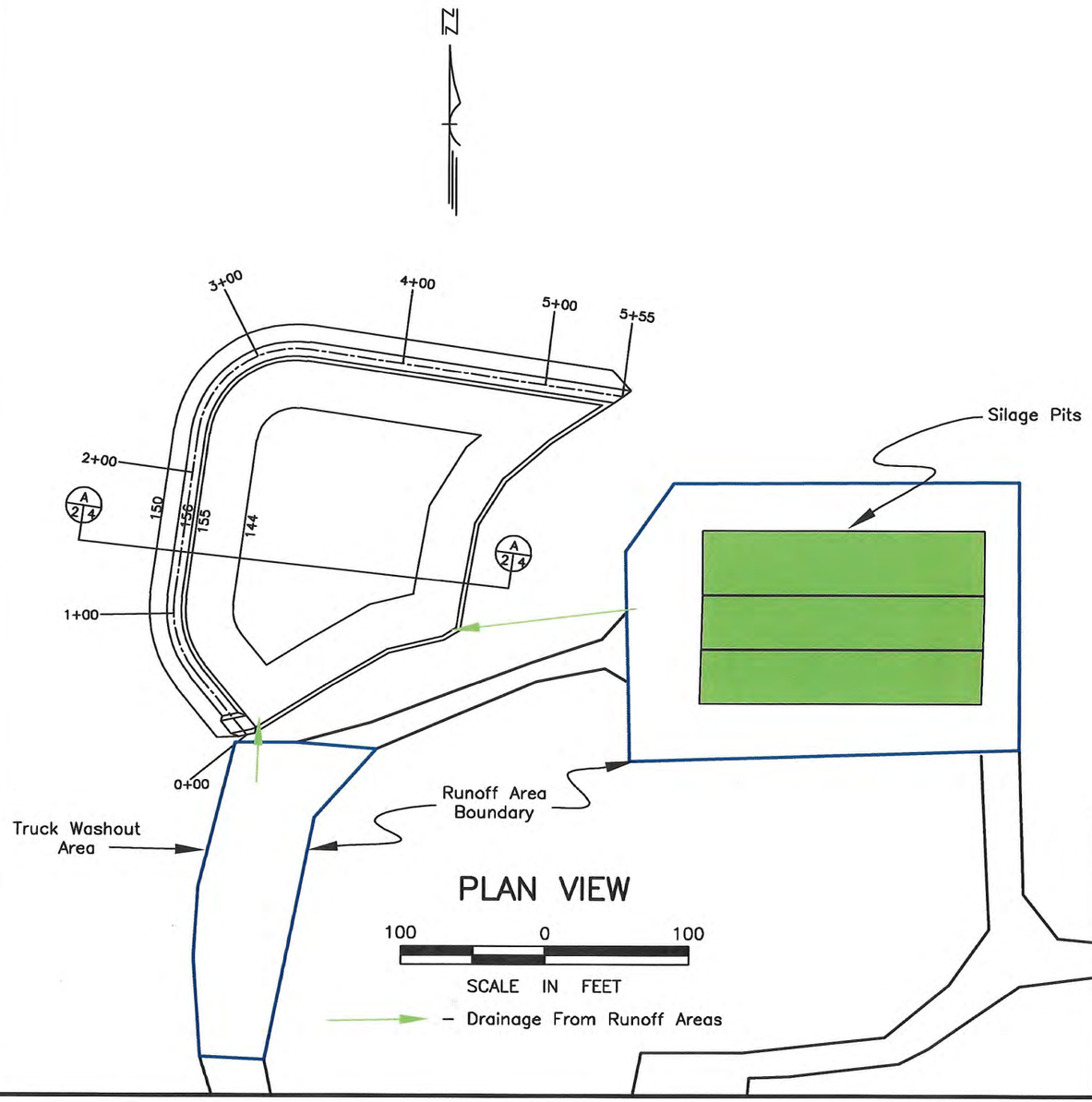
DESIGNED BY: B. Wilson
DRAWN BY: B. Wilson

