

U.S. Department of Agriculture
Natural Resources Conservation Service

EXCEL Spread sheet
Version 1200b

FILE NAME wsp1211a.xls

JOB NO. WA:

STATE WA PROJECT Farm
BY 0 DATE 1/26/2018
SUBJECT Waste Management

CHECKED BY

DATE
SHEET 1 of 6

SUMMARY SHEET

Annual Rainfall (inches) 48.0 MILK PRODUCTION 70
(ave. lbs/cow/day)

HERD INVENTORY

| | No. of Animals | Aver. Wt (lbs.) | Animal Units (1,000 lb) |
|---------------------------|----------------|-----------------|-------------------------|
| Milking Cow | 0 | 1,200 | 0.0 |
| Dry Cows | 0 | 1,400 | 0.0 |
| Heifers 12-24 | 200 | 900 | 180.0 |
| Heifers 0-12 | 200 | 300 | 60.0 |
| Total Animal Units | | | 240.0 |

CROP/FIELD INVENTORY

| | FIELD NUMBER | | | | | | | | | |
|----------------------------|--------------|------|-------|-------|----|----|----|----|----|----|
| CROP DATA | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| ACRES | 68.7 | 4.7 | 25.2 | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| CROP | Grass | Corn | Grass | Grass | 0 | 0 | 0 | 0 | 0 | 0 |
| YIELD (T/AC) | 6 | 23 | 5 | 4.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| N REQ. (LB/UNIT WT) | 50 | 9 | 50 | 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| P REQ. | 7.5 | 1.5 | 7.5 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| K REQ. | 40 | 6.8 | 40 | 40 | 0 | 0 | 0 | 0 | 0 | 0 |
| FIELD NUTRIENT BAL. | | | | | | | | | | |
| N - Pounds Required | 20,610 | 973 | 6,300 | 8,325 | - | - | - | - | - | - |
| N - Pounds Available | 12,245 | 658 | 4,032 | 4,958 | - | - | - | - | - | - |
| P - Pounds Required | 3,092 | 162 | 945 | 1,249 | - | - | - | - | - | - |
| P - Pounds Available | 2,099 | 58 | 464 | 386 | - | - | - | - | - | - |
| K - Pounds Required | 16,488 | 735 | 5,040 | 6,660 | - | - | - | - | - | - |
| K - Pounds Available | 5,179 | 201 | 1,615 | 1,344 | - | - | - | - | - | - |
| N (Percent of required) | 59% | 68% | 64% | 60% | 0% | 0% | 0% | 0% | 0% | 0% |
| P (Percent of required) | 68% | 36% | 49% | 31% | 0% | 0% | 0% | 0% | 0% | 0% |
| K (Percent of required) | 31% | 27% | 32% | 20% | 0% | 0% | 0% | 0% | 0% | 0% |
| Estimated Min. Acs. Req | 27 | 2 | 10 | 10 | - | - | - | - | - | - |

WASTE APPLICATION SCHEDULE

| Month | Waste Prod. (gal) | Storage Volume (gal) | Application | | | |
|----------------------|-------------------|----------------------|------------------|--------------|------------|-----------------|
| | | | Vol Spread (gal) | Field number | Area (ac.) | Depth (in./ac.) |
| Carryover | | 0 | | | | |
| October | 218,175 | 218,175 | 0 | 0 | 0 | 0.00 |
| November | 260,620 | 478,795 | 0 | 0 | 0 | 0.00 |
| December | 285,536 | 764,330 | 0 | 0 | 0 | 0.00 |
| January | 254,400 | 1,018,731 | 0 | 0 | 0 | 0.00 |
| February | 214,398 | 1,233,129 | 0 | 0 | 0 | 0.00 |
| March | 190,814 | 773,943 | 650,000 | 2,3,4 | 100 | 0.24 |
| April | 164,337 | 938,280 | 0 | 0 | 0 | 0.00 |
| May | 141,194 | 629,473 | 450,000 | 1,5,6 | 51 | 0.32 |
| June | 117,524 | 746,997 | 0 | 0 | 0 | 0.00 |
| July | 86,995 | 33,992 | 800,000 | 1,2,3,4,5 | 140 | 0.21 |
| August | 111,666 | 145,658 | 0 | 0 | 0 | 0.00 |
| September | 157,197 | 0 | 302,855 | 2,3,4 | 100 | 0.11 |
| TOTAL VOLUMES | 2,202,855 | | 2,202,855 | | | |

