M & P Project No. 14-160

# -WATER QUALITY TRADING PLAN (WQTP)-

for

City of Greenwood Wastewater Treatment Facility

City of Greenwood Wisconsin

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## SECTION I - INTRODUCTION

### A. EXECUTIVE SUMMARY:

The City of Greenwood will implement a Water Quality Trading Plan to comply with the phosphorus limit requirements of the WPDES Permit. The City proposes a trade with area farmers to reduce their phosphorus runoff. Multiple properties will be included in this trade to generate the required credits. This trade will focus on the whole field management approach with an active dairy farmer and also conversion of row crop fields to permanent perennial vegetation with a retiring dairy farmer and absentee landowner.

The phosphorous discharged in effluent by the Greenwood WWTF is heavily influenced by a dairy located within the City; the Dairy is operated only when there is an oversupply of milk to Grassland Dairy. When the Dairy is not in operation, the City can discharge effluent at 0.3mg/L. total phosphorous. If the Dairy is operating with a continuous discharge, the City's WWTF effluent will be in the range of 0.6-0.8 mg/L. total phosphorous. In 2017 the Dairy was not operated on a consistent basis. The City effluent averaged 0.379 mg/L, with a total discharge of 500 pounds of phosphorous. In 2016, the Dairy operated on a more continual basis causing the City to discharge 773 pounds of phosphorus. The average effluent concentration of phosphorus was 0.56 mg/l.

For the purposes of this report the 2016 phosphorus discharge will be used in the calculations, it is more consistent with the past operation of the Dairy. The final WPDES discharge limit will be 103 pounds, if no improvements can be made in WWTF phosphorus reduction, the City will need to mitigate 773 – 103 = 670 pounds of phosphorus through Water Quality Trading.

**Assuming a trading ratio of 1.2:1 is required; the phosphorus credits needed will be 1.2 x 670 = 804 pounds of phosphorus runoff reduced from the watershed. This is assumed to be the maximum amount of credits needed.** The City will obtain additional phosphorous credits in the event that the Dairy runs continuously in the future, or there is a practice failure with one of the trading partners. The following trading partners will generate:

| TRADING PARTNER | TRADEABLE PHOSPHOROUS |
|---|---|
| **Malm farm- see section C1:** | **918 pounds average per year** |
| **Patti Suda - see section C2:** | **60 pounds average per year** |
| **Wayne Riethmiller - see section C3:** | **153 pounds average per year** |
| **TOTAL** | **1131 POUNDS AVE. PER YEAR** |

### B. BACKGROUND AND NEED:

(Please refer to the previous phosphorous compliance reports for a more complete discussion).

The City of Greenwood's WWTF is considered a Regional Facility in that it also treats the wastewater from the City of Loyal. Additionally, the Greenwood WWTF receives pretreated wastewater from Greenwood Milk Products, owned by Grassland Diary, plus septage and trucked in wastewater. Greenwood's WWTF has little control over the residential influent, but is working with Greenwood Milk Products to improve the quality of the pretreated wastewater that is received from the Dairy. The City has a longstanding Agreement with the Dairy that addresses flow and wastewater strength. That Agreement has undergone numerous updates and amendments. Currently the Dairy is operating under an expired Agreement. The City and Dairy are working together to amend the Agreement to provide financial incentives to the Dairy to optimize phosphorus treatment.

Previous reports investigated influent: flow, SS, BOD and phosphorus, to predict WWTF capability and response regarding phosphorous removal. It is difficult, if not impossible, to single out an individual component that is controlling. Since the waste stream from Greenwood Milk Products is variable as is the influent flow from Greenwood and Loyal, the best that can be expected is to identify a general trend of one or more components that significantly affect the effluent phosphorus concentration. Please refer to Attachment D of the 4th Report. The City will continue to monitor the influent wastewater components that are shown on the graphs to maximize treatment.

The Greenwood WWTF has a maximum monthly design flow of 0.75 MGD and 1869 pounds of BOD. No information is available on the design capacity for suspended solids or phosphorus. However, past practice indicates that Greenwood's WWTF can achieve a 0.3 mg/l average of phosphorous when Greenwood Milk Products is not operating. If the City met 0.3 mg/l phosphorus in the effluent only 375 pounds of phosphorus credits would be required through WQT to meet the final WPDES limit.

## SECTION II - WATER QUALITY TRADING

### A. PURPOSE:

**This Water Quality Trading Plan for phosphorous will be used by the City of Greenwood to comply with future WPDES permit requirements for effluent phosphorous.** The City will continue to discharge to the Black River, but will offset the discharge limit exceedances for phosphorous at the outfall by crediting the nonpoint discharge phosphorous runoff reductions from agricultural cropland. The practices on agricultural cropland will be modified to reduce the phosphorus discharge from cropland.

The cropland will be modeled with SnapPlus, under the current management system and again with the proposed practices implemented to reduce phosphorus runoff.

Credits generated by the non-point source will be traded by the City to comply with their WPDES Permit.

### B. LOCATION OF THE OUTFALL:

1. **Location of Outfall**: The City of Greenwood discharges from its WWTF outfall to the Black River at approximate latitude 44.76156°, longitude 90.61263°. The discharge point is located in HUC 12, **number 070400070405**

### C. TRADING PARTNERS:

Following are three separate Trading Partners, each with their own different plan.

# C-1 Trading Partner Plan: Robert & Mitch Malm

## C-1 TRADING PARTNER: MITCH MALM FARM

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## C-1 TRADING PARTNER: ROBERT AND MITCH MALM

**A. EXECUTIVE SUMMARY:** Robert and Mitch Malm have a farm located in HUC 12s that discharge into the Black River downstream of the WWTF outfall. The farm consists of a 115 cow Dairy herd and approximately 500 tillable acres. The farm is currently managed with a conservation mindset, practicing conservation tillage, installing grassed waterways, manure storage systems, and managing nutrients through a nutrient management plan. They will be trading Phosphorous credits to the City generated though the Whole Field Management approach with, no till, cover crops, field edge and riparian vegetated filter strips. The PTP generated through Whole Field Management will average approximately 1102 pounds per year from 2018-2023. The proposed trade ratio to be applied will have an Uncertainty factor of 1:1, Equivalency Factor N/A, Downstream Trading Factor of 1.1:1. The proposed minimum trade ratio is 1.2:1 (PTP of 1102± /1.2= 918± lb. of tradeable Phosphorous) see table 4 for year by year credit generation.

**B. LOCATION OF AGRICULTURAL PROPERTY**: The Malm Farm is located in the following HUC 12's: 070400070403, 070400070402, and 070400070401, which discharge into the Black River through Rock Creek. Rock Creek enters the Black River approximately 250' south of the WWTF outfall. The property generating the Phosphorus Credits is located upstream of the City of Greenwood. The fields are located in Section 19, 20, 27, 28, & 29, T27N-R1W, Town of Beaver, Clark County. Attachment A shows the drainage area's HUC 12 map and Attachment B shows an aerial view of the Malm Farm.

**C. EXISTING OPERATION:** The Malm Farm is under the management of Robert and Mitch Malm, and consists of approximately 500 tillable acres. The farm is home to a continuous milking herd of 115 cows plus associated dry cows, young stock and dairy steers. The manure from the dairy herd and steers is applied to the farmland through a nutrient management plan. The primary crop grown is corn both for grain and silage. The remainder of the farm is seeded to alfalfa and soybeans.

**D. SOIL SAMPLING:** Soil sampling is performed in accordance with the farm's nutrient management plan. Soil samples are collected by Northside Elevator Inc. in accordance with UWEX Publication A2100. All soil samples are tested by Dairyland Labs. The entire farm was sampled in the fall of 2016 with the exception of two fields that were added to the farm in 2017; they were sampled in April of 2017. The farm will be sampled again in the fall of 2020 to remain in compliance. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged by Dairyland Labs to create a single recommendation for that field. See Attachment C for results.

**E. CROPLAND:** There are 505± tillable acres on the Malm Farm. In the 2017 crop year: 69 acres were seeded to alfalfa, 38 acres of established alfalfa remained, 181 acres of soybeans, and 217 acres of corn, 73 acres of which were chopped for silage. In the 2016 crop year: 124 acres of established alfalfa remained, 128 acres of soybeans, 38 acres of Cereal Rye, and 216 acres of corn, 89 acres of which were chopped for silage.

F. **SnapPlus - MODELING:** The SnapPlus file used to generate the existing conditions of the Malm Farm was provided by Northside Elevator. Northside Elevator drafts and maintains an approved Nutrient Management Plan for the Malm farm (see Attachment N for 2018, 590 checklist). The SnapPlus farm data provided by Northside Elevator was for 2007-2018.

1. **Previous 2 Years of Cropping History:** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and SnapPlus cropping history was made for 2016 and 2017. SnapPlus cropping history for 2017 and the Cropland Data Layer were in substantial agreement. The SnapPlus cropping history file for 2016 differed from CropScape, for 4 fields: BE, D1, G-1, and G-2. Mitch Malm verified that Cropland Data Layer for those fields likely was correct. The 4 affected fields were adjusted to agree with the Cropland Data Layer for crop type. The nutrient application on those fields was also adjusted. Note in 2016 Malms did not have fields David North and David South.

2. **Current Conditions To Be Projected:** The nutrient applications, cropping and tillage data from the 2018 SnapPlus file, were used for 2018 with the exception of fields that had crop type changes since the nutrient management plan was drafted. The Malm farm is planning to transition to more Alfalfa and add Italian Rye Grass into the rotation. These changes were included in the projection of existing cropping to provide a more conservative estimate of phosphorous credits generated and also in the event that the these changes will not be continued for the term of the plan. The use of Italian Rye Grass as a key forage for dairy farms is a new practice to the area and may or may not be successful. Additionally, Italian Rye Grass is not included as a crop option in the SnapPlus database and no other crop closely matches its growth habits, with rapid early season growth in the seeding year and also regrowth the following year (winter annual), prior to termination. For modeling purposes Sorghum-Sedan grass will be entered in place of Italian Rye Grass in SnapPlus. This selection will be conservative because Italian Rye Grass will overwinter and act as a living cover crop whereas Sorghum-Sedan Grass is a warm season annual. Nutrient used by the 2 crops will be similar, when ryegrass is harvested in the second year prior to termination.

3. **Tillage:** Tillage practices previously entered into SnapPlus will be continued for the projected rotation. It appears that tillage methods were adjusted to meet T for the rotation and do not necessarily follow a pattern. For the projected rotation the general rules were followed: spring cultivation was used for corn following beans, spring chisel plowed without disking was used for soybeans following corn, and fields coming out of or going into alfalfa or Italian Rye Grass were spring chisel plowed and disked.

4. **Rotation:** A standard rotation is not followed on this farm. The rotation for the farm was adjusted on a field by field basis, as needed, due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, and other environmental factors. The theoretical rotation consisted of corn, soybeans, corn, soybeans, alfalfa seeded, and then alfalfa for three years. The projected rotation was laid out by Malm as their 5 year plan, but it will still be subject to adjustments on a field by field basis, as needed, due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, success of Rye Grass, and other environmental factors. The rotation length for the projected plan was set as

2016-2023. This is less than a complete rotation, but meets T, soil test P and PI index for the shortened rotation. Malms are trying to keep field in alfalfa for 5 years instead of 3.

5. **Concentrated Flow Channels:** Concentrated flow channels mapped by North Side elevator in SnapPlus, for fields AN, AS, BE, David North, EF, G-1, and H-1 will remain in place (see Attachment J). Concentrated flow channels existing in fields currently in perennial vegetation will remain in perennial vegetation when the remainder of the field is rotated out of perennial vegetation.

6. **Credit Generation:** The Phosphorous Credits that we will be claiming will be generated through no-till, grassed filter strips and a cover crop after corn silage. Other practices such as an increase in alfalfa or adding Italian Rye Grass will not be claimed. The potentially tradeable phosphorus amounts modeled from the projection rotation agree with the historic phosphorus runoff values of the farm, not including field David North and David South, which were added to the farm in 2017.

7. **Nutrients:** Manure spreading rates and time of year, vary based upon weather conditions and time constraints. Liquid manure is stored in a pit to be spread primarily in the spring and fall, with some summer application. Note there was a change in liquid manure total from 2017-2018. The percent of manure from the dry cows that was collected went from 75% to 100%.

## G. NUTRIENTS FROM MANURE:

1. **Liquid Manure Sources:** The farm, on average, milks 115 cows and has 30 dry cows. For purposes of calculation, all cows will weigh 1400 pounds. Dairy calves are also held in 100% confinement. On average, the farm will house approximately 10 calves up to 150 lbs. and 20 150-250 lbs. The dilution factor of the manure will be assumed at 1.8.

   Using UW Extension guidelines:
   - 1400 lb. Dairy Cow produces 17.7± gal. of manure per day x 1.8 = 32 gal.
   - 1400 lb. Dry Cow produces 13.6± gal. of manure per day x 1.8 = 25 gal.
   - 150 lb. Dairy Calf produces 1.53 ± gal. of manure per day x 1.8 = 2.8.gal.
   - 250 lb. Dairy Calf produces 2.47± gal. of manure per day x 1.8 = 4.5 gal
   - [(365 days x 32 gal x 115) + (365 days x 25 gal. x 30) + (365 days x 2.8 gal. x 10) + (365 days x 4.7 gal. x 20)]. = 1,660,000 gal. liquid manure

   Verification Check: Malms use a custom manure application company, the invoice for spreading from 11-22-17 listed: 40 loads with a 7400 gal. tanker
   49 loads with a 7400 gal tanker
   49 loads with a 5700 gal tanker

   ((40x7400) + (49x7400) + (49x5700)) = 938,000

   The manure pit was last spread in late March of 2017.
   March to the end of November = 8 months / 12 months x 1,660,000 gal.
   Calculated production = 1,107,000 gal.
   This is within 15% of the spread amount.

2. **Solid Manure Sources:** Manure from dairy heifers and steers is collected as solid manure. The farm, on average houses 45 dairy heifers weighing approximately 750 lbs. and 25 dairy heifers weighing approximately 1000 lbs., to be used as replacements in the dairy herd. The farm also retains bull calves to raise as steers. For calculation purposes: 30-750 lb. steers and 50-1000 lb. steers are going to be used. The steers and heifers are located in separate confinements and feed lots. The amount of collected manure is estimated at 80% for steers and 60% for heifers.

   Using UW Extension guidelines, manure production for each animal group is:

   - 750 lb. Dairy Heifer produces 65 lb. of solid manure per day
   - 1000 lb. Dairy Heifer produces 82 lb. of solid manure per day
   - 750 lb. Steer (beef high forage) produces 62 lb. of solid manure per day
   - 1100 lb. Steer (beef high forage) produces 92 lb. of solid manure per day
   - (365 days x 45 x 65 lb. x .6/2000) + (365 days x 25 x 82 lb. x .6/2000) + (365 days x 30 x 62 lb. x .8/2000) + (365 days x 50 x 92 lb. x .8/2000) = 1500 ton.

## H. CROP PRODUCTION:

1. **Corn Production**: The following nutrient application data is the theoretical standard for the Malm farm for corn in the projected rotation. See Attachment C for specific field application data. The yield goal is 151-170 bu. per. acre grain corn and 20-25 ton silage.
   - Commercial starter fertilizer 180 lb. per acre of 15-11-25
   - 28% UAN liquid 5-20 gal. per acre (based upon manure application and 2nd year nitrogen credits)
   - Manure 10,000 gal. per acre 7-6-17; based upon UW standard values @ 6% dry matter.
   - Theoretical total application to the crop 142-80-215 pounds per acre, not including any N credits
   - Theoretical crop removal in grain 140-60-45 pounds per acre (N requirement varies based upon soil and MRTN price ratio)
   - Theoretical crop removal in silage 140-80-185 pounds per acre (N requirement varies based upon soil and MRTN price ratio)

2. **Soybean Production:** The following nutrient application data is the theoretical standard for soybeans in the projected rotation. See Attachment C for specific field application data. The yield goal is 45-55 bu. per. acre
   - 75 lb. DAP 18-46-0 = 14-35-0 pounds per acre
   - 50 lb. Gypsum 0-0-0-17s-22c pounds per acre
   - 175 lb. Potash 0-0-60 = 0-0-105 pounds per acre
   - Theoretical total application to the crop 14-35-105 pounds per acre, not including any N credits
   - Theoretical crop removal in grain NA-40-70 per acre

3. **Sorghum-Sudan (Italian Rye Grass) forage Production:** The following nutrient application data is the theoretical standard for Sorghum-Sudan in the projected rotation. See Attachment C for specific field application data. The yield goal is 5-7 ton. per. acre
   - Spring 25 Ton solid manure 2-3-6 =5 0-75-150 pounds per acre

- Summer 4000 gal Liquid manure 7-6-17 = 28-24-68 pounds per acre
- Theoretical total application to the crop 78-99-218 pounds per acre , not including any N credits
- Theoretical crop removal 100-100-400 pounds per acre

4. **Alfalfa:** The following nutrient application data is the theoretical standard for Alfalfa in the projected rotation. See Attachment C for specific field application data. The yield goal is 4.6 - 5.5 ton per. acre. Alfalfa is the nutrient drawdown crop in the rotation, P-K are under- applied on a yearly basis when fields are in alfalfa.
   - 50 lb. DAP 18-46-0 applied late spring and again late summer = 18-46-0 pounds per acre
   - 50 lb. Gypsum 0-0-0-17s-22c applied late spring and again late summer = 0-0-0-17s22c pounds per acre
   - 200 lb. Potash 0-0-60 applied late spring and again late summer 0-0-120 x 2=0-0-240 pounds per acre
   - Theoretical total application to the crop 18-46-240 pounds per acre, not including any N credits
   - Theoretical crop removal in alfalfa NA-65-300 pounds per acre

**I. POTENTIAL TRADEABLE PHOSPHORUS UNDER CURRENT MANAGEMENT:** SnapPlus Modeling will be used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model 17 fields under projected current management practices. The current management: crops and nutrient applications will be modeled out to 2023 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The following attachments were generated through the modeling process.