DRAWING NO.: HCTS01

May 2019
Sheet 1 of 4



WSP3 AREA–CAPACITY CHART



WASTEWATER STORAGE POND (WSP):
- Operating Capacity____7.02 Acre Feet
- Surface Area_____0.90 Acres
- Mean Depth_____7.69 Feet

WSP EMBANKMENT:
- Height_____6.0 Feet
- Top Width_____10.0 Feet
- Length_____555 Feet
- Compacted Fill_____3,959 Cubic Yards
- Shrinkage Factor_____1.4

MISCELLANEOUS VOLUMES:
- Foundation Stripping___2,129 Cubic Yards

DESIGN DETAILS

REGISTERED PROFESSIONAL ENGINEER
12,954
OREGON
JULY 26, 1985
BRUCE D. WILSON

SIGNED: 05/29/2019

EXPIRATION DATE: 6/30/2020

High Caliber Transloading & Storage
Wastewater Storage Pond
PLAN VIEW AND DETAILS

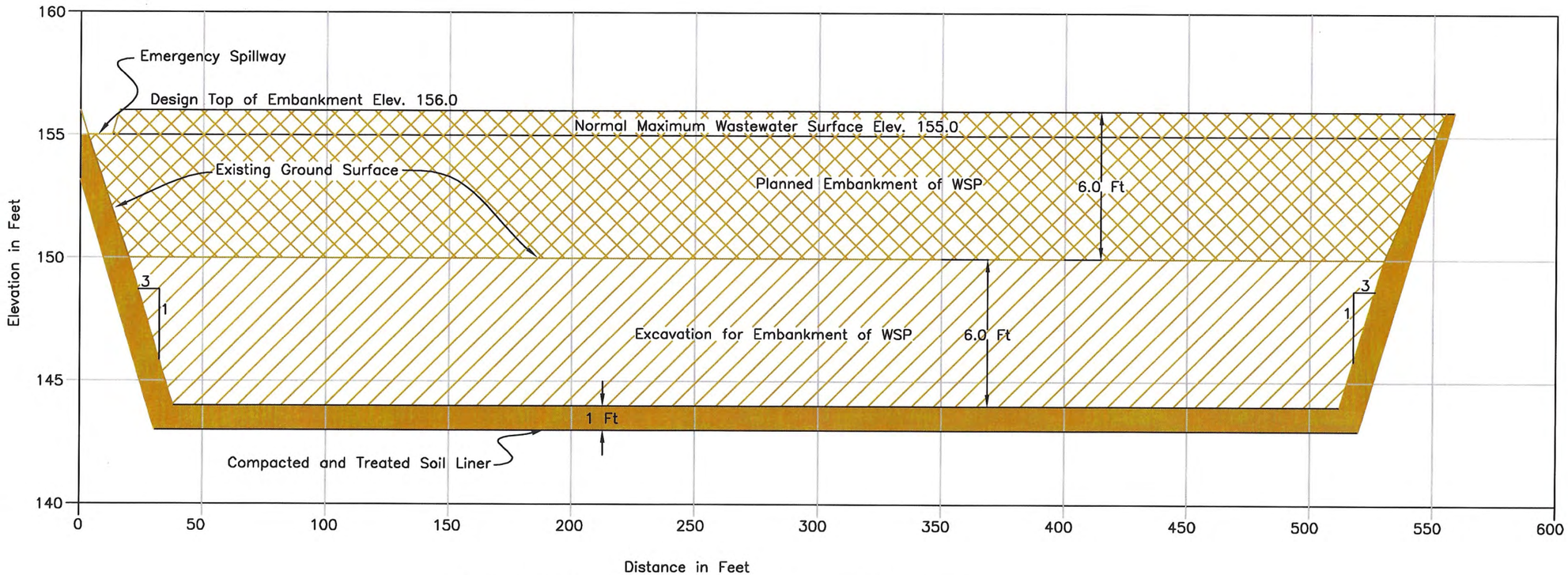
Marion County

H & R Engineering LLC
KEIZER, OREGON

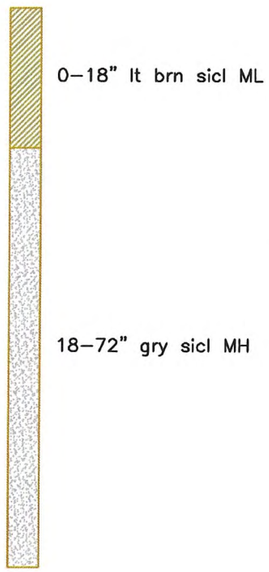
DESIGNED BY: B. Wilson
DRAWN BY: B. Wilson

DRAWING NO.: HCTS02

May 2019
Sheet 2 of 4



PROFILE ON CENTERLINE OF EMBANKMENT



Test Pit

REGISTERED PROFESSIONAL ENGINEER
12,954
OREGON
JULY 26, 1985
BRUCE D. WILSON

SIGNED: 05/29/2019

EXPIRATION DATE: 6/30/2020

High Caliber Transloading & Storage
Wastewater Storage Pond
PROFILE ON CENTERLINE OF EMBANKMENT