NITROGEN BALANCE

| | |
|--|--------------|
| Crop Area Available for Nutrient Application | 136 acres |
| Min. Crop Acres Required for N Balance | 49 acres |
| Animal Density | 1.8 AU/Acre |
| Est. Maximum Density | 4.9 AU/Acre |
| | 1.3 Cow/Acre |
| | 3.5 Cow/Acre |

| | N | P | K |
|---|------|------|------|
| Estimated Nutrients in Liquid (Lb/1000 gal.): (Net after storage losses) | 6.9 | 1.2 | 3.9 |
| Estimated Nutrients Retained in Solids (wet) | 0.4% | 0.1% | 0.1% |
| Estimated Nutrients in Solids (Lb/T w.b.): (Net after storage losses) | 5.8 | 2.6 | 1.2 |

DATE
SHEET 2 of 6

| | No. of Animals | Aver. Wt. (lbs.) | Animal Units (1,000 lb.) | Nutrient and Manure Production (lbs./day/1000 lb. animal unit) | | | | |
|---------------------------|----------------|------------------|--------------------------|--|-------------|-------------|-------------|------------|
| | | | | N | P | K | Manure | Solids |
| Milking Cows | | 1,200 | 0.0 | 0.70 | 0.08 | 0.32 | 105.80 | 13.37 |
| Dry Cows | | 1,400 | 0.0 | 0.30 | 0.04 | 0.10 | 51.00 | 6.60 |
| Heifers 12-24 | 200 | 900 | 180.0 | 0.27 | 0.05 | 0.12 | 56.00 | 8.50 |
| Heifers 0-12 | 200 | 300 | 60.0 | 0.42 | 0.05 | 0.11 | 83.00 | 9.20 |
| Total Animal Units | | | 240.0 | 0.31 | 0.05 | 0.12 | 62.8 | 8.7 |

| | RETAINED AFTER STORAGE | | |
|---------|------------------------|-----|-----|
| | N | P | K |
| Liquids | 65% | 85% | 90% |
| Solids | 80% | 90% | 90% |

| | |
|--------------|------------|
| Stat. Number | 8 |
| Station Name | Clearbrook |

| | |
|-----------------------|--|
| (AVE. RES/CC (m/day)) | |
| 70 | |

| | | Gal/year | cu-ft/yr. | lbs./yr. |
|--|--------|-----------|-----------|------------|
| Annual Rainfall (inches) | 48 | ----- | | |
| Annual Pond Evaporation (in.) | 18 | ----- | | |
| Wash Water (gal/cow/day) | | - | | - |
| Concrete Slab Area (sq. ft.) | 30,700 | 918,495 | | 7,660,247 |
| Roof Area Collected (sq. ft.) | 13,300 | 397,915 | | 3,318,609 |
| Existing Pond Area Collected (sq. ft.) | 2,930 | 54,788 | | 456,933 |
| Flush water (gal/day) | | - | | - |
| Bedding (lb./AU/day) | 3 | 88,561 | 11,840 | 219,000 |
| Bedding Unit Weight (lb./cu.ft.) | 9 | | | |
| Manure Collected | | 670,400 | 89,626 | 5,592,638 |
| Rain Less Evaporation into Holding Pond | | 172,330 | | 1,437,232 |
| Average Annual Waste Produced | | 2,302,489 | | 18,684,659 |
| Solids in liquid before separation (w.b.) | | 5.2% | 21,754 | 978,930 |
| Separator Efficiency (TS removed) | 0% | - | - | - |
| % Solids after separation and/or dry storage | | 2.1% | | 379,530 |
| Est. Density of Sep. Solids (lb./cu-ft) | 45 | | | |
| Manure Collected and Handled as solid (cu-ft/yr) | | 73,863 | 13,320 | 599,400 |
| Liquid waste volume | | 2,228,625 | | 18,085,259 |
| Solid Waste volume | | 73,863 | 13,320 | 599,400 |

| | N | P | K |
|--|------|------|------|
| Estimated Nutrients in Liquid (Lb/1000 gal.): (Net after storage losses) | 6.9 | 1.2 | 3.9 |
| Estimated Nutrients Retained in Solids (% wet wt.) | 0.4% | 0.1% | 0.1% |
| Estimated Nutrients in Solids (lb./ton, wet): (Net after storage losses) | 5.8 | 2.6 | 1.2 |