Attachment C includes the following SnapPlus reports:

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

**TABLE 1 – Malm Farm Existing Conditions**

| Farm Existing Conditions | Field | Soil Series | Soil Sym. | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Malms Rolling Acres | AN | LOYAL | LoB | 19.5 | 141 | 46 | 125 | 153 | 46 | 117 |
| Malms Rolling Acres | AS | WITHEE | WeA | 16.9 | 61 | 20 | 60 | 62 | 20 | 56 |
| Malms Rolling Acres | BE | LOYAL | LoB | 38.0 | 104 | 283 | 98 | 229 | 85 | 149 |
| Malms Rolling Acres | BW1 | LOYAL | LoB | 25.0 | 54 | 120 | 197 | 56 | 161 | 59 |
| Malms Rolling Acres | BW2 | LOYAL | LoB | 23.0 | 65 | 120 | 182 | 53 | 147 | 177 |
| Malms Rolling Acres | BWN | LOYAL | LoB | 35.0 | 83 | 178 | 175 | 79 | 218 | 82 |
| Malms Rolling Acres | C1 | LOYAL | LoB | 20.6 | 53 | 144 | 66 | 138 | 183 | 53 |
| Malms Rolling Acres | C2 | LOYAL | LoB | 17.0 | 46 | 118 | 47 | 112 | 148 | 42 |
| Malms Rolling Acres | C3 | LOYAL | LoB | 32.0 | 45 | 24 | 131 | 178 | 224 | 230 |
| Malms Rolling Acres | C4 | LOYAL | LoB | 6.0 | 8 | 5 | 28 | 38 | 46 | 48 |
| Malms Rolling Acres | D1 | LOYAL | LoB | 58.4 | 327 | 580 | 401 | 509 | 492 | 80 |
| Malms Rolling Acres | David North | LOYAL | LoB | 16.0 | 93 | 38 | 26 | 16 | 9 | 63 |
| Malms Rolling Acres | David South | LOYAL | LoB | 33.0 | 160 | 63 | 42 | 26 | 14 | 116 |
| Malms Rolling Acres | EF | LOYAL | LoB | 69.2 | 183 | 126 | 79 | 44 | 207 | 392 |
| Malms Rolling Acres | G-1 | LOYAL | LoB | 46.6 | 257 | 288 | 263 | 53 | 29 | 15 |
| Malms Rolling Acres | G-2 | LOYAL | LoB | 7.3 | 42 | 48 | 42 | 9 | 5 | 2 |
| Malms Rolling Acres | H-1 | HILES | HeB | 41.8 | 200 | 62 | 164 | 84 | 102 | 194 |
| **Total** | | | | **505.3** | **1922** | **2263** | **2126** | **1839** | **2136** | **1875** |

**J. CREDIT GENERATION - PROPOSED OPERATING CONDITONS OF THE FARM:**
After the Water Quality Trading Plan has been approved by the DNR and accepted by the City of Greenwood, the farm will install or implement the conservation practices listed in the following section. The City and Malm Farm will enter into an agreement to maintain the conservation practices. The agricultural land will be used to generate Phosphorus Credits through reduction of tillage, installing vegetated buffers, and seeding a cover crop following silage corn.

1. **Nutrient Management.** The farm will continue to be managed through an Approved Nutrient Management Plan. The farm will operate to draw down the phosphorus levels in fields testing at or exceeding 50 ppm Phosphorus. This will be done by withholding nutrient applications and removing crops without replacing the phosphorus. The phosphorus will be drawn down to less than 50 ppm and ultimately to the optimum level on the soil test.

2. **Soil Sampling.** Soil sampling will be conducted on a 4 year schedule to monitor the nutrients and maintain compliance with nutrient management planning. The soil tests will be used to prescribe the proper fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section and the sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to Dairyland labs. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension A2809.

3. **Cropping.** There will be no change to cropping or rotation from the projected rotation of existing conditions.

4. **Tillage:** The farm will transition away from tillage. There may still be a tillage need to incorporate manure under specific conditions. Overall the farm will not be required by nutrient management to incorporate manure (tillage) within the SWQMA areas because no-till will be used to maintain greater than 30% ground cover and permanent vegetative buffers will also be installed in those areas.

   - Corn and Soybeans will be no-tilled into existing crop residue.
   - Alfalfa and Sorghum-Sudan Grass will require tillage to prepare a seed bed because the farm currently does not have a no-till grain drill
   - Cover crops will be seeded either by broadcasting and a vertical tillage pass or a grain drill following vertical tillage. Cover crops will be modeled as no-till because the STIR number for broadcasting seed with vertical tillage would be closer to the STIR of a double disk opener grain drill (no-till) than it would be to the STIR of full tillage.
   - Tillage on the farm will be required to correct ruts and repair locations that may contribute to erosion if they are not repaired.

5. **Cover Crop after Corn Silage:** A cover crop of Cereal Rye will be seeded after Corn silage. A credit will only be generated on the years Cereal Rye is seeded. When harvest is late or soil conditions are too wet, the cover crop will not be seeded, unless sufficient fall growth will be obtained. NRCS Wisconsin Agronomy Technical Note 7 (Attachment D) will be used as the installation and operation manual for cover crops. The following recommendations come from Technical Note 7.
   - Seeding up to October 15 recommended
   - Seeding rate of 0.9 bu. per. acre for incorporated seed
   - Seeding rate of 1.6-2.1 bu. per acre for non-incorporated seed

   If the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop, or an emergency small grain cover crop can be seeded, if the farmer and the City decide to do so. The emergency cover crop will need to be seeded according to Wisconsin Agronomy Technical Note 7 (Attachment D).

6. **Vegetated Filter Strip:** Filter strips reduce suspended solids and also reduce dissolved contaminates in runoff. Filter strips will be located in fields with risk of runoff that have a direct connection to Nelson Creek and Rock Creek. A riparian filter strip will be installed along Nelson Creek. Other filter strips will be installed along waterways that transition into intermittent streams, which carry Phosphorus directly into Rock Creek. Filter strips offer more than a method to trap Phosphorus and other nutrients. They also serve as a removal method; phosphorus trapped in the filter strip will be used by the grass cover and then subsequently removed when the grass is harvested as hay. SnapPlus models flow through a 30' grass filter strip to calculate the reduction of phosphorous leaving the field when the edge of field filter strip option is selected. Filter strips were modeled for fields AN, AS, BE, D1, C3, G-1, and G-2 (see Attachment J for map). See Attachment I for Operation and Maintenance Manual.

A. **Seeding year:**

- **Burn Down.** The filter strip will have an appropriate herbicide such as Glyphosate applied at a rate of 2 Qt. per acre with a surfactant. This will be done to kill all weeds and any existing grasses. Application will be made after the weeds and grasses break dormancy and are actively growing, unless the filter strip is part of an existing grass hay field with a sufficient stem count of cool season grasses.

- **Soil preparation.** A filter strip will not function if a concentrated flow channels pass through the strip, these areas will be graded to create sheet flow. The soil in graded areas will be disked/cultivated to prepare a smooth seedbed.

- **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

| | |
|---|---|
| 30% | Perennial Ryegrass |
| 20% | Fawn Tall Forage Fescue |
| 20% | Timothy |
| 30% | Reed Canary Grass |

- **Nurse Crop.** 1 ½ bushel per acre of oats or equivalent nurse crop will be seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment. Oats are a cool season annual grass that will provide ground cover. Nurse crop will be taken off as oatlage or harvested as grain at maturity.

- **Seed Placement.** Seed will be sown using either a grain drill or by a Brillion type seeder. Upon final seed placement a single pass may be made with a large smooth drum roller.

- **Harvest.** For the purpose of filtering, the filter strips will be harvested as appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

K. **CORRECTIVE MEASURES:** The farm land will be inspected by the County Conservationist to determine if any additional practices will be required to protect against mobilization and delivery of phosphorus.

**L. SCHEDULE OF PROPOSED CONDITIONS GENERATING CREDITS:**

- No-till/tillage reduction 2018 crop year
- Cover crop fall 2018
- Establishment of filter strips fall of 2018-2019

**M. POTENTIALLY TRADEABLE PHOSPHORUS:** As previously stated, this farm is well managed and has already taken steps to reduce runoff. They are proactive in trying/implementing new practices on the farm; not all practices are successful. Which is why the Phosphorous credits that we claim will be generated through No-till/reduced tillage, grassed filter strips and cover crops when applicable, other practices such as an increase in alfalfa, adding Italian Rye Grass will not be included. The following SnapPlus reports will be included in Attachment E

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

**TABLE 2 – PTP No Till/Reduced Tillage**

| Farm no till/reduced tillage | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Malms Rolling Acres | AN | LOYAL | LoB | 19.5 | 112 | 29 | 94 | 93 | 28 | 85 |
| Malms Rolling Acres | AS | WITHEE | WeA | 16.9 | 52 | 14 | 46 | 44 | 13 | 41 |
| Malms Rolling Acres | BE | LOYAL | LoB | 38.0 | 86 | 154 | 82 | 175 | 56 | 124 |
| Malms Rolling Acres | BW1 | LOYAL | LoB | 25.0 | 45 | 104 | 121 | 34 | 55 | 14 |
| Malms Rolling Acres | BW2 | LOYAL | LoB | 23.0 | 55 | 104 | 122 | 35 | 113 | 132 |
| Malms Rolling Acres | BWN | LOYAL | LoB | 35.0 | 70 | 160 | 155 | 45 | 72 | 19 |
| Malms Rolling Acres | C1 | LOYAL | LoB | 20.6 | 45 | 76 | 26 | 88 | 102 | 30 |
| Malms Rolling Acres | C2 | LOYAL | LoB | 17.0 | 40 | 63 | 18 | 72 | 83 | 24 |
| Malms Rolling Acres | C3 | LOYAL | LoB | 32.0 | 45 | 24 | 16 | 40 | 144 | 156 |
| Malms Rolling Acres | C4 | LOYAL | LoB | 6.0 | 8 | 5 | 4 | 9 | 30 | 32 |
| Malms Rolling Acres | D1 | LOYAL | LoB | 58.4 | 327 | 331 | 321 | 200 | 285 | 61 |
| Malms Rolling Acres | David North | LOYAL | LoB | 16.0 | 69 | 37 | 25 | 16 | 9 | 13 |
| Malms Rolling Acres | David South | LOYAL | LoB | 33.0 | 116 | 62 | 42 | 25 | 14 | 23 |
| Malms Rolling Acres | EF | LOYAL | LoB | 69.2 | 183 | 126 | 79 | 44 | 28 | 47 |
| Malms Rolling Acres | G-1 | LOYAL | LoB | 46.6 | 180 | 226 | 188 | 50 | 27 | 14 |
| Malms Rolling Acres | G-2 | LOYAL | LoB | 7.3 | 25 | 32 | 29 | 8 | 4 | 2 |
| Malms Rolling Acres | H-1 | HILES | HeB | 41.8 | 162 | 42 | 59 | 60 | 70 | 105 |
| **Total PTP no till/reduced tillage** | | | | **505.3** | **1620** | **1590** | **1427** | **1038** | **1133** | **921** |
| **Total PTP of Existing Conditions** | | | | | **1922** | **2263** | **2126** | **1839** | **2136** | **1875** |
| **PTP credits from no till/reduced tillage** | | | | | **(302)** | **(673)** | **(698)** | **(801)** | **(1003)** | **(954)** |

## TABLE 3 – PTP No Till/Reduced Tillage & Filter Strips

| Farm no till/reduced tillage & filter strips | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Malms Rolling Acres | AN | LOYAL | LoB | 19.5 | 40 | 9 | 40 | 31 | 8 | 35 |
| Malms Rolling Acres | AS | WITHEE | WeA | 16.9 | 24 | 6 | 25 | 20 | 5 | 21 |
| Malms Rolling Acres | BE | LOYAL | LoB | 38.0 | 27 | 61 | 36 | 59 | 17 | 78 |
| Malms Rolling Acres | BW1 | LOYAL | LoB | 25.0 | 45 | 104 | 121 | 34 | 55 | 14 |
| Malms Rolling Acres | BW2 | LOYAL | LoB | 23.0 | 55 | 104 | 122 | 35 | 113 | 132 |
| Malms Rolling Acres | BWN | LOYAL | LoB | 35.0 | 70 | 160 | 155 | 45 | 72 | 19 |
| Malms Rolling Acres | C1 | LOYAL | LoB | 20.6 | 45 | 76 | 26 | 88 | 102 | 30 |
| Malms Rolling Acres | C2 | LOYAL | LoB | 17.0 | 40 | 63 | 18 | 72 | 83 | 24 |
| Malms Rolling Acres | C3 | LOYAL | LoB | 32.0 | 34 | 18 | 10 | 11 | 56 | 69 |
| Malms Rolling Acres | C4 | LOYAL | LoB | 6.0 | 8 | 5 | 4 | 9 | 30 | 32 |
| Malms Rolling Acres | D1 | LOYAL | LoB | 58.4 | 233 | 122 | 81 | 144 | 113 | 52 |
| Malms Rolling Acres | David North | LOYAL | LoB | 16.0 | 69 | 37 | 25 | 16 | 9 | 13 |
| Malms Rolling Acres | David South | LOYAL | LoB | 33.0 | 116 | 62 | 42 | 25 | 14 | 23 |
| Malms Rolling Acres | EF | LOYAL | LoB | 69.2 | 183 | 126 | 79 | 44 | 28 | 47 |
| Malms Rolling Acres | G-1 | LOYAL | LoB | 46.6 | 41 | 52 | 134 | 44 | 24 | 13 |
| Malms Rolling Acres | G-2 | LOYAL | LoB | 7.3 | 5 | 7 | 21 | 7 | 4 | 2 |
| Malms Rolling Acres | H-1 | HILES | HeB | 41.8 | 162 | 42 | 59 | 60 | 70 | 105 |
| **Total PTP with no till/reduced tillage & filter strips** | | | | **505.3** | **1198** | **1054** | **997** | **744** | **802** | **707** |
| **Total PTP with no till/reduced tillage** | | | | | **1620** | **1590** | **1427** | **1038** | **1133** | **921** |
| **PTP credits generated from filter strips** | | | | | **(422)** | **(536)** | **(430)** | **(294)** | **(331)** | **(214)** |
| **Total PTP existing conditions** | | | | | **1922** | **2263** | **2126** | **1839** | **2136** | **1875** |
| **Total PTP credits from no till/reduced tillage & filter strips** | | | | | **(725)** | **(1209)** | **(1129)** | **(1095)** | **(1334)** | **(1167)** |

## `TABLE 4 – PTP No Till/Reduced Tillage, Filter Strips & Cover Crop

| Farm no till/reduced tillage, filter strips, cover crop | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Malms Rolling Acres | AN | LOYAL | LoB | 19.5 | 40 | 9 | 40 | 31 | 8 | 35 |
| Malms Rolling Acres | AS | WITHEE | WeA | 16.9 | 24 | 6 | 25 | 20 | 5 | 21 |
| Malms Rolling Acres | BE | LOYAL | LoB | 38.0 | 27 | 61 | 36 | 59 | 17 | 78 |
| Malms Rolling Acres | BW1 | LOYAL | LoB | 25.0 | 45 | 104 | 121 | 34 | 55 | 14 |
| Malms Rolling Acres | BW2 | LOYAL | LoB | 23.0 | 55 | 104 | 122 | 35 | 113 | 132 |
| Malms Rolling Acres | BWN | LOYAL | LoB | 35.0 | 70 | 160 | 155 | 45 | 72 | 19 |
| Malms Rolling Acres | C1 | LOYAL | LoB | 20.6 | 45 | 76 | 26 | 88 | 102 | 30 |
| Malms Rolling Acres | C2 | LOYAL | LoB | 17.0 | 40 | 63 | 18 | 72 | 83 | 24 |
| Malms Rolling Acres | C3 | LOYAL | LoB | 32.0 | 34 | 18 | 10 | 9 | 53 | 72 |
| Malms Rolling Acres | C4 | LOYAL | LoB | 6.0 | 8 | 5 | 4 | 6 | 28 | 33 |
| Malms Rolling Acres | D1 | LOYAL | LoB | 58.4 | 233 | 122 | 46 | 138 | 78 | 52 |
| Malms Rolling Acres | David North | LOYAL | LoB | 16.0 | 69 | 37 | 25 | 16 | 9 | 13 |
| Malms Rolling Acres | David South | LOYAL | LoB | 33.0 | 116 | 62 | 42 | 25 | 14 | 23 |
| Malms Rolling Acres | EF | LOYAL | LoB | 69.2 | 183 | 126 | 79 | 44 | 28 | 29 |
| Malms Rolling Acres | G-1 | LOYAL | LoB | 46.6 | 41 | 28 | 117 | 43 | 24 | 13 |
| Malms Rolling Acres | G-2 | LOYAL | LoB | 7.3 | 6 | 4 | 18 | 7 | 4 | 2 |
| Malms Rolling Acres | H-1 | HILES | HeB | 41.8 | 162 | 42 | 59 | 60 | 70 | 105 |
| **Total PTP with no till/reduced tillage, filter strips & cover crop after corn silage** | | | | **505.3** | **1198** | **1026** | **944** | **732** | **764** | **693** |
| **Total PTP with no till/reduced tillage & filter strips** | | | | | **1198** | **1054** | **997** | **744** | **802** | **707** |
| **PTP credit generated from cover crop after corn silage** | | | | | **0** | **(28)** | **(54)** | **(12)** | **(38)** | **(14)** |
| **30% of PTP credit generated from a cover crop planted after corn silage will be claimed** | | | | | **0** | **(8)** | **(16)** | **(3)** | **(11)** | **(4)** |

**Note: Malm farm seeded cereal rye after corn silage on 40% of their silage corn in 2016 and 100% in 2017. They will seed 100% of the corn silage acres to cover crops for the plan which is an increase of 30% from the past two years. Calculation for the credit for (40%+100%)/2-100=30% increase. Meaning 30% of the credit generated by adding the cover crop will be taken because 70% was the average from the two previous years.**

**N. PHOSPHORUS TRADE RATIOS:** The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratios. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices.

1. **Trade Ratio Factors:**

- **Delivery -** N/A
- **Downstream –** 1.1:1 The Malm Farm is located in the following HUC 12's 070400070403, 070400070402, and 070400070401, which discharge into the Black River through Rock Creek. Rock Creek enters the Black River approximately 250' south of the WWTF outfall. See Attachment F
- **Equivalency -** N/A for Phosphorus
- **Uncertainty -** Whole Field Management 1:1 per. Table 16, Pg. 57 of A WQT How To Manual WI DNR, see below eligibly checklist
  - ✓ Approved nutrient management plan
  - ✓ Filter strips/buffer along riparian and high risk
  - ✓ Grassed waterways
  - ✓ Conservation/no-till
  - ✓ Additional practices as deemed by County Conservationist, required site visit
  - ✓ No application of manure on snow covered or frozen ground
  - ✓ All fields under nutrient management plan
  - ✓ Drawdown strategy of nutrients: only one field tests over 50 ppm P, field David North seed into alfalfa to reduce P levels through under fertilizing
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Malm Farm and the City of Greenwood WWTF**.

**O. REPORTING:**

**(REFER TO ATTACHMENT I – OPERATION AND MAINTENANCE PLAN )**

**P. PHOSPHORUS CREDIT GENERATION:** Credits are calculated as the difference between phosphorus lost under current baseline practices and phosphorus lost under the proposed practices. The credits are calculated on an annual basis. The table below shows the trade rates per year beginning in 2018 and extending to 2023.