Marion County, Oregon

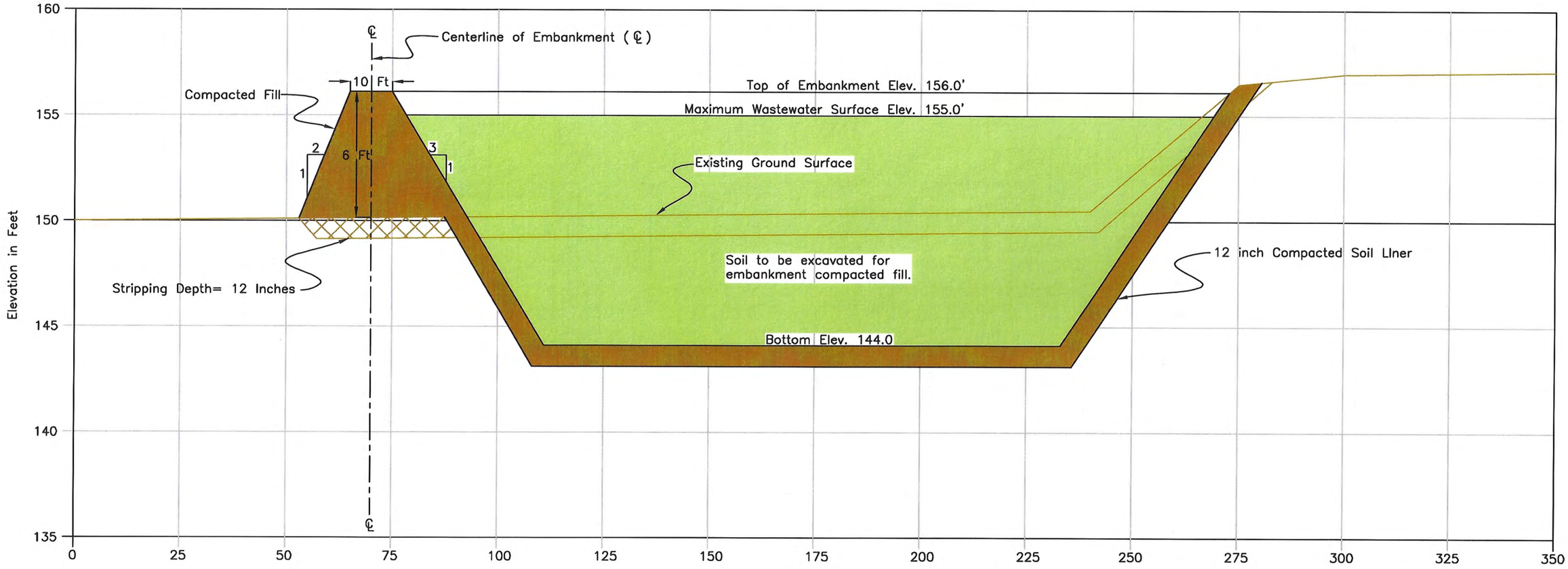
H & R Engineering LLC

KEIZER, OREGON

DESIGNED BY: B. Wilson
DRAWN BY: B. Wilson

DRAWING NO.: HCTS03

May 2019
Sheet 3 of 4



A/2.4 CROSS SECTION OF EMBANKMENT

REGISTERED PROFESSIONAL ENGINEER
12,954
OREGON
JULY 26, 1985
BRUCE D. WILSON

SIGNED: 05/29/2019

EXPIRATION DATE: 6/30/2020

High Caliber Transloading & Storage
Wastewater Storage Pond
CROSS SECTION A-A OF EMBANKMENT

Marion County, Oregon

H & R Engineering LLC

KEIZER, OREGON

DESIGNED BY: B. Wilson
DRAWN BY: B. Wilson

DRAWING NO.: HCTS04

May 2019
Sheet 4 of 4

From: Will McGill Surveying LLC

15333 Pletzer Rd. SE

Turner, OR 97392

Cell: (503) 510-3026

June 2, 2020

To: Ben Krahn, Oregon Department of Agriculture

635 Capitol St. NE

Salem, OR 97301

Re: High Caliber Transloading & Storage, Wastewater Storage Pond

11039 Hazelgreen Rd. NE, Silverton, OR 97381

On June 2, 2020, Will McGill and Grant McGill met Jeremy Zuidema, owner, at the subject site to do an interview and as-built survey of the wastewater storage pond. The pond is located in the SE ¼ SW ¼ and SW ¼ SE ¼ of Section 29, Township 6 South, Range 1 West of the Willamette Meridian. Using survey-grade GPS equipment, we took readings on the constructed pond embankment at the water surface, top inner edge, top outer edge, and base of the outside slope. From the onsite survey and interview, we have determined the following:

Embankment top average width = 15'