| STATION NUMBER | TOWN | COUNTY | ANNUAL PRECIP. |
|-------------------|----------------|-----------|-------------------|
| 1 | Aberdeen | G Harbor | 83.01 |
| 2 | Anacortes | Skagit | 25.64 |
| 3 | Battleground | Clark | 51.4 |
| 4 | Bellingham | Whatcom | 35.61 |
| 5 | Blaine | Whatcom | 40.73 |
| 6 | Buckley | Pierce | 48.72 |
| 7 | Centralia | Lewis | 46.05 |
| 8 | Clearbrook | Whatcom | 46.52 |
| 9 | Concrete | Skagit | 67.29 |
| 10 | Elma | G Harbor | 67.22 |
| 11 | Everett | Snohomish | 36.71 |
| 12 | Grays River | Wahkiakum | 109.6 |
| 13 | Longview | Cowlitz | 45.56 |
| 14 | Monroe | Snohomish | 48.54 |
| 15 | Mount Vernon | Skagit | 31.89 |
| 16 | Oakville | Thurston | 57.16 |
| 17 | Olympia | Thurston | 50.94 |
| 18 | Packwood | Lewis | 55.54 |
| 19 | Port Angeles | Clallam | 25.2 |
| 20 | Puyallup | Pierce | 40.08 |
| 21 | Raymond | Pacific | 79.25 |
| 22 | Sedro Woolley | Skagit | 46.06 |
| 23 | Sequim | Clallam | 16.4 |
| 24 | Snoqual. Falls | King | 60.82 |
| 25 | Toledo | Lewis | 45.5 |
| 26 | Vancouver | Clark | 38.95 |

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U.S. Department of Agriculture
Natural Resources Conservation Service

EXCEL Spread sheet
Version 1200b

FILE NAME
JOB NO.

wsp1211a.xls
WA:

STATE WA PROJECT Farm
BY 0 DATE 1/29/2018
SUBJECT Waste Management

CHECKED BY

DATE
SHEET 4 of 6

WASTE HOLDING POND

| | |
|-----------------------------------|-----|
| Est. soil compaction factor | 25% |
| Pond Factor of Safety | 0% |
| 25 Yr./ 24 hr Rain on Pond (Inch) | 3.5 |

| Pond Parameters | Feet | Cubic Yds | Gallons |
|---------------------------------|------|------------|------------------|
| Inside Top Length | 96 | | |
| Inside Top Width | 96 | | |
| Inside Side Slope (x:1) | 0.0 | | |
| Outside Side Slope (x:1) | 0.0 | | |
| Freeboard | 1.0 | | 68,936 |
| Dead Storage Depth | 1.0 | | 68,936 |
| Dike Top Width | 0.1 | | |
| Liner Thickness | 0.0 | 0 | |
| Average Ground Surface EL. | 50.0 | | |
| Low Ground Surface EL. @ Dike | 50.0 | | |
| Pond Top EL. | 76.0 | | |
| Pond Bottom EL. (Before Liner) | 50.0 | | |
| Stripping Depth | | 0 | |
| 25 Yr./ 24 hr Runoff from field | | 0 sq.ft. | 0 |
| Maximum Dike Height | 26.0 | | |
| Average Dike Height | 26.0 | 46 | |
| Excavation Depth (Before Liner) | 0.0 | 0 | |
| Pond Bottom EL. (After Liner) | 50.0 | | |
| Cut/Fill Ratio | | 0.00 | |
| 25 Yr./ 24 hr Rain on Pond | | 0.29 | 20109 |
| Outside Bottom Length | 96 | | |
| Outside Bottom Width | 96 | | |
| Above ground Pond Volume | | 5.50 ac-ft | |
| Gross Pond Volume | | | 1,792,328 |
| Net Pond Volume | | | 1,634,347 |
| Additional Storage Volume | | | 287,000 |
| Total net waste storage | | | 1,921,347 |

| TOWN | 25Yr/24Hr PRECIP. |
|------------|----------------------|
| Bellingham | 3.10 |
| Ferndale | 3.30 |
| Blaine | 3.60 |
| Lynden | 3.70 |
| Sumas | 3.80 |
| Deming | 3.80 |
| Acme | 3.70 |
| Glacier | 4.50 |
| Kendall | 3.80 |
| Laurel | 3.50 |
| Everson | 3.50 |