## TABLE 5: TRADEABLE PHOSPHORUS

| Farm no till/reduced tillage, filter strips, cover crop | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total PTP existing conditions** | | | | **505.3** | **1922** | **2263** | **2126** | **1839** | **2136** | **1875** |
| **Total PTP with no till/reduced tillage & filter strips** | | | | **505.3** | **1198** | **1063** | **1013** | **747** | **814** | **711** |
| **Total PTP with 1.2:1 trade ratio** | | | | **505.3** | **604** | **1000** | **927** | **910** | **1102** | **970** |

**Tradeable phosphorous in years 2024 and beyond will be based upon the 2023 Total Tradeable Phosphorus of 970 pounds per year.**

Q. **MANAGEMENT PRACTICE REGISTRATION:** Submit the following to the DNR to register that the management practices have been installed (2018):

- Date of contract
- Management Practice Registration form Attachment F
- Date corrective measures have been completed
- Date of seeding filter strips
- Date of 90% ground cover and photo verification
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season
- Date of cover crop seeding
- Photo of cover crop growth both fall and spring
- Verification that no till and reduced till were performed where each is applicable

1. **Monthly Reporting:** Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**

2. **Annual Reporting**: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:

- Verification that site inspection has occurred
- Brief summary of site inspection findings
- Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
- At least 1 photo of the filter strips vegetative cover, indicating condition

- A summary of credits used each month over the calendar year
- Date of cover crop seeding
- Photo of cover crop growth both spring and fall
- Verification that no till and reduced till were performed where each is applicable

3. **Notification of Problems That Affect Credit Generation:** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT plan. The City will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

- In the event that a cover crop is unable to be seeded after corn silage, the credit will not be claimed
- In the event that the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop
- In the event that a field requires tillage as a corrective action that is not consistent with the tillage outlined for that crop, the credit for that no till/tillage reduction for that field will not be taken

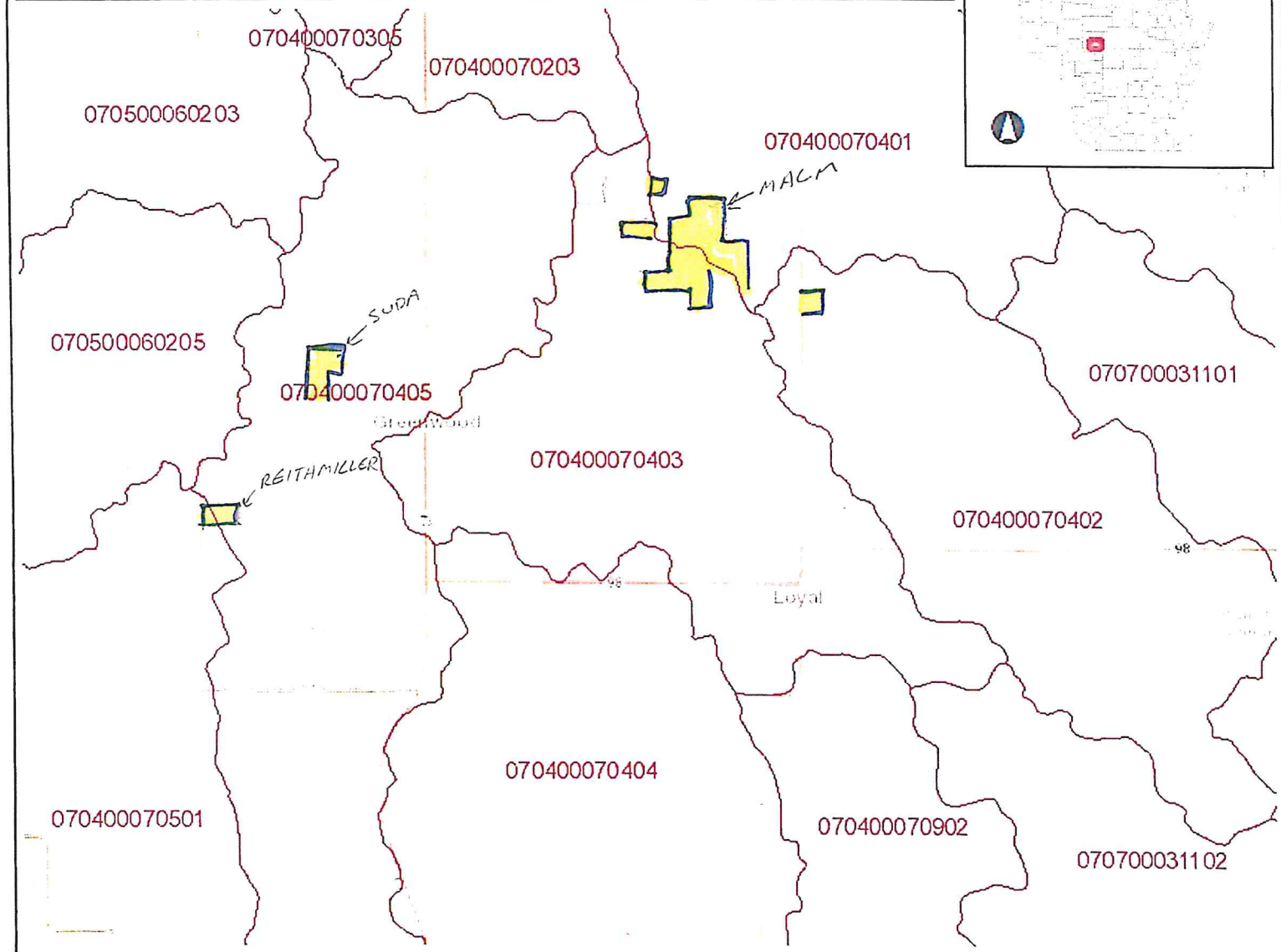
**R. DNR RIGHT OF ENTRY:** The Malm farm grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

**S. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST**
This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 8, page 37 of Guidance for Implementing Water Quality Trading Plans, Guidance No: 3800-2013-04; Form 3400-208 is included as Attachment J. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit". Below are listed the checklist questions, **bold and underlined**, with the answers following.

| | |
|---|---|
| • **Permittee's/credit user's WPDES permit number**: | No. WI 020249-09 |
| • **Permittee's/credit users contact information:** | Lonna Klinke, City Clerk<br>102 N. Main Street<br>Greenwood WI 54437<br>Phone 715-267-6205 |
| • **Pollutant for which credit will be generated:** | Phosphorus |
| • **Amount of Credits available from each location, management practice, local government unit when acting as broker:** | See Table 5, page 14 |
| • **Certification that the content of the trading application is accurate and correct.** | See Attachment L |
| • **Signature and date of signature of permittee's/ credit users authorized representative:** | See Attachment L |

| | |
|---|---|
| • **Location where credits will be generated:** | See Attachment A and B |
| • **Identification of methods including management practices that will be used to generate credits:** | See Section J, page 6-8 |
| • **Duration of agreement with each credit generator:** | 5 years with the provision of extension, unless WPDES removes the phosphorous requirement |
| • **Schedule for installation/construction of each management practice:** | See Section L |
| • **Operation and Maintenance plan for each management practice,** | Section J-6 See Attachment I<br>Section J-5 See Attachment D |
| • **Date when credits become available for each management practice:** | See Section J-4,J-5, & J-6, page 7-8 |
| • **Models used to derive the amount of credits:** | SnapPlus, see Attachment C & E |
| • **The applicable trade ratio for each management practice including supporting technical basis:** | See section N, page 12 |

# Surface Water Data Viewer Map




**Legend**

- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

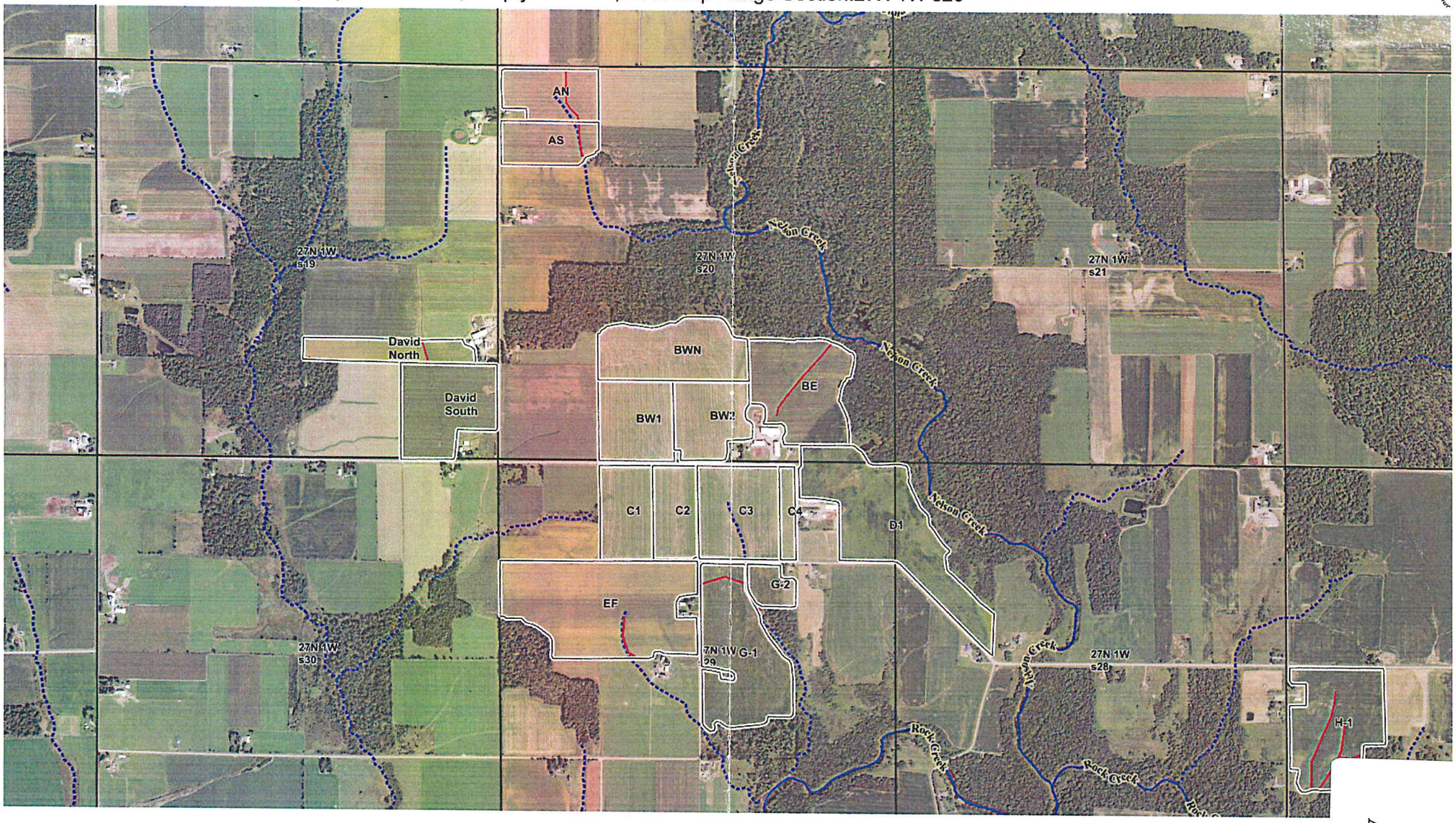
1: 126,720

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

**Notes**

MALM
ATTACHMENT A

lap Generated on:6/19/2018 SnapMap Version: 17 , Crop year: 2017, Township Range Section:27N 1W s20




MALM
ATTACHMENT B

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

**Farm** has 17 fields totalling 505.3 acres
**Farm Narrative:** General Farm Notes:
Malm's Rolling Acres has 505 acres under tillage and primarily has corn, soybeans and alfalfa planted. Currently there are 115 milking cows, 30 dry cows, 70 heifers, and 30 calves. Additionally there are also aproximately 80 beef cattle on the farm.

Manure Storage/Spreading:
The Malm's have pit storage on the farm and haul manure in the spring and the fall of each year. There is also some solid manure and it is also hauled in the spring and fall. Solid manure may be stacked in the summer and winter when it is prohibitive to haul. Please see the spreading plan report for specific fields and rates of all manure applications.

Crops:
The Malm's currently have a eight year crop rotation that is subject to adjustments on a field by field basis as needed due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, and other environmental factors. The rotation consists corn, soybeans, corn, soybeans, alfalfa seeded, and then alfalfa for three years.
Generally we will assume the following yield goals:
Corn (30" rows) Grain -- 150 bu./acre
Corn (30" rows) Silage -- 20 tons/acre
Soybeans -- 50 bu./acre
Alfalfa -- 5 ton/acre

Management Concerns:
All of the fields meet 'T' for tollerable soil loss and all fields have a 'PI' below 6.
There is one field with a soil test P above 50 ppm.
Three fields partially lie within a SWQMA. Fields BE, D1, and E all lie within 1000 feet of a pond or 300 feet of a stream. All manure withing these areas is incorporated within 72 hours of spreading.
Fields Be, BW2, D1, Ef, G-1 have winter spreading restricions with parts of the field have a slope 9% or greater.
There are no fields with restrictive soil types.

Summary:
Sampling is up to date. New sampling will be completed in the fall of 2016. This nutrient management plan will be updated annually according to the 590 standard. Field David north and David south have been added to the farm in 2017 sampling will be complete in the spring of 2017 to remain in compliance.

**Annual Farm Notes:**

No Annual Farm Notes

MALM
ATTACHMENT C

**Spreader Calibration Methods:** Custom applications

## Narrative and Crops:

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 |
| AS | 16.9 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 |
| BE | 38 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Cultivation<br>46-55 | Alfalfa/Grass<br>Seeding Spring<br>Spring Cultivation<br>2.6-3.5 |
| BW1 | 25 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 |
| BW2 | 23 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, no disk<br>151-170 | Soybeans 7-10 inch row<br>Spring Cultivation<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 |
| BWN | 35 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 |
| C1 | 20.6 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 |

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| C2 | 17 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn grain<br>Spring Chisel, disked<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 |
| C3 | 32 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage<br>Spring Chisel, disked<br>20.1-25 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage<br>Spring Chisel, disked<br>20.1-25 |
| C4 | 6 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage<br>Spring Chisel, disked<br>20.1-25 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage<br>Spring Chisel, disked<br>20.1-25 |
| D1 | 58.4 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage<br>Spring Chisel, disked<br>20.1-25 | Soybeans 7-10 inch row<br>Spring Cultivation<br>46-55 | Corn silage<br>Spring Cultivation<br>20.1-25 | Alfalfa Seeding Spring<br>Spring Chisel, disked<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |
| David North | 16 | Alfalfa Seeding Spring<br>Spring Chisel, disked<br>2.6-3.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn grain<br>Spring Chisel, disked<br>151-170 |
| David South | 33 | Alfalfa Seeding Spring<br>Spring Chisel, disked<br>1.0-2.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn grain<br>Spring Chisel, disked<br>151-170 |
| EF | 69.2 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage<br>Spring Chisel, disked<br>20.1-25 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 |
| G-1 | 46.6 | Corn silage<br>Spring Cultivation<br>15.1-20 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Alfalfa/Grass Seeding Spring<br>Spring Chisel, disked<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| G-2 | 7.3 | Corn silage<br>Spring Cultivation<br>15.1-20 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Alfalfa/Grass Seeding Spring<br>Spring Chisel, disked<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |
| H-1 | 41.8 | Corn grain<br>Spring Cultivation<br>151-170 | Soybeans 7-10 inch row<br>Spring Chisel, no disk<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Soybeans 7-10 inch row<br>Spring Chisel, disked<br>46-55 | Corn grain<br>Spring Cultivation<br>151-170 |

**Summary by Crop:**

**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

| Crops Grouped By Category | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Corn grain | Acres | 78<br>12,519 | 76<br>12,198 | 125<br>20,063 | 74<br>11,877 | 98<br>15,729 | 114<br>18,297 |
| Sorghum-sudan forage | Acres | 58<br>348 | 83<br>498 | 74<br>444 | 79<br>474 | 61<br>366 | 36<br>216 |
| Soybeans 7-10 inch row | Acres | 159<br>8,030 | 132<br>6,666 | 96<br>4,848 | 121<br>6,111 | 116<br>5,858 | 167<br>8,434 |
| Alfalfa/Grass Seeding Spring | Acres | | | 54<br>95 | | | 38<br>116 |
| Alfalfa | Acres | 107<br>540 | 156<br>788 | 118<br>596 | 118<br>596 | 49<br>247 | |
| Corn silage | Acres | 54<br>948 | 58<br>1,308 | 38<br>857 | 58<br>1,308 | 69<br>1,556 | 38<br>857 |
| Alfalfa Seeding Spring | Acres | 49<br>149 | | | | 58<br>102 | |
| Alfalfa/Brome | Acres | | | | 54<br>273 | 54<br>273 | 112<br>566 |

# FM6: Soil Test Report

| | |
|---|---|
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| AN | | 19.5 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 4 | 4 | 6.9 | 3.6 | 10 | 39 | 0 | 12 |
| AS | | 16.9 | WeA | WITHEE | 2016-11-03 | Dairyland Labs | 8S4050 | 3 | 4 | 6.8 | 3.2 | 11 | 41 | 0 | 11 |
| BE | | 38 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 8 | 8 | 6.8 | 3.5 | 26 | 113 | 0 | 11 |
| BW1 | | 25 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 5 | 5 | 6.9 | 3.8 | 20 | 67 | 7.5 | 12 |
| BW2 | | 23 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 5 | 5 | 6.8 | 4.0 | 25 | 70 | 0 | 14 |
| BWN | | 35 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 7 | 7 | 6.7 | 3.2 | 17 | 42 | 0 | 10 |
| C1 | | 20.6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 4 | 5 | 6.6 | 4.3 | 21 | 62 | 0 | 14 |
| C2 | | 17 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 3 | 3 | 6.8 | 4.1 | 24 | 81 | 0 | 13 |
| C3 | | 32 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 6 | 7 | 6.5 | 3.8 | 20 | 66 | 0 | 13 |
| C4 | | 6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 1 | 2 | 6.6 | 4.1 | 28 | 76 | 0 | 13 |
| D1 | | 58.4 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 12 | 12 | 6.9 | 3.1 | 14 | 48 | 0 | 11 |
| David North | | 16 | LoB | LOYAL | 2017-04-20 | Dairyland Labs | 8S8697 | 3 | 4 | 7.2 | 3.4 | 72 | 112 | 0 | 14 |
| David South | | 33 | LoB | LOYAL | 2017-04-20 | Dairyland Labs | 8S8697 | 7 | 7 | 6.5 | 3.2 | 39 | 119 | 0 | 11 |

*SnapPlus Soil Test Report*

09/06/2018

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| EF | | 69.2 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | **14** | **14** | 6.6 | 3.3 | 13 | 50 | 0 | 10 |
| G-1 | | 46.6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | **9** | **8** | 6.3 | 3.2 | 14 | 40 | 0 | 11 |
| G-2 | | 7.3 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | **1** | **2** | 6.4 | 3.8 | 13 | 37 | 0 | 12 |
| H-1 | | 41.8 | HeB | HILES | 2016-11-03 | Dairyland Labs | 8S4050 | **8** | **9** | 6.3 | 2.8 | 12 | 50 | 0 | 8 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| AN | 2016-11-03 | | | | | | X | | |
| AS | 2016-11-03 | | | | | | X | | |
| BE | 2016-10-11 | | | | | | X | | |
| BW1 | 2016-10-11 | | | | | | X | | |
| BW2 | 2016-10-11 | | | | | | X | | |
| BWN | 2016-11-03 | | | | | | X | | |
| C1 | 2016-10-11 | | | | | | X | | |
| C2 | 2016-10-11 | | | | | | X | | |
| C3 | 2016-10-11 | | | | | | X | | |
| C4 | 2016-10-11 | | | | | | X | | |
| D1 | 2016-11-03 | | | | | | X | | |
| David North | 2017-04-20 | | | | | | X | | |
| David South | 2017-04-20 | | | | | | X | | |
| EF | 2016-11-03 | | | | | | X | | |
| G-1 | 2016-10-11 | | | | | | X | | |
| G-2 | 2016-10-11 | | | | | | X | | |
| H-1 | 2016-11-03 | | | | | | X | | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Liquid | Production (Gallons) | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 |
| | Used (Gallons) | 1,601,000 | 1,655,400 | 1,669,800 | 1,655,000 | 1,665,500 | 1,659,660 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 |
| | Dry Matter (%) | 6 | 6 | 6 | 6 | 6 | 6 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Solid | Production (Tons) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Used (Tons) | 1,500 | 1,494 | 1,498 | 1,500 | 1,500 | 1,500 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Application Results Reported For Farm All

**Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.**

| | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 24,420 | 24,420 | 24,420 | 24,420 | 24,420 | 24,420 |
| | P2O5 | 14,460 | 14,460 | 14,460 | 14,460 | 14,460 | 14,460 |
| | K2O | 37,220 | 37,220 | 37,220 | 37,220 | 37,220 | 37,220 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 23,712 | 24,347 | 24,532 | 24,360 | 24,486 | 24,416 |
| | P2O5 | 14,106 | 14,414 | 14,513 | 14,430 | 14,493 | 14,458 |
| | K2O | 36,217 | 37,106 | 37,375 | 37,135 | 37,314 | 37,214 |
| Total Fertilizer Nutrients Applied (lb) | N | 13,367 | 13,077 | 13,861 | 12,033 | 12,163 | 11,016 |
| | P2O5 | 11,376 | 12,235 | 10,446 | 11,749 | 11,239 | 10,302 |
| | K2O | 47,771 | 57,389 | 50,625 | 59,985 | 58,419 | 46,311 |
| Total Crop Removal (lb) | P2O5 | 28,229 | 32,115 | 30,095 | 32,309 | 29,679 | 28,636 |
| | K2O | 81,966 | 100,193 | 87,270 | 102,836 | 84,290 | 77,461 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | -2,746 | -5,466 | -5,136 | -6,130 | -3,947 | -3,876 |
| | K2O | 2,022 | -5,699 | 731 | -5,716 | 11,443 | 6,064 |

# NM4: Manure Tracking Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

| Acres/ CropYear | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|
| Acres in plan | 505.3 | 505.3 | 505.3 | 505.3 | 505.3 | 505.3 |
| Acres receiving manure | 174.6 | 217.0 | 291.1 | 212.2 | 227.8 | 257.4 |

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Liquid | Production (Gallons) | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 |
| | Used (Gallons) | 1,601,000 | 1,655,400 | 1,669,800 | 1,655,000 | 1,665,500 | 1,659,660 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 |
| | Dry Matter (%) | 6 | 6 | 6 | 6 | 6 | 6 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Solid | Production (Tons) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Used (Tons) | 1,500 | 1,494 | 1,498 | 1,500 | 1,500 | 1,500 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Estimated Livestock Manure Production For 2018

| Animal Type | Subfarm | Barn | # of Animals | Total No. Of Days | % Collected As Solid | % Collected As Liquid | Yearly Tons | Yearly Gallons |
|---|---|---|---|---|---|---|---|---|
| Beef High Forage 1100 lbs | | | 50 | 365 | 80 | 0 | 672 | 0 |
| Beef High Forage 750 lbs | | | 30 | 365 | 80 | 0 | 272 | 0 |
| Dairy Calf 150 lbs | | | 10 | 365 | 0 | 100 | 0 | 10,220 |
| Dairy Calf 250 lbs | | | 20 | 365 | 0 | 100 | 0 | 32,850 |
| Dairy Heifer 1000 lbs | | | 25 | 365 | 60 | 0 | 224 | 0 |
| Dairy Heifer 750 lbs | | | 45 | 365 | 60 | 0 | 320 | 0 |
| Dairy Lactating Cows 1400 lbs | | | 115 | 365 | 0 | 100 | 0 | 1,343,200 |
| Dairy Dry Cows 1400 lbs | | | 30 | 365 | 0 | 100 | 0 | 273,750 |
| | | | | | | **Farm Totals** | 1,488 | 1,660,020 |

## Manure Storage For 2018

**No Storages Found**

## Spreaders For 2018

**No Spreaders Found**

# NM3: Field Data and 590 Assessment Plan

| Reported For | Malms Rolling Acres |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2017-01-30 |
| SnapPlus Version 17.1 built on 2018-05-25 | |
| M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | | | | 19.5 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Cg-Sg7-SGf-Cg-Sg7-SGf | SFC-SCND-SFC-SCD-SCND-SFC | 2018-2023 | 4 | 3 | 0.3 | 5 | 10 | 18 | - |
| AS | | | | 16.9 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Cg-Sg7-SGf-Cg-Sg7-SGf | SFC-SCND-SFC-SCD-SCND-SFC | 2018-2023 | 4 | 3 | 0.3 | 4 | 11 | 18 | - |
| BE | | | | 38 | Clark | LOYAL LsC | 7 | 180 | 2.1 - 6 | 0 - 300 | S % | No / No | No | No | Sg7-Cg-SGf-Cg-Sg7-AGs | SCND-SFC-SFC-SFC-SFC-SFC | 2018-2023 | 5 | 4.6 | 0.2 | 6 | 26 | -111 | - |
| BW1 | | | | 25 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg7-SGf-Cg-Sg7-Cg-Sg7 | SCND-SFC-SCD-SCND-SFC-SCND | 2018-2023 | 4 | 3 | 0.2 | 4 | 20 | 6 | - |
| BW2 | | | | 23 | Clark | LOYAL LoB | 4 | 295 | 2.1 - 6 | 1001 - 5000 | % | No / No | No | No | Sg7-SGf-Cg-Sg7-SGf-Cg | SCND-SFC-SCND-SFC-SFC-SCD | 2018-2023 | 4 | 3.4 | 0.4 | 6 | 25 | -24 | - |

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BWN | | | | 35 | Clark | LOYAL LoB | 4 | 200 | 2.1 - 6 | 1001 - 5000 | | No / No | No | No | Sg7-SGf-Cg-Sg7-Cg-Sg7 | SCND-SFC-SCD-SCND-SFC-SCND | 2018-2023 | 4 | 3.3 | 0.2 | 4 | 17 | 9 | - |
| C1 | | | | 20.6 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg7-Cg-Sg7-SGf-Cg-Sg7 | SCND-SFC-SCND-SFC-SCD-SCND | 2018-2023 | 4 | 3.3 | 0.2 | 5 | 21 | -28 | - |
| C2 | | | | 17 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg7-Cg-Sg7-SGf-Cg-Sg7 | SCND-SFC-SCND-SFC-SCD-SCND | 2018-2023 | 4 | 3.3 | 0.2 | 5 | 24 | -28 | - |
| C3 | | | | 32 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | A-A-Csl-Sg7-SGf-Csl | None-None-SCD-SCND-SFC-SCD | 2018-2023 | 4 | 3.1 | 0.2 | 5 | 20 | -104 | - |
| C4 | | | | 6 | Clark | LOYAL LoB | 3 | 295 | 2.1 - 6 | 1001 - 5000 | | No / No | No | No | A-A-Csl-Sg7-SGf-Csl | None-None-SCD-SCND-SFC-SCD | 2018-2023 | 4 | 3.2 | 0.1 | 5 | 28 | -119 | - |
| D1 | | | | 58.4 | Clark | HILES HeB | 4 | 295 | 2.1 - 6 | 0 - 300 | W S % | No / No | No | No | SGf-Csl-Sg7-Csl-As-AB | SFC-SCD-SFC-SFC-SCD-None | 2018-2023 | 3 | 2.9 | 0.4 | 5 | 14 | 55 | - |
| David North | | | | 16 | Clark | LOYAL LoB | 4 | 200 | 0 - 2 | 1001 - 5000 | | No / No | No | No | As-A-A-A-A-Cg | SCD-None-None-None-None-SCD | 2018-2023 | 4 | 1.4 | 0.5 | 2 | 72 | -280 | 0 |
| David South | | | | 33 | Clark | LOYAL LoB | 4 | 200 | 0 - 2 | 1001 - 5000 | | No / No | No | No | As-A-A-A-A-Cg | SCD-None-None-None-None-SCD | 2018-2023 | 4 | 1.4 | 0.5 | 2 | 39 | -265 | - |

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | | | | 69.2 | Clark | LOYAL LoB | 4 | 295 | 0 - 2 | 301 - 1000 | S % | No / No | No | No | A-A-A-A-Csl-Sg7 | None-None-None-None-SCD-SCND | 2018-2023 | **4** | **2.2** | **0.4** | **3** | 13 | -84 | - |
| G-1 | | | | 46.6 | Clark | LOYAL LsC | 7 | 200 | 2.1 - 6 | 1001 - 5000 | % | No / No | No | No | Csl-Sg7-AGs-AB-AB-AB | SFC-SCND-SCD-None-None-None | 2018-2023 | **5** | **2.7** | **0.5** | **3** | 14 | -76 | - |
| G-2 | | | | 7.3 | Clark | LOYAL LoB | 4 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Csl-Sg7-AGs-AB-AB-AB | SFC-SCND-SCD-None-None-None | 2018-2023 | **4** | **1.7** | **0.6** | **2** | 13 | -76 | - |
| H-1 | | | | 41.8 | Clark | HILES HeB | 4 | 250 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Cg-Sg7-Cg-SGf-Sg7-Cg | SFC-SCND-SFC-SFC-SCD-SFC | 2018-2023 | **3** | **2.4** | **0.4** | **3** | 12 | 32 | - |

**Crop Abbreviations**

| Abbreviation | Crop |
|---|---|
| A | Alfalfa |
| AB | Alfalfa/Brome |
| AGs | Alfalfa/Grass Seeding Spring |
| As | Alfalfa Seeding Spring |
| Cg | Corn grain |
| Csl | Corn silage |
| Sg7 | Soybeans 7-10 inch row |

**Tillage Abbreviations**

| Abbreviation | Tillage |
|---|---|
| None | None |
| SCD | Spring Chisel, disked |
| SCND | Spring Chisel, no disk |
| SFC | Spring Cultivation |

| | |
|---|---|
| SGf | Sorghum-sudan forage |

**Restriction Legend**

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Corn grain<br>Spring Cultivation | 105-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 54-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Summer Unincorp | 195 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 3,900 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 12000 gal | Fall Unincorp | 234,000 gal |
| AS | 16.9 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Corn grain<br>Spring Cultivation | 140-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 19-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Spring Unincorp | 169 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 3,380 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 12000 gal | Spring Unincorp | 202,800 gal |
| BE | 38 | Corn silage to small grain cover crop<br>Fall Cultivation, cover crop no till | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-0-34 | 0 | 20 | 14-35-105 | 34-35-105 | 34-35-71 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Spring Incorp | 2,850 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Incorp | 1,900 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Spring Incorp | 6,650 lb |

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain Fall Chisel, no disk | Soybeans 7-10 inch row Spring Chisel, no disk | 0-40-53 | 0 | 14 | 14-35-105 | 28-35-105 | 28-0-52 | 0-5-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Corn grain Spring Chisel, no disk | Soybeans 7-10 inch row Spring Chisel, no disk | 0-0-23 | 0 | 14 | 14-35-105 | 28-35-105 | 28-35-82 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Unincorp | 1,725 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,150 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 4,025 lb |
| BWN | 35 | Corn silage to small grain cover crop Fall Chisel, no disk , cover crop no till | Soybeans 7-10 inch row Spring Chisel, no disk | 0-40-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-5-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Corn grain Spring Chisel, disked | Soybeans 7-10 inch row Spring Chisel, no disk | 0-0-53 | 0 | 15 | 14-35-105 | 29-35-105 | 29-35-52 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,545 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,030 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 3,605 lb |
| C2 | 17 | Corn grain Fall Chisel, no disk | Soybeans 7-10 inch row Spring Chisel, no disk | 0-0-23 | 0 | 14 | 14-35-105 | 28-35-105 | 28-35-82 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,275 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 14 | 28-24-158 | 42-24-158 | 42-0-0 | 0-41-197 | Borate 0-0-0 | 10 lb | Spring Unincorp | 320 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,600 lb |

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 14 | 28-24-158 | 42-24-158 | 42-0-0 | 0-41-197 | Potash 0-0-60 | 150 lb | Spring Unincorp | 4,800 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Fall Unincorp | 128,000 gal |
| C4 | 6 | Alfalfa None | Alfalfa None | 0-33-355 | 0 | 14 | 11-9-116 | 25-9-116 | 25-0-0 | 0-24-239 | Borate 0-0-0 | 10 lb | Spring Unincorp | 60 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 300 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 900 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 1500 gal | Fall Unincorp | 9,000 gal |
| D1 | 58.4 | Corn grain Fall Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-120-284 | 0 | 10 | 114-131-307 | 124-131-307 | 24-11-23 | 0-0-0 | Liquid 7-6-17 | 5000 gal | Summer Unincorp | 292,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 233,600 gal |
| | | | | | | | | | | | Solid 2-3-6 | 25.7 ton | Fall Unincorp | 1,500 ton |
| David North | 16 | Soybeans 7-10 inch row Spring Chisel, disked | Alfalfa Seeding Spring Spring Chisel, disked | 0-0-95 | 20 | 10 | 0-0-105 | 30-0-105 | 30-0-10 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,800 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| David South | 33 | Soybeans 7-10 inch row Spring Chisel, no disk | Alfalfa Seeding Spring Spring Chisel, disked | 0-0-20 | 20 | 10 | 0-0-105 | 30-0-105 | 30-0-85 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 5,775 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| EF | 69.2 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |

## *SnapPlus Producer's Plan Report*



| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Soybeans 7-10 inch row Fall Cultivation | Corn silage Spring Cultivation | 140-95-159 | 0 | 5 | 101-20-45 | 106-20-45 | 0-0-0 | 34-75-114 | 28% UAN (Liquid 28-0-0) 28-0-0 | 25 gal | Summer Unincorp | 1,165 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 9,320 lb |
| G-2 | 7.3 | Soybeans 7-10 inch row No Till | Corn silage Spring Cultivation | 140-95-195 | 0 | 0 | 101-20-45 | 101-20-45 | 0-0-0 | 39-75-150 | 28% UAN (Liquid 28-0-0) 28-0-0 | 25 gal | Summer Unincorp | 182 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 1,460 lb |
| H-1 | 41.8 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 130-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 29-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 418 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 12000 gal | Fall Unincorp | 501,600 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,462 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 975 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 3,412 lb |
| AS | 16.9 | Corn grain Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,268 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 845 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,958 lb |
| BE | 38 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 140-0-0 | 0 | 0 | 142-80-215 | 142-80-215 | 2-80-215 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Spring Unincorp | 570 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 380,000 gal |
| BW1 | 25 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-90-353 | 20 | 0 | 63-77-173 | 83-77-173 | 0-0-0 | 17-13-180 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 95,000 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 450 ton |

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | | | | | | | | | | | legume | | 20-0-0 | |
| BW2 | 23 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-2-308 | 20 | 0 | 63-77-173 | 83-77-173 | 0-75-0 | 17-0-135 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 87,400 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 414 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BWN | 35 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-90-405 | 20 | 0 | 63-77-173 | 83-77-173 | 0-0-0 | 17-13-232 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 133,000 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 630 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C1 | 20.6 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 140-0-38 | 0 | 0 | 156-80-215 | 156-80-215 | 16-80-177 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 412 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,120 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 206,000 gal |
| C2 | 17 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 140-0-0 | 0 | 0 | 156-80-215 | 156-80-215 | 16-80-215 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 340 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,400 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 170,000 gal |
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 9 | 18-46-240 | 27-46-240 | 27-0-0 | 0-19-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 320 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 1,600 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 1,600 lb |

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 9 | 18-46-240 | 27-46-240 | 27-0-0 | 0-19-115 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,600 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,400 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,400 lb |
| C4 | 6 | Alfalfa None | Alfalfa None | 0-35-355 | 0 | 4 | 18-46-240 | 22-46-240 | 22-11-0 | 0-0-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 60 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 300 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 300 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 300 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 300 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,200 lb |
| D1 | 58.4 | Sorghum-sudan forage Spring Cultivation | Corn silage Spring Chisel, disked | 190-99-217 | 0 | 42 | 127-80-215 | 169-80-215 | 0-0-0 | 21-19-2 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 584 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 11,680 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Fall Unincorp | 584,000 gal |
| David North | 16 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-0-290 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-50 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |

## SnapPlus Producer's Plan Report

09/06/2018

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| David North | 16 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-0-290 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-50 | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-0-215 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-25 | 0-0-0 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Corn silage Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,495 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 8,155 lb |
| G-2 | 7.3 | Corn silage Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 548 lb |

## SnapPlus Producer's Plan Report

09/06/2018

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-2 | 7.3 | Corn silage Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 1,278 lb |
| H-1 | 41.8 | Corn grain Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,135 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,090 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 7,315 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Sorghum-sudan forage<br>Spring Cultivation | 100-120-132 | 20 | 0 | 98-84-238 | 118-84-238 | 18-0-106 | 0-36-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 195,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 78,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| AS | 16.9 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Sorghum-sudan forage<br>Spring Cultivation | 100-120-132 | 20 | 0 | 98-84-238 | 118-84-238 | 18-0-106 | 0-36-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 169,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 67,600 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BE | 38 | Corn grain<br>Spring Cultivation | Sorghum-sudan forage<br>Spring Cultivation | 100-0-119 | 0 | 23 | 73-24-68 | 96-24-68 | 0-24-0 | 4-0-51 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 570 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Spring Unincorp | 152,000 gal |
| BW1 | 25 | Sorghum-sudan forage<br>Spring Cultivation | Corn grain<br>Spring Chisel, disked | 190-60-90 | 0 | 23 | 127-80-215 | 150-80-215 | 0-20-125 | 40-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 250 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 5,000 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 250,000 gal |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW2 | 23 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, no disk | 190-0-75 | 0 | 23 | 127-80-215 | 150-80-215 | 0-80-140 | 40-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 230 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 230,000 gal |
| BWN | 35 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, disked | 190-60-90 | 0 | 23 | 112-80-165 | 135-80-165 | 0-20-75 | 55-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Fall Unincorp | 525 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,000 lb |
| | | | | | | | | | | | Solid 2-3-6 | 20 ton | Spring Unincorp | 700 ton |
| C1 | 20.6 | Corn grain Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-0-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-35-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Fall Unincorp | 1,545 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,030 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Fall Unincorp | 3,605 lb |
| C2 | 17 | Corn grain Spring Cultivation | Soybeans 7-10 inch row Spring Chisel, no disk | 0-0-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-35-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,275 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Alfalfa None | Corn silage Spring Chisel, disked | 190-80-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-0-0 | 45-36-127 | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 6,400 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Spring Unincorp | 128,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| C4 | 6 | Alfalfa None | Corn silage Spring Chisel, disked | 165-29-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-15-0 | 20-0-127 | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 1,200 lb |

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 6 | Alfalfa None | Corn silage Spring Chisel, disked | 165-29-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-15-0 | 20-0-127 | Liquid 7-6-17 | 4000 gal | Spring Unincorp | 24,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| D1 | 58.4 | Corn silage Spring Chisel, disked | Soybeans 7-10 inch row Spring Cultivation | 0-70-115 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Unincorp | 4,380 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 10,220 lb |
| David North | 16 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa None | Alfalfa None | 0-0-275 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-35 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |

## SnapPlus Producer's Plan Report

09/06/2018

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Soybeans 7-10 inch row Spring Chisel, no disk | Alfalfa/Grass Seeding Spring Spring Chisel, disked | 0-55-160 | 20 | 0 | 35-56-179 | 55-56-179 | 55-1-19 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 25 lb | Fall Unincorp | 1,165 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 6,990 lb |
| | | | | | | | | | | | Solid 2-3-6 | 14.8 ton | Spring Unincorp | 690 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| G-2 | 7.3 | Soybeans 7-10 inch row Spring Chisel, no disk | Alfalfa/Grass Seeding Spring Spring Chisel, disked | 0-55-160 | 20 | 0 | 35-56-179 | 55-56-179 | 55-1-19 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 25 lb | Fall Unincorp | 182 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 1,095 lb |
| | | | | | | | | | | | Solid 2-3-6 | 14.8 ton | Spring Unincorp | 108 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| H-1 | 41.8 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 130-90-0 | 0 | 0 | 135-74-198 | 135-74-198 | 5-0-198 | 0-16-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 627 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 9000 gal | Spring Unincorp | 376,200 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, disked | 190-90-0 | 0 | 33 | 127-80-215 | 160-80-215 | 0-0-215 | 30-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 195 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,510 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 195,000 gal |
| AS | 16.9 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, disked | 190-90-0 | 0 | 33 | 127-80-215 | 160-80-215 | 0-0-215 | 30-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Spring Unincorp | 169 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,380 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 169,000 gal |
| BE | 38 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Cultivation | 190-0-45 | 0 | 9 | 127-80-215 | 136-80-215 | 0-80-170 | 54-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Spring Unincorp | 380 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 380,000 gal |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain Spring Chisel, disked | Soybeans 7-10 inch row Spring Chisel, no disk | 0-20-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-15-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Corn grain Spring Chisel, no disk | Soybeans 7-10 inch row Spring Cultivation | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,150 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 4,025 lb |
| BWN | 35 | Corn grain Spring Chisel, disked | Soybeans 7-10 inch row Spring Chisel, no disk | 0-20-40 | 0 | 16 | 14-35-105 | 30-35-105 | 30-15-65 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-0-238 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-0 | 0-0-34 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 164,800 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 82,400 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C2 | 17 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-0-163 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-41 | 0-0-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 136,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 68,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C3 | 32 | Corn silage Spring Chisel, disked | Soybeans 7-10 inch row Spring Chisel, no disk | 0-40-115 | 0 | 9 | 14-35-105 | 23-35-105 | 23-0-0 | 0-5-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,400 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 5,600 lb |

## SnapPlus Producer's Plan Report

09/06/2018

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 6 | Corn silage<br>Spring Chisel, disked | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-5-115 | 0 | 9 | 14-35-105 | 23-35-105 | 23-30-0 | 0-0-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 450 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 300 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 1,050 lb |
| D1 | 58.4 | Soybeans 7-10 inch row<br>Spring Cultivation | Corn silage<br>Spring Cultivation | 140-110-240 | 0 | 0 | 123-97-199 | 123-97-199 | 0-0-0 | 17-13-41 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 876 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 11,680 lb |
| | | | | | | | | | | | Solid 2-3-6 | 25.7 ton | Spring Unincorp | 1,500 ton |
| David North | 16 | Alfalfa<br>None | Alfalfa<br>None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa<br>None | Alfalfa<br>None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa<br>None | Alfalfa<br>None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Alfalfa/Grass Seeding Spring Spring Chisel, disked | Alfalfa/Brome None | 0-94-336 | 0 | 12 | 18-46-240 | 30-46-240 | 30-0-0 | 0-48-96 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Grass Seeding Spring Spring Chisel, disked | Alfalfa/Brome None | 0-94-336 | 0 | 12 | 18-46-240 | 30-46-240 | 30-0-0 | 0-48-96 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H-1 | 41.8 | Corn grain<br>Spring Cultivation | Sorghum-sudan forage<br>Spring Cultivation | 100-120-24 | 0 | 21 | 77-66-187 | 98-66-187 | 0-0-163 | 2-54-0 | Liquid 7-6-17 | 7000 gal | Spring Unincorp | 292,600 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 167,200 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain<br>Spring Chisel, disked | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-70-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,462 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 975 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 3,412 lb |
| AS | 16.9 | Corn grain<br>Spring Chisel, disked | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-70-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,268 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 845 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,958 lb |
| BE | 38 | Corn grain<br>Spring Cultivation | Soybeans 7-10 inch row<br>Spring Cultivation | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,900 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,650 lb |
| BW1 | 25 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Corn grain<br>Spring Cultivation | 140-45-0 | 0 | 0 | 120-74-198 | 120-74-198 | 0-29-198 | 20-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 250 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 5,000 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 9000 gal | Spring Unincorp | 225,000 gal |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW2 | 23 | Soybeans 7-10 inch row Spring Cultivation | Sorghum-sudan forage Spring Cultivation | 100-0-245 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-0 | 0-0-41 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 184,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 92,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BWN | 35 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain Spring Cultivation | 140-45-25 | 0 | 0 | 139-77-207 | 139-77-207 | 0-32-182 | 1-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Fall Unincorp | 525 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,000 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 9500 gal | Spring Unincorp | 332,500 gal |
| C1 | 20.6 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, disked | 190-0-90 | 0 | 28 | 156-80-215 | 184-80-215 | 0-80-125 | 6-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 412 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,120 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 206,000 gal |
| C2 | 17 | Sorghum-sudan forage Spring Cultivation | Corn grain Spring Chisel, disked | 190-0-34 | 0 | 28 | 156-80-215 | 184-80-215 | 0-80-181 | 6-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 340 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,400 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 170,000 gal |
| C3 | 32 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-90-405 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-0 | 0-18-201 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 256,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 128,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C4 | 6 | Soybeans 7-10 inch row Spring Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-15-405 | 20 | 0 | 84-72-204 | 104-72-204 | 4-57-0 | 0-0-201 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 48,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 24,000 gal |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | | | | | | | | | | | legume | | 20-0-0 | |
| D1 | 58.4 | Corn silage<br>Spring Cultivation | Alfalfa Seeding<br>Spring<br>Spring Chisel, disked | 0-55-160 | 0 | 21 | 18-46-240 | 39-46-240 | 39-0-80 | 0-9-0 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 11,680 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 11,680 lb |
| David North | 16 | Alfalfa<br>None | Alfalfa<br>None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa<br>None | Alfalfa<br>None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Corn silage Spring Chisel, disked | 190-110-240 | 90 | 0 | 92-85-175 | 182-85-175 | 0-0-0 | 8-25-65 | 28% UAN (Liquid 28-0-0) 28-0-0 | 0 gal | Spring Unincorp | |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 13,840 lb |
| | | | | | | | | | | | Solid 3-3-6 | 21.7 ton | Spring Incorp | 1,500 ton |
| | | | | | | | | | | | legume | | 90-0-0 | |
| G-1 | 46.6 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H-1 | 41.8 | Sorghum-sudan forage<br>Spring Cultivation | Soybeans 7-10 inch row<br>Spring Chisel, disked | 0-70-0 | 0 | 26 | 14-35-105 | 40-35-105 | 40-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,135 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,090 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 7,315 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Sorghum-sudan forage<br>Spring Cultivation | 100-120-184 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-20 | 0-48-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 156,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 78,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| AS | 16.9 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Sorghum-sudan forage<br>Spring Cultivation | 100-120-184 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-20 | 0-48-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 135,200 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 67,600 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BE | 38 | Soybeans 7-10 inch row<br>Spring Cultivation | Alfalfa/Grass Seeding Spring<br>Spring Cultivation | 0-0-0 | 20 | 0 | 0-0-60 | 20-0-60 | 20-0-60 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,900 lb |
| | | | | | | | | | | | Potash 0-0-60 | 100 lb | Spring Unincorp | 3,800 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BW1 | 25 | Corn grain<br>Spring Cultivation | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-11-0 | 0 | 21 | 14-35-105 | 35-35-105 | 35-24-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain<br>Spring Cultivation | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-11-0 | 0 | 21 | 14-35-105 | 35-35-105 | 35-24-105 | 0-0-0 | Potash<br>0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Sorghum-sudan forage<br>Spring Cultivation | Corn grain<br>Spring Chisel, disked | 190-0-75 | 0 | 28 | 120-92-188 | 148-92-188 | 0-92-113 | 42-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 15 gal | Summer Unincorp | 345 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 4,600 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 0 gal | Spring Unincorp | |
| | | | | | | | | | | | Solid<br>2-3-6 | 23.9 ton | Fall Unincorp | 550 ton |
| BWN | 35 | Corn grain<br>Spring Cultivation | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-8-0 | 0 | 22 | 14-35-105 | 36-35-105 | 36-27-105 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Corn grain<br>Spring Chisel, disked | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 0 lb | Fall Unincorp | |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Unincorp | 1,030 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Fall Unincorp | 3,605 lb |
| C2 | 17 | Corn grain<br>Spring Chisel, disked | Soybeans 7-10 inch row<br>Spring Chisel, no disk | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage<br>Spring Chisel, disked | 190-80-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-15-0 | 55-0-45 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Summer Unincorp | 320 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 6,400 lb |

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage<br>Spring Chisel, disked | 190-80-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-15-0 | 55-0-45 | Solid<br>2-3-6 | 25 ton | Spring<br>Unincorp | 800 ton |
| C4 | 6 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage<br>Spring Chisel, disked | 190-0-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-95-0 | 55-0-45 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Fall<br>Unincorp | 60 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring<br>Subsurface | 1,200 lb |
| | | | | | | | | | | | Solid<br>2-3-6 | 25 ton | Spring<br>Unincorp | 150 ton |
| D1 | 58.4 | Alfalfa Seeding Spring<br>Spring Chisel, disked | Alfalfa/Brome<br>None | 0-95-275 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-35 | Diammonium phosphate (DAP)<br>18-46-0 | 50 lb | Summer<br>Unincorp | 2,920 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP)<br>18-46-0 | 50 lb | Summer<br>Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring<br>Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Summer<br>Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Spring<br>Unincorp | 11,680 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Summer<br>Unincorp | 11,680 lb |
| David North | 16 | Alfalfa<br>None | Corn grain<br>Spring Chisel, disked | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 0 gal | Summer<br>Unincorp | |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring<br>Subsurface | 3,200 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 10000 gal | Spring<br>Unincorp | 160,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| David South | 33 | Alfalfa<br>None | Corn grain<br>Spring Chisel, disked | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 0 gal | Fall<br>Unincorp | |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring<br>Subsurface | 6,600 lb |

## SnapPlus Producer's Plan Report

09/06/2018

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| David South | 33 | Alfalfa None | Corn grain Spring Chisel, disked | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 330,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| EF | 69.2 | Corn silage Spring Chisel, disked | Soybeans 7-10 inch row Spring Chisel, no disk | 0-70-115 | 0 | 22 | 32-27-77 | 54-27-77 | 54-0-0 | 0-43-38 | Diammonium phosphate (DAP) 18-46-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Gypsum 0-0-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Potash 0-0-60 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Liquid 7-6-17 | 4550 gal | Spring Unincorp | 314,860 gal |
| G-1 | 46.6 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-2 | 7.3 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |
| H-1 | 41.8 | Soybeans 7-10 inch row Spring Chisel, disked | Corn grain Spring Cultivation | 130-90-0 | 0 | 0 | 142-80-215 | 142-80-215 | 12-0-215 | 0-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 627 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 418,000 gal |

# WQ1: P Trade Report

| Reported For | Malms Rolling Acres |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2017-01-30 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - tillage master .snapDb

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| AN | LOYAL | LoB | 20 | 141 | 46 | 125 | 153 | 46 | 117 |
| AS | WITHEE | WeA | 17 | 61 | 20 | 60 | 62 | 20 | 56 |
| BE | LOYAL | LoB | 38 | 104 | 283 | 98 | 229 | 85 | 149 |
| BW1 | LOYAL | LoB | 25 | 54 | 120 | 197 | 56 | 161 | 59 |
| BW2 | LOYAL | LoB | 23 | 65 | 120 | 182 | 53 | 147 | 177 |
| BWN | LOYAL | LoB | 35 | 83 | 178 | 175 | 79 | 218 | 82 |
| C1 | LOYAL | LoB | 21 | 53 | 144 | 66 | 138 | 183 | 53 |

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| C2 | LOYAL | LoB | 17 | 46 | 118 | 47 | 112 | 148 | 42 |
| C3 | LOYAL | LoB | 32 | 45 | 24 | 131 | 178 | 224 | 230 |
| C4 | LOYAL | LoB | 6 | 8 | 5 | 28 | 38 | 46 | 48 |
| D1 | LOYAL | LoB | 58 | 327 | 580 | 401 | 509 | 492 | 80 |
| David North | LOYAL | LoB | 16 | 93 | 38 | 26 | 16 | 9 | 63 |
| David South | LOYAL | LoB | 33 | 160 | 63 | 42 | 26 | 14 | 116 |
| EF | LOYAL | LoB | 69 | 183 | 126 | 79 | 44 | 207 | 392 |
| G-1 | LOYAL | LoB | 47 | 257 | 288 | 263 | 53 | 29 | 15 |
| G-2 | LOYAL | LoB | 7 | 42 | 48 | 42 | 9 | 5 | 2 |
| H-1 | HILES | HeB | 42 | 200 | 62 | 164 | 84 | 102 | 194 |
| **Total** | | | **505** | **1,922** | **2,263** | **2,126** | **1,839** | **2,136** | **1,875** |

United States Department of Agriculture

# Wisconsin Agronomy Technical Note 7

## *Cover and Green Manure Crops Benefits to Soil Quality*

### Measuring the Benefits of the Cover Crop Practice

One of the goals of conservation planning is to consider the effects of conservation practices and systems on soil quality. A number of assessments tools exist to measure the impact of the Cover Crop practice.

### Assessing Cover Crop Value as it relates to Soil Quality Benefits

1. The Revised Universal Soil Loss Equation (RUSLE2) and Wind Erosion Prediction System (WEPS) planning software is used to evaluate the impact of cover crop management decisions have on soil loss levels. In addition, RUSLE2 has the Soil Condition Index (SCI) that determines a relative value for anticipated Organic Matter based on management of the cover crop.
2. A soil health assessment is used to determine existing soil characteristics. Typical soil health assessments include soil organic matter levels, soil respiration rates, soil bulk density, soil penetrometer readings, soil infiltration rates and observation of soil cohesion utilizing the slake test.
3. Observable reduction in soil erosion (sheet, rill, ephemeral, and gully). Cover crops increase vegetative and residue cover during periods when erosion energy is high. The addition of cover crops to low residue cropping systems such as corn silage and vegetables can substantially decrease soil erosion.
4. Observable soil porosity improvements due to an increase of biomass, that when decomposed, increases soil organic matter content promoting increased microbial activity and aggregation of soil particles. As a result, soil porosity is increased and bulk density is decreased. **Caution**: avoid planting cover crops when soils are saturated to avoid compaction, or use alternative establishment methods such as aerial over seeding.
5. Observable soil aggregate stability which results in less soil crusting. Cover crops reduce soil crusting by protecting the soil surface from the direct impact of rain drops. The resulting increase of soil organic matter, improved infiltration, and increased aggregate stability will further reduce soil crusting and improve the uniformity of seed germination.
6. Adequate soil surface cover and the improved aggregate stability will reduce erosion and surface water run-off and increase water infiltration rates. Channels created by cover crop roots and earthworms form macropores that further improve infiltration. Cover crops, especially small grains, can effectively capture and utilize excess nitrogen to prevent infiltration below the crop root zone.
7. Cover crops reduce the volume of surface runoff resulting in reduced nutrient losses. Decomposition of cover crop or green manure biomass provides a slow release of nutrients to the root zone. Legume crops fix atmospheric nitrogen and provide nitrogen for the main crop. Legumes also capture more phosphorus than grass or small grains. Small grains are useful as catch crops to utilize end of season nitrogen, which reduces the potential for nitrogen leaching. Planting cover crops on continuous corn silage fields with a history of repeated manure applications during late summer is highly beneficial.
8. Nutrient Immobilization can be observed when decomposition releases available nitrogen to the next crop.

   The carbon-to-nitrogen (C:N) ratio is a relative estimate of the nitrogen necessary to decompose an organic matter (crop residue) source. A C:N ratio of 50:1 or higher will temporarily "immobilize" soil nitrogen. The immobilization is a result of microbes consuming readily available soil nitrogen during the decomposition of crop residue. The nitrogen will remain immobilized until the microbes deplete the crop residue or other organic matter sources.

   Young cereal rye plants have a 14:1 C:N ratio as compared to corn stalks with a 60:1 C:N ratio. The C:N ratio for most clover plants is generally 15:1, which allows nitrogen to quickly become available to the following crop.
9. Cover crops can reduce pesticide loss by reducing surface water runoff resulting in reduced pesticide losses. Increased organic matter increases soil biological activity that can increase the breakdown of pesticide residues.

10. Visible reduction in weed pressure is due to reduced light, seed/soil contact and soil temperatures. The release of chemical compounds by the cover crop (allelopathy) may also inhibit weed growth.

    The potential for a negative impact on the primary crop can be reduced by killing the cover crop two to three weeks prior to planting and ensuring good seed/soil contact during seed placement.

11. Soil moisture can be improved when cover crops and green manure crops remove excess moisture from wet soils, resulting in reduction of "waterlogging" in poorly drained soils.

## Specie Selection and Seed Quality

- Select species that are adapted to soil, climatic, and ecological site conditions.
- Select species suited for the planned purpose and specific site conditions.
- Do not plant species identified as restricted or prohibited by law.
- Inoculate legumes with the proper Rhizobium bacteria.
- Non-commercial seed can be used, as long as the seed has been tested for germination.
- Seeding rates are based on certified obtained from commercial sources.

## Seedbed Preparation and Seeding

Site preparation shall be adequate to assure weed suppression and to promote germination and growth of the species planted. Seedbed preparation and seeding methods are determined as a result of the following:

- Resource concern and/or objective for planting the cover crop
- Cover crop life cycle (overwintering)
- Current soil surface conditions, moisture levels, existing biomass (surface cover)
- Planned harvest date of the primary crop
- Estimated growing degrees units remaining prior to the average killing frost
- Availability of labor/time and equipment

### Seeding Methods

Wisconsin NRCS Conservation Practice Standard 340 - Cover Crop, supports several seeding and planting options to establish cover crops. Successful cover crop plantings require seeding within the recommended dates, seeding methods that ensure adequate seed to soil contact and sufficient soil moisture to support seedling growth.

Cover crops may be drilled, no-tilled, slurry applied, broadcast inter-seeded, over-seeded or frost seeded with or without incorporation depending on field conditions. Incorporation of seed following planting by light shallow tillage, or use of a ring roller, culti-packer or similar tool to embed the seed will result in a more uniform seedling emergence. The following non-traditional establishment methods can be used to expand the settings where cover crops can be utilized.

***Slurry Seeded Cover Crops*** - Slurry-enriched seeding is a process that combines low-disturbance tillage, manure application and the seeding of cover crops into one operation. This technique is efficient and effective in un-tilled crop fields. Cover crop seed is mixed directly with liquid manure in the manure tanker. Cover crop species best suited to plant with this system include; cereal rye, wheat, annual ryegrass, oil seed radish, red, ladino and crimson clover.

For additional details on slurry seeding refer to the following link: http://www.mccc.msu.edu/SlurrySeeding.html.

***Frost Seeding*** is categorized as broadcast or aerial seeding occurring mid to late March through early April during the active freezing and thawing cycle. Warm daytime temperatures combined with low overnight temperatures cause the surface of the soil to freeze and crack. Frost seeding takes skill in determining the exact conditions that are favorable and in assuring the crop will not freeze after emergence.

**Guidelines when frost seeding cover crops:**

1. Seedbed conditions must favor good seed to soil contact: a) un-tilled winter wheat or soybean residue fields are ideal seedbed conditions, b) frost seeding SHALL NOT occur on un-disturbed heavy residue corn fields or similar conditions, c) when seedbed preparation is necessary to prepare a uniform seedbed in the fall prior to freeze-up and maintain 30-70% residue surface cover.
2. Frost seeding SHALL NOT occur on areas covered with solid ice or snow cover depth greater than 2 inches.
3. Frost seeding shall be completed before the end of the freeze and thaw cycle. Note: Ideal frost seeding conditions vary from year to year, and in certain years the window for seeding may amount to a few days.