Embankment inside slope = 3:1

Embankment outside slope = 2:1

Pond capacity = 7.6 acre-feet

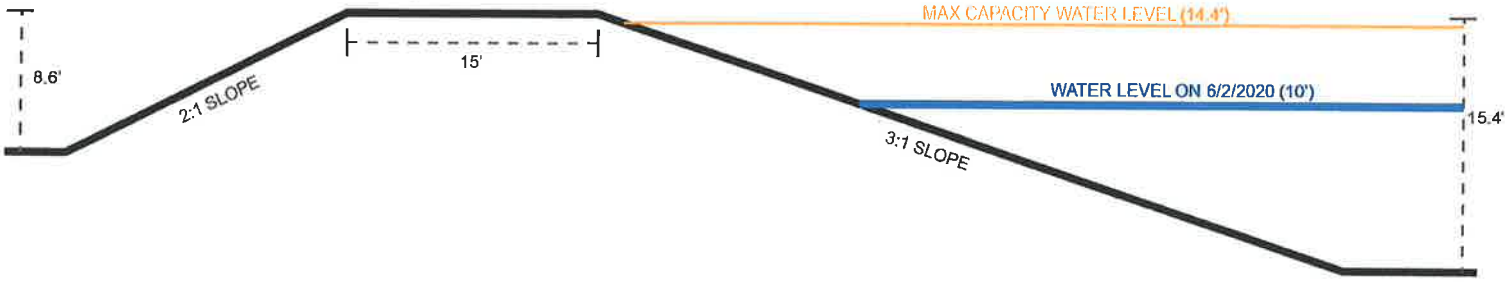
William E. McGill, PLS, CWRE

HIGH CALIBER TRANSLOADING & STORAGE
WASTEWATER STORAGE POND

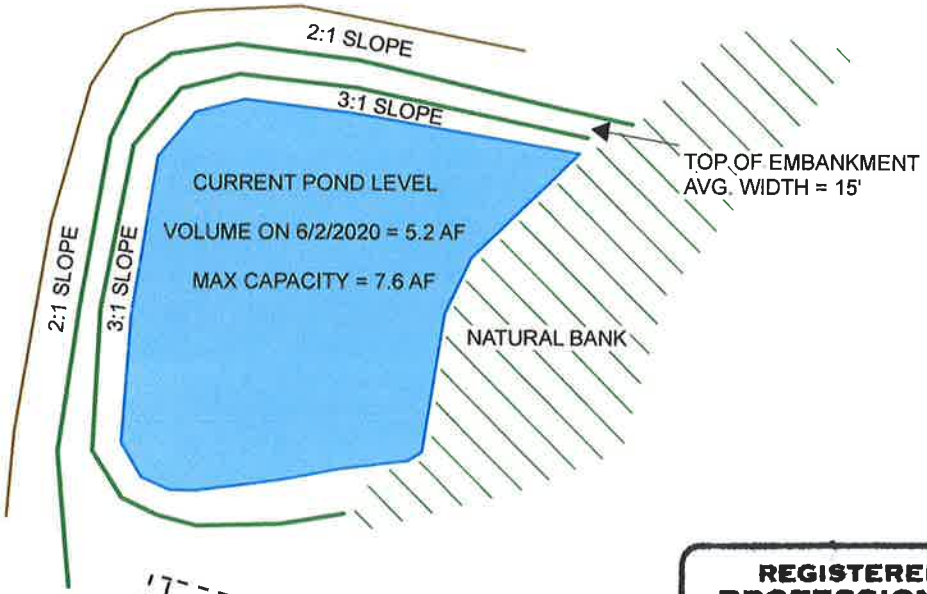
11039 HAZELGREEN RD. NE
SILVERTON, OR 97381

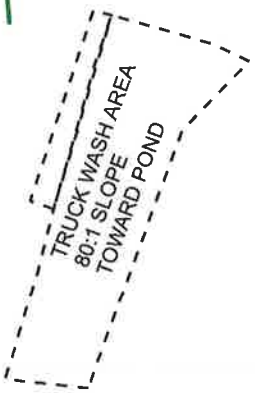
ONSITE INSPECTION: JUNE 2, 2020

CROSS SECTION



PLAN VIEW





N

REGISTERED
PROFESSIONAL
LAND SURVEYOR

William E. McGill

OREGON
JULY 13, 1973
WILLIAM E. McGILL
995

EXPIRES: 12/31/2020

WILL MCGILL SURVEYING LLC | 15333 Pletzer Rd. SE | 503-510-3026 | Turner, OR 97392 | willmcgill.surveying@gmail.com

OREGON DEPARTMENT OF AGRICULTURE

CONFINED ANIMAL FEEDING OPERATION ANIMAL WASTE MANAGEMENT PLAN OR NUTRIENT MANAGEMENT PLAN AMENDMENT FORM

BSP Inc.
Confined Animal Feeding Operation

Dave Bielenberg
CAFO Operator's Name

11144 Hazelgreen Road, Silverton, OR 97381
Facility Street Address, City, State, Zip

503-873-2710
Phone Number

Submitted to the Oregon Dept. Of Agriculture are the following modifications to Animal Waste Management Plan (AWMP)/Nutrient Management Plan (NMP) # 4208.

I would like to apply the following modifications to this AWMP/NMP:

Remove the old feed yard located on north side of Hazelgreen from NMP.

Operator's Signature

02/17/2026
Date

CONCLUSION: X Approved _____ Denied

Inspector's Signature

Official Use:

MA# _____ Effective date: _____

Date copy sent to Operator: _____