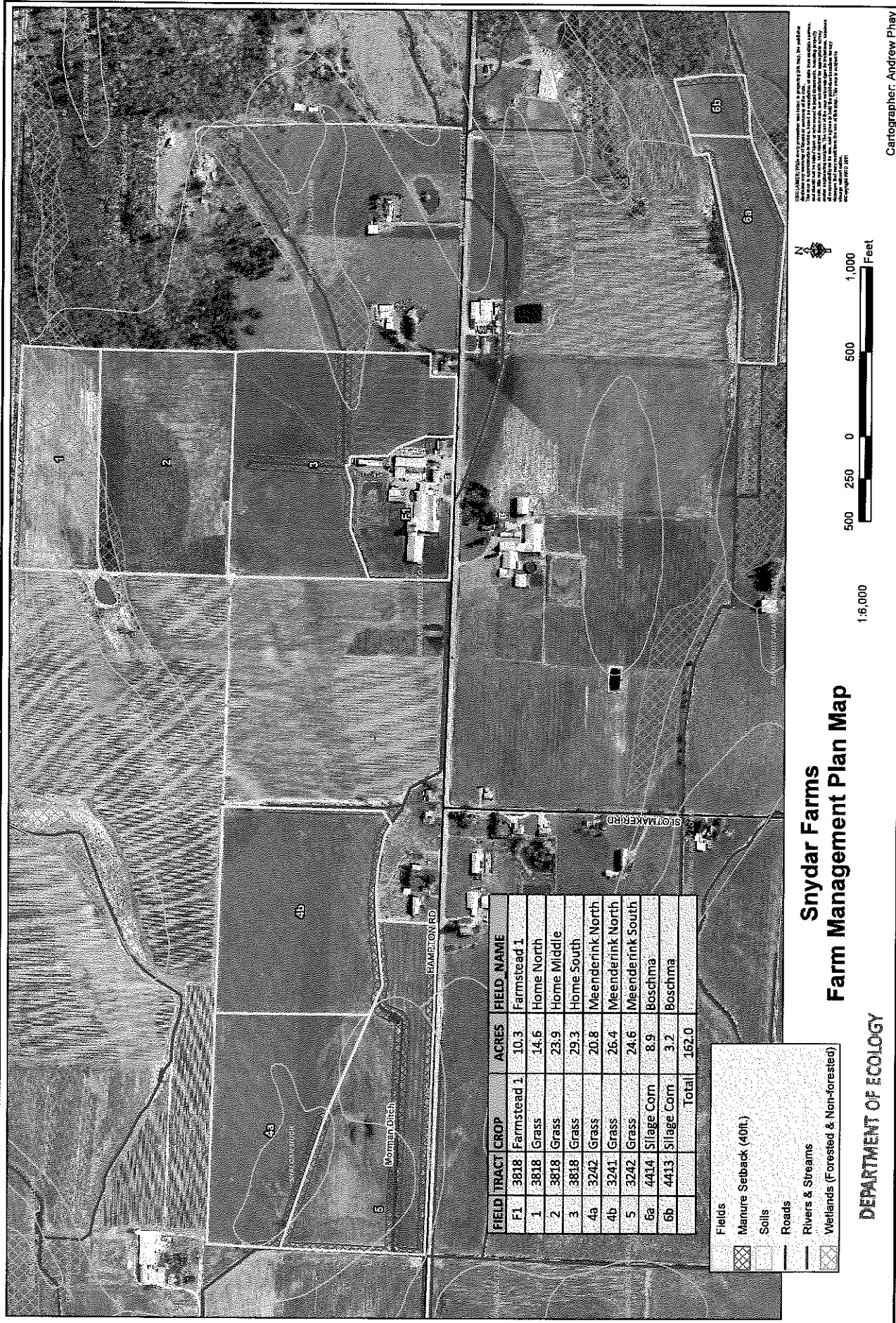
SUMMARY

| | |
|-------------------------|----|
| Total Excavation (c.y.) | - |
| Total Fill (c.y.) | 46 |

#REF! additional lagoons
same size

WASTE APPLICATION SCHEDULE

| Month | Waste Prod. (gal) | Storage Volume (gal) | Application | | | |
|----------------------|-------------------------|----------------------------|---------------------|-----------------|---------------|--------------------|
| | | | Vol Spread (gal) | Field number | Area (ac.) | Depth (in./ac.) |
| Carryover | | 0 | | | | |
| October | 218,175 | 218,175 | | | | 0.00 |
| November | 260,620 | 478,795 | | | | 0.00 |
| December | 285,536 | 764,331 | | | | 0.00 |
| January | 254,400 | 1,018,731 | | | | 0.00 |
| February | 214,398 | 1,233,129 | | | | 0.00 |
| March | 190,814 | 773,943 | 650,000 | 2,3,4 | 97 | 0.25 |
| April | 164,337 | 938,280 | | | | 0.00 |
| May | 141,194 | 629,474 | 450,000 | 1,5,6 | 34 | 0.48 |
| June | 117,524 | 746,998 | | | | 0.00 |
| July | 86,995 | 33,993 | 800,000 | 1,2,3,4,5 | 122 | 0.24 |
| August | 111,666 | 145,659 | | | | 0.00 |
| September | 157,197 | 0 | 302,856 | 2,3,4 | 97 | 0.12 |
| TOTAL VOLUMES | 2,202,856 | | 2,202,856 | | | |



FILED 05 2018

WATER QUALITY PROGRAM

Snyder Farms

Farmstead - 2017

200 ft



Vegetated Buffer

Waste Storage Pond
(Decommissioned)

Waste Storage
Tank - 1.8M

North lot

Sump
pump

Silage bunkers

Manure
Pit

Calf
Hutches

Tank

South lot

Manure Dry Stack

Google Earth

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Hampton Rd