**CAUTION**: Because the risk for failure is high, this practice requires a variance from the Area Resource Conservationist or State Agronomist except for the red clover inter-seeded into dormant winter wheat.

Refer to UW-Publication— "Frost Seeding Red Clover in Winter Wheat" for additional details: http://ipcm.wisc.edu/downloads/nutrient-managment/

***Broadcast inter-seeding or over-seeding*** without incorporation may be used to establish a cover crop into a fully mature crop scheduled for harvest in the near future. The terms inter-seeding and over-seeding, are used interchangeably defining seeding techniques where the cover crop is seeded over the top of an un-harvested crop without incorporation into the soil.

When broadcasting cover crops, seed germination depends on the presence of adequate moisture at the soil surface or within the crop residue layer. Dry conditions will result in poor germination due to limited seed to soil contact. The following guidelines will reduce the risk of seeding failure, when cover crops are broadcasted.

**Guidelines for broadcasting cover crops:**

1. Assess site for one or more of the following conditions: a) moist, friable soil surface, b) 30% soil surface residue cover to conserve surface moisture for seed germination and c) high probability of rainfall after seeding.
2. Seeding as early as possible within the recommended seeding dates will improve stand density and vigor.
3. Select species known to have the highest germination rate may favor broadcast methods. Below are specie groupings in numeric order beginning with the highest probabilities of successfully germinating:
   - Group 1: small grains
   - Group 2: annual/perennial rye grass
   - Group 3: small seed brassicas
   - Group 4: small seed legumes

**Note**: Large legume seed crops are not recommended for aerial seeding.

**Additional guidelines when broadcasting cover crops into standing crops:**

1. Corn for grain: Do not over-seed cover crops when corn is immature or green. Cover crops should be over-seeded after the corn has begun to dry down, silks are brown and leaves are dried up to the ear and turned down. This timing will minimize the potential for seed to be trapped in leaf whorls and will allow sunlight to reach the ground between the rows.
2. Corn for silage: Cover crops should not be over-seeded into corn that will be harvested as silage, more than 21 days prior to the planned harvest date.
3. Soybeans: Over-seed cover crops into standing un-harvested soybeans when 50% of the leaves are yellow and/or prior to 50% leaf drop.
4. Red clover into winter wheat: Over-seed red clover into dormant winter wheat by frost seeding during the active freeze and thaw cycle (late February to mid-March).
5. Red clover into snap beans: Over-seed red clover during the last cultivation of snap beans.

**Fertilization**

Cover crops usually follow heavily fertilized crops and do not require fertilization. Fall-planted fibrous rooted grasses or small grains will scavenge leftover nitrogen from the previous crop. Legume cover crops will add nitrogen to the system for the following crop. For these reasons, fertilizer is not required unless the site condition warrants it.

**Seed Mixtures for Cover Crops**

The seeding mixture used will depend on the objective and identified resource concern. Cover crops can include a diverse mix of grass, non-legume broadleaf and legume plants. The seed mixture should create a balanced stand of above ground biomass and root structure to enhance soil building. Seed mixtures that develop a full canopy will maximize snow retention, soil surface coverage, reduce soil erosion and may be utilized for livestock forage. A mixture of grasses, non-legume broadleaf (brassicas, buckwheat, etc.) and legume plants will improve the soil's biological activity. A mixture of plant species will feed beneficial organisms, improve soil structure, reduce compaction, improve water infiltration/water holding capacity and increase the amount of available nutrient exchange sites in the soil.

Cover crop mixtures are often recommended when the goal is to address multiple objectives and resource concerns. When considering multiple species mixtures, consider the effects of; species growth characteristics, anticipated growing conditions, nutrient needs, planned seeding rate and the termination method and date. For multiple specie mixtures, refer to Table 4 "Recommended Cover Crop Mixtures for Planting in Wisconsin".

Use the following references to evaluate cover crop species for growth characteristics and conservation benefits: Table 2 "Identification and Comparison of Cover Crop Performance and Benefits by Species".

Table 3 "Morphology, Physiology and Growth Requirements". "Midwest Cover Crop Decision Tool" http://mccc.msu.edu/index.htm.

## Single and Multiple Species Seeding Rate Calculation

When designing cover crop seed mixtures, the seeding rate recommendation is based on the seeding method selected. Cover crops that are drilled, no-tilled, or broadcast and incorporated, the minimum recommended seeding rate or higher can be planned. Cover crop seeding methods such as broadcast over-seeding or inter-seeding, slurry seeded, frost seeded and other methods, where seed to soil contact is of concern, a higher recommended seeding rate is required. When designing multiple cover crop seed mixtures, multiply the minimum seeding rate for each selected plant species by the planned percentage of each species. The "planned percentage" represents a general proportion of the seed to be planted per species and is not a direct calculation of seeds per square foot or an estimate of canopy cover or plant dominance of a given species. Refer to Table 1 "Cover Crop Species Recommended for Planting in Wisconsin" for the recommended seeding rate per species, and Table 4 "Recommended Cover Crop Mixtures for Planting in Wisconsin".

A waiver from the State Agronomist or Area Resource Conservationist for NRCS is required when:

1. Less than **one pound** of seed per plant species is required when designing seed mixtures.
2. More than 4 species are included in the seed mixtures.
3. Cover crops are planted later than the recommended ending seeding date.

### Calculating Seeding Rates and Mixes:

Minimum Table 1 seeding rate range or higher per species multiplied by the planned percentage of each species will determine the pounds of seed per plant species to be planted per acre.

***Round up to the next full pound of seed if the seeding rate calculation results in a decimal of 0.5 or larger.***

### Example Seeding Mixture Calculation Results

Spring Mix—Cover crop will be drilled into soybean stubble. The landowner selected the seed mixture below:

40% oats…minimum seeding rate 30 lbs./ac. (Table 1)

40% oilseed radish 4 lbs./ac. (Table 1)

20% field pea 65 lbs./ac. (Table 1)

Actual seeding rates:

Oats= 30 lbs X 40% = 12 lbs for the mix per acre

Radish=4 lbs X 40%= 1.6 which rounded up is 2 lbs for the mix per acre

Pea=65 lbs X 20%=13 lbs for the mix per acre

## Cover Crop Attributes

The following summary of cover crop attributes provides additional information (advantages and disadvantages) regarding the species listed in Table 1. Refer to Table 2 for performance and roles of cover crops.

***Alfalfa (Medicago sativa)***

- Advantages: nitrogen fixer, crude protein: 14-22%, forms arbuscular mycorrhizal associations, attracts pollinators, good at scavenging nitrogen from the soil, and break up compaction.
- Disadvantages: produces autotoxcity and will not tolerate wet sites.

***Annual Ryegrass (Lolium multiflorum)***

- Advantages: quick-growing non-spreading bunchgrass, establishes quickly even in gravelly or wet soils, excellent for trapping nitrogen, dense shallow root system improves water infiltration and enhances tilth, improves early season weed control, attracts few insect pests and generally can help reduce insect pest level, can be over-seeded into corn or soybeans after leaves turn yellow, self-pollinating, and forms arbuscular mycorrhizal associations.
- Disadvantages: can host high densities of Penetrans Root-Lesion Nematode.

***Barley, Spring/Winter (Hordeum vulgare)***

- Advantages: produces a deep fibrous root system, produces more biomass than any other small grain crop, will scavenge significant amounts of nitrogen, releases allelopathic chemicals that help suppress weeds, drastically reduces root-knot nematode populations, has a higher nutritional value than oats or wheat, works well in cocktail mixtures, prefers mesic soil conditions.
- Disadvantages: fusarium head blight can be a problem when other small grains are planted within one year and disease problems (especially with tan spot) can be problematic, avoid planting barley after winter wheat.

***Berseem Clover (Trifolium alexandrinum)***

- Advantages: extremely vigorous tall annual white clover, tolerant of wet conditions, crude protein: 27-29%, excellent nitrogen fixer, forms arbuscular mycorrhizal associations, flowers attract bees, excellent weed suppressor.
- Disadvantages: none.

*Buckwheat (Fagopyrum esculentum)*

» Advantages: provides quick soil cover, excellent weed suppressor, provides nectar for pollinators and other beneficial insects, loosens topsoil, rejuvenates low fertility soils, dense fibrous root cluster in the top 10 inches of soil providing an extensive root surface area for nutrient uptake, extracts soil phosphorus from the soil better than most grain-type cover crops, residue decomposes quickly releasing nutrients to the next crop, excellent choice to follow early vegetables, popular honey bee pollinator.

» Disadvantages: sets seed quickly, will reseed and may become a weed if flowers mature, frost sensitive, will not germinate/thrive in cold soils, and highly attractive to Japanese Beetles.

*Canola/Rape (Brassica napus)*

» Advantages: flowers attract pollinators, good at scavenging nitrogen from the soil, crude protein: hay 16%, grain 21%, silage 12%, pasture 17%.

» Disadvantages: susceptible to sclerotinia, host for Penetrans Root-Lesion Nematode.

*Cereal Rye, Winter (Secale cereale)*

» Advantages: tremendous biomass production, can be seeded later in the fall than other cover crops, germinate at temperatures as low as 34°F and produce vegetative growth at 38°F, reduces nitrate leaching, excellent weed suppressor, secrete compounds that will inhibit germination of weeds such as lambquarters, redroot pigweed, dandelions, and Canada thistle, few diseases affect rye as compared to other small grains, can be over-seeded in field crops, can be grown on a wide range of soils and will increase the concentration of exchangeable K near the surface by means of its fibrous root system, tolerates triazines herbicides, excellent for scavenging nitrogen, medium water use.

» Disadvantages: may become a weed when terminated too late, not recommended before corn in rotation, host for Penetrans Root-Lesion Nematode.

*Chicory (Cichorium intybus)*

» Advantages: rapid growth, excellent forage crop, crude protein: 20-32%, attracts pollinators, rooting depth 4 to 5 feet, forms arbuscular mycorrhizal associations, used in mixtures, grows well under droughty conditions.

» Disadvantages: none.

*Cow pea (Vigna unguiculata)*

» Advantages: provides 50 to 100 pounds of nitrogen, attracts pollinators, forms arbuscular mycorrhizal associations.

» Disadvantages: none.

*Crimson Clover (Trifolium incarnatum)*

» Advantages: grows well on poorly drained soils, use as a winter kill annual, utilize as hay, pasture, favored legume of organic farmers, attracts pollinators, grows well in extreme heat.

» Disadvantages: host for root knot nematode and Penetrans Root-Lesion Nematode.

*Field Pea (Pisum satuvum)*

» Advantages: residue breaks down and releases nitrogen quickly, provide nitrogen at a rate of 50 to 100 pounds per acre, mix well with oats and barley, excellent for soil building and water use is low.

» Disadvantages: can lead to aphanomyces problems when in rotations with alfalfa, susceptible to sclerotinia.

*Forage/Oilseed Radish (Raphanus sativa)*

» Advantages: deep root crop, excellent for compaction control, crude protein: 26-30%, good for scavenging nitrogen from the soil, flowers attract pollinators and excellent for grazing.

» Disadvantages: winter kills at 25°F, odor during decay, host for root knot nematode, Penetrans Root-Lesion Nematode, and sugarbeet cyst nematode.

*Forage Turnips (Brassica rapa)*

» Advantages: root crop, crude protein: leaf tops 16%, root 12-14%, forms arbuscular mycorrhizal associations, rated good for scavenging Nitrogen, flowers attract pollinators, excellent for grazing.

» Disadvantages: can become a serious weed if allowed to go to seed, host for root knot nematode, Penetrans Root-Lesion Nematode, and sugarbeet cyst nematode.

*Hairy Vetch (Vicia villosa)*

» Advantages: provides 60 to 120 pounds of nitrogen, attracts pollinators, used in a cocktail mixtures, only vetch species that can

be fall seeded and reach maturity the next year, can withstand trampling from grazing animals during May and June, adapted to a wide range of soil types, but prefers loamy and sandy soils.

» Disadvantages: stems are weak and have a tendency to lodge, when seeded with a small grain, the weak stems are supported by the tangling of the tendrils with the small grain stalks, do not plant hairy vetch with a winter grain if you desire to harvest grain for feed or sale, fall seeded hairy vetch will winterkill with temperatures less than 15 degrees with no snow cover, certain species of nematodes increase with hairy vetch, Spring/summer seeding is less successful.

***Japanese Millet (Echinochloa frumentacea)***

» Advantages: fast growing annual grass, tolerates frequent clipping, makes excellent forage and hay, tolerate both droughty and wet soils, excellent feed source, good choice for converting land to vegetable production.

» Disadvantages: will not germinate/thrive in cold soil, host for Penetrans Root-Lesion Nematode.

***Oats (Avena sativa)***

» Advantages: provide quick weed suppressing biomass, naturally occurring compounds in roots and residue can hinder weed growth, excellent nutrient catch crop, improves productivity of legumes when planted in mixes, inexpensive to establish.

» Disadvantages: slow to release nitrogen to following crops, unless growth is terminated in mid-vegetative stage (12 to 18 inches), host for Penetrans Root- Lesion Nematode.

***Pearl Millet (Pennisetum glaucum)***

» Advantages: forms arbuscular mycorrihizal associations, excellent for grazing, low water use requirements, self-pollinator.

» Disadvantages: slower to establish than sorghum or sudangrass, will not germinate/ thrive in cold soil.

***Red Clover (Trifolium pratense)***

» Advantages: provides 70 to 120 pounds of nitrogen, crude protein: 15%, flowers attract bees and can be used in cocktail mixtures.

» Disadvantages: host for root knot nematode and Penetrans Root-Lesion Nematode.

***Sunflower (Helianthus annuus)***

» Advantages: deep rooted, effective in mining mobile nutrients deep in the soil profile, attracts pollinators, forms arbuscular mycorrhizal associations, can be used cocktail mixtures.

» Disadvantages: may increase sclerotinia inoculum.

***Sorghum-Sudangrass Hybrids (Sorghum bicolor x S. bicolor var. Sudanese)***

» Advantages: tall fast-growing heat-loving summer annual, suppress some nematodes species, seedling, shoots, leaves and roots secrete allelopathic compounds that suppress weeds, has an aggressive root system that relieves compaction, mowing stalks increases root mass 5 to 8 times compared with un-mowed stalks and forces the roots to penetrate deeper making the root system an excellent subsoil aerator, drought tolerant, will tolerate a pH range of 5 to 9, nutrient uptake increases on sandy soils, self-pollinator, medium water use required, forms arbuscular mycorrhizal associations.

» Disadvantages: requires fertile soils, mature plants terminated by frost-killed become quite woody.

***Sudangrass (Sorghum bicolor)***

» Advantages: tall fast-growing heat-loving summer annual, suppress some nematodes species, seedling/shoots/leaves and roots secrete allelopathic compounds that suppress weeds, has an aggressive root system that relieves compaction, mowing stalks increases root mass 5-8 times compared with un-mowed stalks and forces the roots to penetrate deeper, making the root system an excellent subsoil aerator, drought tolerant, will tolerate a pH range 5-9, nutrient uptake increases on sandy soils, self-pollinator, medium water use required, forms arbuscular mycorrhizal associations.

» Disadvantages: requires fertile soils, frost damaged plants can cause prussic acid poisoning in livestock, drought stressed plants can cause nitrate poisoning, host for Penetrans Root-Lesion Nematode.

***White Clover (Trifolium repens)***

» Advantages: crude protein 24-30%, forms arbuscular mycorrhizal associations, flowers attracts bees.

» Disadvantages: will not tolerate droughty soils and has a shallow root system.

*Triticale, Winter (Triticum x Secale)*

» Advantages: crude protein: hay 9-16%, grain 17%, self-pollinator, forms arbuscular mycorrhizal associations, excellent weed suppressor and excellent for grazing.

» Disadvantages: seed is more expensive than wheat or rye.

*Wheat, Winter/Spring (Triticum aestivum)*

» Advantages: excellent weed suppressing crop, can be over-seeded into corn or soybeans, produces a tremendous amount of biomass, excellent nitrogen scavenger.

» Disadvantages: host for Penetrans Root-Lesion Nematode, when planted in rotation with other small grains within a year there can be disease problems (especially with tan spot).

## Termination of Cover Crops:

Cover crops will be terminated by frost, harvest or grazing for forage, roller crimping, tillage, and/or with proper herbicide selection. Timely termination of in season cover crops is required to reduce soil moisture depletion, nitrogen immobilization, allelopathy and to prevent unwanted re-seeding. Timing of cover crop termination must meet the purpose of the cover crop as specified in the conservation plan. Manage cover crop surface residue and biomass production to meet objectives specified in the conservation plan. In vineyards and small fruit operations, grow cover crop in aisles, mow as necessary for mulch cover and maintain as short stubble. Adjust nitrogen application rates for the subsequent crop based on nitrogen credits for specific cover crop species from University of Wisconsin nutrient guidelines.

(a) Herbicide Termination:

Herbicide selection for termination must be made by a Certified Pesticide Applicator, Certified Crop Advisor or qualified Extension Specialist following pesticide labeling and must be compatible with the following main crop to grown.

(b) Winter Kill Termination:

Insure that planned cover and biomass production levels can be achieved for the specific cover crop purpose from the conservation plan when using cover crop species that terminate by frost or winter kill. When the objective of the conservation plan is to allow fall manure applications to in high Nitrogen Leaching soils, winter kill termination is not an option and winter hardy cover crops must be used.

(c) Grazing/Haying Termination:

Cover crops grazed or harvested for forage as a termination method will have a specified amount of target residual biomass left in the field to meet the cover crop objective(s) outlined in the conservation plan. Employ additional termination methods as needed once grazing/haying has concluded and target biomass is achieved and documented. When cover crops are grazed, potential adverse reactions from cover crop consumption by grazing animals must be monitored at all times.

(d) Tillage Termination:

Use inversion type tillage implements that will adequately bury and kill the cover crop.

(e) Roller/Crimper Termination:

Rolling/crimping will take place at the proper cover crop growth stage to limit regrowth potential. For small grains this stage is at the boot or grain head stage, for legumes the flowering stage. Direction of rolling/crimping will coincide with planting direction when no-till planting the subsequent crop. Crimpers must break the plant stems in three or more places to be effective. Crimping must be done prior to seed set stage in order to prevent tillering or reseeding of the cover crop.

For additional NRCS cover crop termination criteria refer to: "NRCS Cover Crop Termination Guidelines". http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/

## References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Midwest Cover Crop Decision Tool: http://mcccdev.anr.msu.edu/

Planting Winter Cereal Rye after Corn Silage: http://www.soils.wisc.edu/extension/covercrop.php

NRCS Cover Crop Termination Guidelines: http://www.nrcs.usda.gov/wps/portal/nrcs/main/ national/landuse/crops/

National Agricultural Aviation Association website: http://www.agaviation.org/

UW Extension Publications: Cover Crop Termination, Forage Herbicide Quick Sheet – Cereal Rye Forage after Corn Silage, Forage Herbicides Quick Sheet – Spring-Seeded Forages after Corn and Herbicide Rotation Restrictions in Forage and Cover Cropping Systems located at the Wisconsin Crop Weed Science Website: http://wcws.cals.wisc.edu

## Table 1: Cover Crop Species Recommended for Planting in Wisconsin

| Species | [1] Minimum Seeding Rate in lbs. bu./ac. (incorporated seed) | | [2] Minimum Seeding Rate in lbs. bu./ac. (non-incorporated seed) | | Seeding Date (statewide) | Planting Depth (inches) |
|---|---|---|---|---|---|---|
| GRASSES | lbs. | bu. | lbs. | bu. | | |
| Annual Ryegrass (Lolium multiflorum) | 15 | 0.7 | 20 | 0.8 | 4/10-6/1, 8/1-9/1 | ¼ to ½ |
| Barley, Spring (Hordeum vulgare) | 50 | 1.0 | 63 to 75 | 1.3 to 1.6 | 4/10-6/15, 7/15-9/1 | ¾ to 1½ |
| *Japanese Millet (Echinochloa frumentacea) | 22 | 0.5 | 28 | 0.6 | 6/1-7/15 | ½ to ¾ |
| *Sorghum Sudangrass (Sorghum bicolor x S. bicolor var. Sudanese) | 28 | 0.6 | 33 | 0.7 | 6/1-7/15 | ½ to 1½ |
| *Sudangrass (Sorghum biclor) | 28 | 1.0 | 33 | 1.2 | 6/1-7/15 | ½ to 1 |
| *Pearl Millet (Pennisetum glaucum) | 22 | 0.5 | 28 | 0.6 | 6/1-7/15 | ½ to ¾ |
| Wheat, Spring (Triticum aestivum) | 50 | 0.8 | 70 to 90 | 1.2 to 1.5 | 4/10-6/15, 7/15-9/1 | ¾ to 1½ |
| Barley, Winter (Hordeum vulgare) | 50 | 1.0 | 63 to 75 | 1.3 to 1.6 | 8/15-9/15 | ¾ to 1½ |
| Cereal Rye, Winter (Secale cereale) | 60 | 0.9 | 90 to 120 | 1.6 to 2.1 | 7/15-10/15 | ¾ to 1½ |
| Oats (Avena sativa) | 30 | 0.9 | 45 to 60 | 1.4 to 1.9 | 4/10-9/1 | ½ to 1½ |
| Wheat, Winter (Triticum aestivum) | 50 | 0.8 | 70 to 90 | 1.2 to 1.5 | 8/1-10/1 | ¾ to 1½ |
| Triticale, Winter (Triticum x Secale) | 50 | 1.0 | 70 to 90 | 1.3 to 1.9 | 8/1-10/1 | ¾ to 1½ |
| NON-LEGUMES BROADLEAF | lbs. | bu. | lbs. | bu. | | |
| *Buckwheat (Fagopyrum esculentum) | 20 | 0.4 | 35 | 0.7 | 5/15-8/1 | ½ to 1 |
| **Oilseed Radish (Raphanus sativus) | 4 | -- | 12 | -- | 4/10-6/15, 7/15-8/15 | ½ to ¾ |
| *Sunflower (Helianthus annuus) (part of a mix) | 1 | -- | 2 | -- | 6/1-7/15 | 1 to 1½ |
| *Chicory (Cichorium intybus) (part of a mix) | 1 | -- | 2 | -- | 4/10-6/1, 8/1-9/1 | ½ to ¾ |
| Rapeseed/Canola (Brassica napus) | 2 | -- | 6 | -- | 4/10-6/15, 8/1-8/15 | ½ to ¾ |
| Forage Turnips (Brassica rapa) | 1 | -- | 5 | -- | 4/10-6/15, 7/15-8/15 | ¼ to ½ |
| LEGUMES | lbs. | bu. | lbs. | bu. | | |
| Alfalfa (Medicago sativa) | 13 | -- | 16 | -- | 4/15-6/1, 8/1-8/30 | ¼ to ½ |
| Berseem Clover (Trifolium alexandrinum) | 9 | -- | 17 | -- | 6/1-8/1 | ¼ to ½ |
| *Cowpea (Vigna unguiculata) | 55 | 0.9 | 99 | 1.7 | 6/1-7/15 | 1 to 1½ |
| *Field Pea (Pisum satuvum) | 65 | 2.6 | 100 | 4.0 | 4/10-6/15 | 1 to 1½ |
| Hairy Vetch (Vicia villosa) | 15 | -- | 20 | -- | 4/10-6/15, 7/15-9/15 | 1 to 1½ |
| *Peas, Winter (Pisum sativum subsp. arvense) | 65 | 2.6 | 100 | 4.0 | 8/1-9/1 | 1 to 1½ |
| Red Clover (Trifolium pratense) | 9 | -- | 13 | -- | 4/10-8/15 | ¼ to ½ |
| White Clover (Trifolium repens) | 7 | -- | 9 | -- | 4/15-6/1, 8/1-8/30 | ¼ to ½ |
| Crimson Clover (Trifolium incarnatum) | 11 | -- | 17 | -- | 6/1-8/1 | ¼ to ½ |

[1] Incorporated seed—Seeding methods used that provide good seed to soil contact (drilled, no-tilled, or broadcast and incorporated).

[2] Non-incorporated seed—Seeding methods used when broadcasting seed without mechanical incorporation (aerial, over-seeding/inter-seeding and frost seeding.

Cover crop seed mixture designs must include a minimum of 1 pound of seed per specie planted.

* Species with asterisk are not recommended for aerial seeding. Large seed legumes (cowpea, etc.) and summer annuals (Japanese millet, etc.) require adequate seed to soil contract.

** Spring seeding of oil seed radish must include the termination strategy to prevent the production of viable seed.

## Table 2: Identification and Comparison of Cover Crop Performance and Benefits by Species

| Species | Use [1] | N-Source | SoilBuilder | Erosion Fighter | Weed Fighter | Pest Fighter | N-Scavenger | Grazing | Quick Growth | Non-Fragile Residue | Pollinator | Deep Rooted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alfalfa (Medicago sativa) [3] | C | 4 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 4 |
| Annual Ryegrass (Lolium multiflorum) | C | 0 | 3 | 3 | 2 | 2 | 3 | 4 | 4 | 2 | 0 | 2 |
| Barley, Spring (Hordeum vulgare) | C | 0 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 4 | 0 | 2 |
| Berseem Clover (Trifolium alexandrinum) [3] | C | 4 | 2 | 2 | 2 | 1 | 1 | 4 | 2 | 1 | 3 | 1 |
| Buckwheat (Fagopyrum esculentum) | C | 0 | 2 | 3 | 3 | 1 | 3 | 1 | 4 | 0 | 4 | 4 |
| Canola/Rapeseed (Brassica napus) | C | 0 | 2 | 3 | 2 | 1 | 3 | 4 | 4 | 1 | 3 | 3 |
| Cereal Rye, Winter (Secale cereale) | C | 0 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 0 | 3 |
| Chicory (Cichorium intybus) | E | 0 | 2 | 2 | 2 | 0 | 2 | 3 | 2 | 1 | 2 | 3 |
| Cowpea (Vigna unguiculata) | C | 3 | 2 | 2 | 2 | 0 | 2 | 3 | 3 | 1 | 2 | 1 |
| Crimson Clover (Trifolium incarnatum) | E | 3 | 2 | 3 | 2 | 1 | 2 | 4 | 3 | 1 | 4 | 2 |
| Field Pea (Pisum satuvum) | C | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| Forage Turnips (Brassica rapa) | C | 0 | 1 | 3 | 2 | 0 | 3 | 4 | 3 | 1 | 1 | 1 |
| Forage/Oilseed Radish (Raphanus sativus) | E | 0 | 2 | 3 | 2 | 1 | 4 | 3 | 3 | 1 | 3 | 3 |
| Hairy Vetch (Vicia villosa) | C | 4 | 2 | 2 | 3 | 2 | 1 | 0 | 2 | 1 | 2 | 4 |
| Japanese Millet (Echinochloa frumentacea) | C | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 1 | 3 |
| Oats (Avena sativa) | C | 0 | 3 | 3 | 3 | 2 | 3 | 4 | 4 | 2 | 0 | 2 |
| Peas, Winter (Pisum sativum subsp. arvense) | C | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 2 |
| Pearl Millet (Pennisetum glaucum) | C | 0 | 3 | 3 | 4 | 2 | 3 | 4 | 4 | 4 | 1 | 2 |
| Red Clover (Trifolium pratense)3 | C | 4 | 3 | 3 | 3 | 1 | 2 | 4 | 3 | 2 | 4 | 3 |
| Sorghum-Sundangrass (Sorghum bicolor x S. bicolor var. Sudanese) | C | 0 | 4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 |
| Sunangrass (Sorghum biclor) | C | 0 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 3 |
| Sunflower (Helianthus annuus) | E | 0 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | 4 |
| Triticale, Winter (Triticum x Secale) | C | 0 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 4 | 0 | 2 |
| Wheat, Spring/Winter (Triticum aestivum) | C | 0 | 3 | 3 | 3 | 2 | 3 | 4 | 3 | 4 | 0 | 2 |
| White Clover (Trifolium repens) [3] | C | 2 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 0 |

[1] Use: C=Common Use – Considerable state knowledge regarding species use.
E=Emerging Use – Limited state knowledge regarding species use.

[2] Attribute Ratings: 0=Poor, 1=Fair, 2=Good, 3=Very Good, 4=Excellent

[3] Legumes such as alfalfa and red clover may cause bloating of ruminant animals. Take necessary precautions to prevent bloat when grazing cover crops that contain these legumes.

## Table 3: Morphology, Physiology and Growth Requirements

| Species | Life Cycle | Growth Height | Preferred pH | Minimum Germination Temp | Heat Toler-ance | Drought Tolerance | Shade Tolerance | Flood Tolerance | Low Fertility Tolerance | Winter Suviv-al Dry Matter Production (.b/ac/yr) | | Termination Information |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRASSES | | | | | | | | | | | | |
| Annual Ryegrass (Lolium multiflorum) | winter annual | upright | 5.5 - 7.0 | 40 | good | good | very good | very good | good | seldom | 1000 - 6000 | freeze, tillage, chemical |
| Barley, Spring (Hordeum vulgare) | cool season annual | upright | 6 to 8 | 38 | fair | good | fair | good | very good | never | 2000 - 5000 | freeze, tillage, mow, chemical, roller crimper |
| Barley, Winter (Hordeum vulgare) | winter annual | upright | 6.0 - 8.0 | 38 | fair | good | fair | good | very good | expected | 2000 - 5000 | tillage, mow, chemical, roller crimper |
| Cereal Rye, Winter (Secale cereale) | cool season annual | upright | 5.0 - 7.0 | 34 | fair | very good | good | very good | excellent | expected | 2500 - 6000 | freeze, tillage, mow, chemical, roller crimper |
| Japanese Millet (Echinochloa frumentacea) | summer annual | upright | 4.6 - 7.0 | 65 | excellent | excellent | fair | fair | very good | never | 1500 - 3500 | freeze, tillage, chemical |
| Oats (Avena sativa) | cool season annual | upright | 4.5 - 6.0 | 38 | fair | good | good | very good | very good | never | 2000 - 6000 | freeze, mow, tillage, chemical |
| Pearl Millet (Pennisetum glaucum) | summer annual | upright | 5.5 - 7.0 | 65 | excellent | excellent | fair | fair | excellent | never | 2000 - 6000 | freeze, tillage, chemical |
| Sorghum-Sundangrass (Sorghum bicolor x S. bicolor var. Sudanese) | summer annual | upright | 5.5 - 7.0 | 65 | excellent | excellent | fair | good | good | never | 3000 - 8000 | freeze, tillage, chemical |
| Sunangrass (Sorghum biclor) | summer annual | upright | 5.5 - 7.0 | 65 | excellent | excellent | fair | good | good | never | 3000 - 8000 | freeze, tillage, chemical |
| Triticale, Winter (Triticum x Secale) | winter annual | upright | 5.2 - 7.0 | 38 | fair | good | fair | good | good | expected | 2000 - 5000 | tillage, mow, chemical, roller crimper |
| Wheat, Spring (Triticum aestivum) | cool season annual | upright | 6.0 - 7.0 | 38 | fair | good | fair | good | good | never | 2000 - 5000 | freeze, tillage, mow, chemical, crimper |
| Wheat, Winter (Triticum aestivum) | winter annual | upright | 6.0 - 7.0 | 38 | fair | good | good | good | good | expected | 2000 - 5000 | tillage, mow, chemical, roller crimper |
| NON-LEGUMES BROADLEAF | | | | | | | | | | | | |
| Buckwheat (Fagopyrum esculentum) | summer annual | upright to semi-upright | 5.0 - 7.0 | 50 | excellent | good | fair | fair | very good | never | 1500 - 2500 | freeze, tillage, chemical, mow |
| Chicory (Cichorium intybus) (part of a mix) | short-lived perennial | upright | 5.0 - 7.0 | 50 | very good | very good | good | good | very good | expected | 1500 - 2000 | tillage chemical |
| Forage Turnips (Brassica rapa) | cool season annual | upright | 5.3 - 6.0 | 45 | good | fair | good | fair | good | seldom | 1200 - 3000 | freeze, tillage, chemical |
| Oilseed Radish (Raphanus sativus) | cool season annual | upright | 6.0 - 7.0 | 45 | good | very good | good | fair | good | seldom | 1200 - 3000 | freeze, tillage, chemical |
| Rapeseed/Canola (Brassica napus) | winter/cool season | upright | 5.5 - 8.0 | 41 | good | good | good | fair | good | seldom | 1000 - 2500 | freeze, tillage, chemical |
| Sunflower (Helianthus annuus) (part of a mix) | summer annual | upright | 5.7 - 8.0 | 44 | excellent | excellent | good | fair | very good | never | 250 - 500 | freeze, tillage, chemical, mow |
| LEGUMES | | | | | | | | | | | | |
| Alfalfa (Medicago sativa) | cool season perennial | upright | 6.5 - 7.0 | 42 | good | good | fair | poor | poor | expected | 3000 - 8000 | tillage chemical |
| Berseem Clover (Trifolium alexandrinum) | summer annual | upright | 5.0 - 7.0 | 42 | very good | good | fair | fair | fair | never | 1200 - 3000 | freeze, tillage, chemical |
| Cowpea (Vigna unguiculata) | summer annual | semi-upright to climbing | 5.5 - 6.0 | 58 | excellent | very good | fair | very good | very good | never | 2000 - 3600 | freeze, tillage, chemical, mow |
| Crimson Clover (Trifolium incarnatum) | winter annual | upright to semi-upright | 5.5 - 7.0 | 42 | very good | good | fair | very good | very good | never | 3500 - 5500 | freeze, tillage, chemical |
| Field Pea (Pisum satuvum) | cool season annual | climbing | 6.0 - 7.0 | 41 | fair | fair | fair | fair | fair | seldom | 1200 - 3000 | tillage, mow, chemical |
| Hairy Vetch (Vicia villosa) | winter/cool season annual | climbing | 5.5 - 7.0 | 60 | fair | good | good | good | good | expected | 1800 - 4000 | tillage, chemical, roller crimper |
| Peas, Winter (Pisum sativum subsp. arvense) | winter annual | climbing | 6.0 - 7.0 | 41 | fair | fair | fair | fair | fair | seldom or expected | 1200 - 3000 | tillage, mow, chemical |
| Red Clover (Trifolium pratense) | short-lived perennial | upright | 5.0 - 8.0 | 41 | very good | good | very good | good | very good | expected | 2000 - 5000 | tillage chemical |
| White Clover (Trifolium repens) | cool season annual | upright | 5.5 - 6.5 | 42 | fair | fair | fair | good | fair | expected | 600 - 1000 | tillage chemical |

**Table 4: Recommended Cover Crop Mixtures for Planting in Wisconsin**

| Species | Seeding Rate Drill/Broadcast | Seeding Date (statewide) | Planting Depth (inches) |
|---|---|---|---|
| COCKTAIL MIXTURES | | | |
| Forage/Oilseed Radish (50%) | 4-12 lbs./ac | 8/1-9/1 | ¾ to 1 |
| Peas, Winter (50%) | 65-100 lbs./ac | | |
| Cereal Rye, Winter (50%) | 60-120 lbs./ac | 7/15-9/15 | ½ to 1½ |
| Hairy Vetch (50%) | 15-20 lbs./ac | | |
| Annual Ryegrass (60%) | 15-20 lbs./ac | 4/10-6/1, 8/1-9/1 | ¼ to ½ |
| Oilseed Radish (40%) | 4-12 lbs./ac | | |
| Berseem Clover (50%) | 9-17 lbs./ac | 6/1-8/1 | ½ to ¾ |
| Oats (50%) | 30-60 lbs./ac | | |
| Oats (60%) | 30-60 lbs./ac | 4/10-6/15, 7/15-9/1 | ½ to ¾ |
| Oilseed Radish (40%) | 4-12 lbs./ac | | |
| Oats (60%) | 30-60 lbs./ac | 6/1-6/15, 7/15-9/1 | ¼ to ½ |
| Peas, Winter (40%) | 65-100 lbs./ac | | |
| Oilseed Radish (40%) | 4-12 lbs./ac | 8/1-9/1 | ¾ to 1 |
| Hairy Vetch (60%) | 15-20 lbs./ac | | |
| Oats (60%) | 30-60 lbs./ac | 4/10-6/15, 7/15-9/1 | ¾ to 1 |
| Oilseed Radish (40%) | 4-12 lbs./ac | | |
| Field Pea (20%) | 65-100 lbs./ac | | |
| Oats (60%) | 30-60 lbs./ac | 5/1-6/15, 7/15-9/1 | ½ to 1 |
| Annual Ryegrass (20%) | 15-20 lbs./ac | | |
| Crimson Clover (20%) | 11-17 lbs./ac | | |
| Field Pea (20%) | 65-100 lbs./ac | 5/1-6/15, 7/15-9/1 | ½ to 1 |
| Oats (30%) | 30-60 lbs./ac | | |
| Pearl Millet (20%) | 22-28 lbs./ac | | |
| Forage Turnips (15%) | 1-5 lbs./ac | | |
| Crimson Clover (15%) | 11-17 lbs./ac | | |
| Field Pea (30%) | 65-100 lbs./ac | 5/1-6/15, 7/15-9/1 | ½ to 1 |
| Rapeseed/Canola (5%) | 1-5 lbs./ac | | |
| Crimson Clover (20%) | 11-17 lbs./ac | | |
| Oats (40%) | 30-60 lbs./ac | | |
| Sunflower (5%) | 1-2 lbs./ac | | |

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

**Farm** has 17 fields totalling 505.3 acres
**Farm Narrative:** General Farm Notes:
Malm's Rolling Acres has 505 acres under tillage and primarily has corn, soybeans and alfalfa planted. Currently there are 115 milking cows, 30 dry cows, 70 heifers, and 30 calves. Additionally there are also aproximately 80 beef cattle on the farm.

Manure Storage/Spreading:
The Malm's have pit storage on the farm and haul manure in the spring and the fall of each year. There is also some solid manure and it is also hauled in the spring and fall. Solid manure may be stacked in the summer and winter when it is prohibitive to haul. Please see the spreading plan report for specific fields and rates of all manure applications.

Crops:
The Malm's currently have a eight year crop rotation that is subject to adjustments on a field by field basis as needed due to winter kill, pest management, soil fertility, balancing of grain and forage requirements for the herd, and other environmental factors. The rotation consists corn, soybeans, corn, soybeans, alfalfa seeded, and then alfalfa for three years.
Generally we will assume the following yield goals:
Corn (30" rows) Grain -- 150 bu./acre
Corn (30" rows) Silage -- 20 tons/acre
Soybeans -- 50 bu./acre
Alfalfa -- 5 ton/acre

Management Concerns:
All of the fields meet 'T' for tollerable soil loss and all fields have a 'PI' below 6.
There is one field with a soil test P above 50 ppm.
Three fields partially lie within a SWQMA. Fields BE, D1, and E all lie within 1000 feet of a pond or 300 feet of a stream. All manure withing these areas is incorporated within 72 hours of spreading.
Fields Be, BW2, D1, Ef, G-1 have winter spreading restricions with parts of the field have a slope 9% or greater.
There are no fields with restrictive soil types.

Summary:
Sampling is up to date. New sampling will be completed in the fall of 2016. This nutrient management plan will be updated annually according to the 590 standard. Field David north and David south have been added to the farm in 2017 sampling will be complete in the spring of 2017 to remain in compliance.

**Annual Farm Notes:**

No Annual Farm Notes

MALM
ATTACHMENT E

**Spreader Calibration Methods:** Custom applications

**Narrative and Crops:**

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 |
| AS | 16.9 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 |
| BE | 38 | Soybeans 30-36 inch row No Till 46-55 | Corn grain No Till 151-170 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Alfalfa/Grass Seeding Spring Spring vertical tillage 2.6-3.5 |
| BW1 | 25 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 |
| BW2 | 23 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 |
| BWN | 35 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 |
| C1 | 20.6 | Soybeans 30-36 inch row No Till 46-55 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 |
| C2 | 17 | Soybeans 30-36 inch row No Till 46-55 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 | Sorghum-sudan forage Spring Cultivation 5-7 | Corn grain No Till 151-170 | Soybeans 30-36 inch row No Till 46-55 |

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| C3 | 32 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 |
| C4 | 6 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 |
| D1 | 58.4 | Sorghum-sudan forage<br>Spring Cultivation<br>5-7 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Alfalfa Seeding Spring<br>Spring vertical tillage<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |
| David North | 16 | Alfalfa Seeding Spring<br>Spring vertical tillage<br>2.6-3.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn grain<br>No Till<br>151-170 |
| David South | 33 | Alfalfa Seeding Spring<br>Spring vertical tillage<br>1.0-2.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn grain<br>No Till<br>151-170 |
| EF | 69.2 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Alfalfa<br>None<br>4.6-5.5 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 |
| G-1 | 46.6 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 | Alfalfa/Grass Seeding Spring<br>Spring vertical tillage<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |
| G-2 | 7.3 | Corn silage to small grain cover crop<br>No Till, cover crop no till<br>20.1-25 | Soybeans 30-36 inch row<br>No Till<br>46-55 | Alfalfa/Grass Seeding Spring<br>Spring vertical tillage<br>1.0-2.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 | Alfalfa/Brome<br>None<br>4.6-5.5 |

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| H-1 | 41.8 | Corn grain<br>No Till<br>151-170 | Soybeans 30-36<br>inch row<br>No Till<br>46-55 | Corn grain<br>No Till<br>151-170 | Sorghum-sudan<br>forage<br>Spring Cultivation<br>5-7 | Soybeans 30-36<br>inch row<br>No Till<br>46-55 | Corn grain<br>No Till<br>151-170 |

**Summary by Crop:**

**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

| Crops Grouped By Category | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Corn grain | Acres | 78<br>12,519 | 76<br>12,198 | 125<br>20,063 | 74<br>11,877 | 98<br>15,729 | 114<br>18,297 |
| Sorghum-sudan forage | Acres | 58<br>348 | 83<br>498 | 74<br>444 | 79<br>474 | 61<br>366 | 36<br>216 |
| Soybeans 30-36 inch row | Acres | 159<br>8,030 | 132<br>6,666 | 96<br>4,848 | 121<br>6,111 | 116<br>5,858 | 167<br>8,434 |
| Alfalfa/Grass Seeding Spring | Acres | | | 54<br>95 | | | 38<br>116 |
| Alfalfa | Acres | 107<br>540 | 156<br>788 | 118<br>596 | 118<br>596 | 49<br>247 | |
| Corn silage to small grain cover crop | Acres | 54<br>1,218 | 58<br>1,308 | 38<br>857 | 58<br>1,308 | 69<br>1,556 | 38<br>857 |
| Alfalfa Seeding Spring | Acres | 49<br>149 | | | | 58<br>102 | |
| Alfalfa/Brome | Acres | | | | 54<br>273 | 54<br>273 | 112<br>566 |

# FM6: Soil Test Report

| Reported For | Malms Rolling Acres |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2017-01-30 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| AN | | 19.5 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 4 | 4 | 6.9 | 3.6 | 10 | 39 | 0 | 12 |
| AS | | 16.9 | WeA | WITHEE | 2016-11-03 | Dairyland Labs | 8S4050 | 3 | 4 | 6.8 | 3.2 | 11 | 41 | 0 | 11 |
| BE | | 38 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 8 | 8 | 6.8 | 3.5 | 26 | 113 | 0 | 11 |
| BW1 | | 25 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 5 | 5 | 6.9 | 3.8 | 20 | 67 | 7.5 | 12 |
| BW2 | | 23 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 5 | 5 | 6.8 | 4.0 | 25 | 70 | 0 | 14 |
| BWN | | 35 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 7 | 7 | 6.7 | 3.2 | 17 | 42 | 0 | 10 |
| C1 | | 20.6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 4 | 5 | 6.6 | 4.3 | 21 | 62 | 0 | 14 |
| C2 | | 17 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 3 | 3 | 6.8 | 4.1 | 24 | 81 | 0 | 13 |
| C3 | | 32 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 6 | 7 | 6.5 | 3.8 | 20 | 66 | 0 | 13 |
| C4 | | 6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | 1 | 2 | 6.6 | 4.1 | 28 | 76 | 0 | 13 |
| D1 | | 58.4 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | 12 | 12 | 6.9 | 3.1 | 14 | 48 | 0 | 11 |
| David North | | 16 | LoB | LOYAL | 2017-04-20 | Dairyland Labs | 8S8697 | 3 | 4 | 7.2 | 3.4 | 72 | 112 | 0 | 14 |
| David South | | 33 | LoB | LOYAL | 2017-04-20 | Dairyland Labs | 8S8697 | 7 | 7 | 6.5 | 3.2 | 39 | 119 | 0 | 11 |

*SnapPlus Soil Test Report*

09/06/2018

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| EF | | 69.2 | LoB | LOYAL | 2016-11-03 | Dairyland Labs | 8S4050 | **14** | **14** | 6.6 | 3.3 | 13 | 50 | 0 | 10 |
| G-1 | | 46.6 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | **9** | **8** | 6.3 | 3.2 | 14 | 40 | 0 | 11 |
| G-2 | | 7.3 | LoB | LOYAL | 2016-10-11 | Dairyland Labs | 8S2910 | **1** | **2** | 6.4 | 3.8 | 13 | 37 | 0 | 12 |
| H-1 | | 41.8 | HeB | HILES | 2016-11-03 | Dairyland Labs | 8S4050 | **8** | **9** | 6.3 | 2.8 | 12 | 50 | 0 | 8 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| AN | 2016-11-03 | | | | | | X | | |
| AS | 2016-11-03 | | | | | | X | | |
| BE | 2016-10-11 | | | | | | X | | |
| BW1 | 2016-10-11 | | | | | | X | | |
| BW2 | 2016-10-11 | | | | | | X | | |
| BWN | 2016-11-03 | | | | | | X | | |
| C1 | 2016-10-11 | | | | | | X | | |
| C2 | 2016-10-11 | | | | | | X | | |
| C3 | 2016-10-11 | | | | | | X | | |
| C4 | 2016-10-11 | | | | | | X | | |
| D1 | 2016-11-03 | | | | | | X | | |
| David North | 2017-04-20 | | | | | | X | | |
| David South | 2017-04-20 | | | | | | X | | |
| EF | 2016-11-03 | | | | | | X | | |
| G-1 | 2016-10-11 | | | | | | X | | |
| G-2 | 2016-10-11 | | | | | | X | | |
| H-1 | 2016-11-03 | | | | | | X | | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Liquid | Production (Gallons) | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 |
| | Used (Gallons) | 1,601,000 | 1,655,400 | 1,669,800 | 1,655,000 | 1,665,500 | 1,659,660 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 |
| | Dry Matter (%) | 6 | 6 | 6 | 6 | 6 | 6 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Solid | Production (Tons) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Used (Tons) | 1,500 | 1,494 | 1,498 | 1,500 | 1,500 | 1,500 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Application Results Reported For Farm All

**Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.**

| | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 24,420 | 24,420 | 24,420 | 24,420 | 24,420 | 24,420 |
| | P2O5 | 14,460 | 14,460 | 14,460 | 14,460 | 14,460 | 14,460 |
| | K2O | 37,220 | 37,220 | 37,220 | 37,220 | 37,220 | 37,220 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 23,712 | 24,347 | 24,532 | 24,360 | 24,486 | 24,416 |
| | P2O5 | 14,106 | 14,414 | 14,513 | 14,430 | 14,493 | 14,458 |
| | K2O | 36,217 | 37,106 | 37,375 | 37,135 | 37,314 | 37,214 |
| Total Fertilizer Nutrients Applied (lb) | N | 13,367 | 13,077 | 13,861 | 12,033 | 12,163 | 11,016 |
| | P2O5 | 11,376 | 12,235 | 10,446 | 11,749 | 11,239 | 10,302 |
| | K2O | 47,771 | 57,389 | 50,625 | 59,985 | 58,419 | 46,311 |
| Total Crop Removal (lb) | P2O5 | 29,037 | 32,115 | 30,095 | 32,309 | 29,679 | 28,636 |
| | K2O | 84,122 | 100,193 | 87,270 | 102,836 | 84,290 | 77,461 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | -3,555 | -5,466 | -5,136 | -6,130 | -3,947 | -3,876 |
| | K2O | -134 | -5,699 | 731 | -5,716 | 11,443 | 6,064 |

# NM4: Manure Tracking Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

| Acres/ CropYear | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|
| Acres in plan | 505.3 | 505.3 | 505.3 | 505.3 | 505.3 | 505.3 |
| Acres receiving manure | 174.6 | 217.0 | 291.1 | 212.2 | 227.8 | 257.4 |

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Liquid | Production (Gallons) | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 | 1,660,000 |
| | Used (Gallons) | 1,601,000 | 1,655,400 | 1,669,800 | 1,655,000 | 1,665,500 | 1,659,660 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 | 7/10/12-6-17 |
| | Dry Matter (%) | 6 | 6 | 6 | 6 | 6 | 6 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Solid | Production (Tons) | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| | Used (Tons) | 1,500 | 1,494 | 1,498 | 1,500 | 1,500 | 1,500 |
| | Analysis Date | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Estimated Livestock Manure Production For 2018

| Animal Type | Subfarm | Barn | # of Animals | Total No. Of Days | % Collected As Solid | % Collected As Liquid | Yearly Tons | Yearly Gallons |
|---|---|---|---|---|---|---|---|---|
| Beef High Forage 1100 lbs | | | 50 | 365 | 80 | 0 | 672 | 0 |
| Beef High Forage 750 lbs | | | 30 | 365 | 80 | 0 | 272 | 0 |
| Dairy Calf 150 lbs | | | 10 | 365 | 0 | 100 | 0 | 10,220 |
| Dairy Calf 250 lbs | | | 20 | 365 | 0 | 100 | 0 | 32,850 |
| Dairy Heifer 1000 lbs | | | 25 | 365 | 60 | 0 | 224 | 0 |
| Dairy Heifer 750 lbs | | | 45 | 365 | 60 | 0 | 320 | 0 |
| Dairy Lactating Cows 1400 lbs | | | 115 | 365 | 0 | 100 | 0 | 1,343,200 |
| Dairy Dry Cows 1400 lbs | | | 30 | 365 | 0 | 100 | 0 | 273,750 |
| | | | | | | **Farm Totals** | 1,488 | 1,660,020 |

## Manure Storage For 2018

No Storages Found

## Spreaders For 2018

No Spreaders Found

# NM3: Field Data and 590 Assessment Plan

| Reported For | Malms Rolling Acres |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2017-01-30 |
| SnapPlus Version 17.1 built on 2018-05-25 | |
| M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | | | | 19.5 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / Edge | No | No | Cg-Sg30-SGf-Cg-Sg30-SGf | NT-NT-SFC-NT-NT-SFC | 2018-2023 | 4 | 1.9 | 0.6 | 1 | 10 | 18 | - |
| AS | | | | 16.9 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / Edge | No | No | Cg-Sg30-SGf-Cg-Sg30-SGf | NT-NT-SFC-NT-NT-SFC | 2018-2023 | 4 | 1.9 | 0.6 | 1 | 11 | 18 | - |
| BE | | | | 38 | Clark | LOYAL LsC | 7 | 180 | 2.1 - 6 | 0 - 300 | S % | No / Edge | No | No | Sg30-Cg-SGf-Cg-Sg30-AGs | NT-NT-SFC-NT-NT-SVT | 2018-2023 | 5 | 3 | 0.6 | 2 | 26 | -111 | - |
| BW1 | | | | 25 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg30-SGf-Cg-Sg30-Cg-Sg30 | NT-SFC-NT-NT-NT-NT | 2018-2023 | 4 | 1 | 0.6 | 2 | 20 | 6 | - |
| BW2 | | | | 23 | Clark | LOYAL LoB | 4 | 295 | 2.1 - 6 | 1001 - 5000 | % | No / No | No | No | Sg30-SGf-Cg-Sg30-SGf-Cg | NT-SFC-NT-NT-SFC-NT | 2018-2023 | 4 | 2.1 | 0.7 | 4 | 25 | -24 | - |
| BWN | | | | 35 | Clark | LOYAL LoB | 4 | 200 | 2.1 - 6 | 1001 - 5000 | | No / No | No | No | Sg30-SGf-Cg-Sg30-Cg-Sg30 | NT-SFC-NT-NT-NT-NT | 2018-2023 | 4 | 1.1 | 0.7 | 2 | 17 | 9 | - |
| C1 | | | | 20.6 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg30-Cg-Sg30-SGf-Cg-Sg30 | NT-NT-NT-SFC-NT-NT | 2018-2023 | 4 | 1.2 | 0.6 | 2 | 21 | -28 | - |
| C2 | | | | 17 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Sg30-Cg-Sg30-SGf-Cg-Sg30 | NT-NT-NT-SFC-NT-NT | 2018-2023 | 4 | 1.2 | 0.6 | 2 | 24 | -28 | - |

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | | | | 32 | Clark | LOYAL LoB | 3 | 295 | 0 - 2 | 1001 - 5000 | | No / Edge | No | No | A-A-Csl +cv-Sg30-SGf-Csl +cv | None-None-NT/NTcvr-NT-SFC-NT/NTcvr | 2018-2023 | 4 | 1.3 | 0.6 | 1 | 20 | -104 | - |
| C4 | | | | 6 | Clark | LOYAL LoB | 3 | 295 | 2.1 - 6 | 1001 - 5000 | | No / No | No | No | A-A-Csl +cv-Sg30-SGf-Csl +cv | None-None-NT/NTcvr-NT-SFC-NT/NTcvr | 2018-2023 | 4 | 1.3 | 0.5 | 2 | 28 | -119 | - |
| D1 | | | | 58.4 | Clark | HILES HeB | 4 | 295 | 2.1 - 6 | 0 - 300 | W S % | No / Edge | No | No | SGf-Csl +cv-Sg30-Csl+cv-As-AB | SFC-NT/NTcvr-NT-NT/NTcvr-SVT-None | 2018-2023 | 3 | 1.1 | 0.9 | 1 | 14 | 55 | - |
| David North | | | | 16 | Clark | LOYAL LoB | 4 | 200 | 0 - 2 | 1001 - 5000 | | No / No | No | No | As-A-A-A-A-Cg | SVT-None-None-None-None-NT | 2018-2023 | 4 | 0.6 | 0.7 | 1 | 72 | -280 | 0 |
| David South | | | | 33 | Clark | LOYAL LoB | 4 | 200 | 0 - 2 | 1001 - 5000 | | No / No | No | No | As-A-A-A-A-Cg | SVT-None-None-None-None-NT | 2018-2023 | 4 | 0.6 | 0.7 | 1 | 39 | -265 | - |
| EF | | | | 69.2 | Clark | LOYAL LoB | 4 | 295 | 0 - 2 | 301 - 1000 | S % | No / No | No | No | A-A-A-A-Csl+cv-Sg30 | None-None-None-None-NT/NTcvr-NT | 2018-2023 | 4 | 0.2 | 0.7 | 0 | 13 | -84 | - |
| G-1 | | | | 46.6 | Clark | LOYAL LsC | 7 | 200 | 2.1 - 6 | 1001 - 5000 | % | No / Edge | No | No | Csl+cv-Sg30-AGs-AB-AB-AB | NT/NTcvr-NT-SVT-None-None-None | 2018-2023 | 5 | 0.9 | 0.9 | 1 | 14 | -91 | - |
| G-2 | | | | 7.3 | Clark | LOYAL LoB | 4 | 295 | 0 - 2 | 1001 - 5000 | | No / Edge | No | No | Csl+cv-Sg30-AGs-AB-AB-AB | NT/NTcvr-NT-SVT-None-None-None | 2018-2023 | 4 | 0.6 | 0.9 | 1 | 13 | -91 | - |

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H-1 | | | | 41.8 | Clark | HILES HeB | 4 | 250 | 0 - 2 | 1001 - 5000 | | No / No | No | No | Cg-Sg30-Cg-SGf-Sg30-Cg | NT-NT-NT-SFC-NT-NT | 2018-2023 | **3** | **0.9** | **0.7** | **1** | 12 | 32 | - |

### Crop Abbreviations

| Abbreviation | Crop |
|---|---|
| A | Alfalfa |
| AB | Alfalfa/Brome |
| AGs | Alfalfa/Grass Seeding Spring |
| As | Alfalfa Seeding Spring |
| Cg | Corn grain |
| Csl+cv | Corn silage to small grain cover crop |
| Sg30 | Soybeans 30-36 inch row |
| SGf | Sorghum-sudan forage |

### Tillage Abbreviations

| Abbreviation | Tillage |
|---|---|
| None | None |
| NT | No Till |
| NT/NTcvr | No Till, cover crop no till |
| SFC | Spring Cultivation |
| SVT | Spring vertical tillage |

### Restriction Legend

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Corn grain<br>No Till | 105-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 54-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Summer Unincorp | 195 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 3,900 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 12000 gal | Fall Unincorp | 234,000 gal |
| AS | 16.9 | Soybeans 7-10 inch row<br>Spring Chisel, no disk | Corn grain<br>No Till | 140-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 19-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Spring Unincorp | 169 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 3,380 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 12000 gal | Spring Unincorp | 202,800 gal |
| BE | 38 | Corn silage to small grain cover crop<br>Fall Cultivation, cover crop no till | Soybeans 30-36 inch row<br>No Till | 0-0-34 | 0 | 20 | 14-35-105 | 34-35-105 | 34-35-71 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Spring Incorp | 2,850 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Incorp | 1,900 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Spring Incorp | 6,650 lb |
| BW1 | 25 | Corn grain<br>Fall Chisel, no disk | Soybeans 30-36 inch row<br>No Till | 0-40-53 | 0 | 14 | 14-35-105 | 28-35-105 | 28-0-52 | 0-5-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain Fall Chisel, no disk | Soybeans 30-36 inch row No Till | 0-40-53 | 0 | 14 | 14-35-105 | 28-35-105 | 28-0-52 | 0-5-0 | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Corn grain Spring Chisel, no disk | Soybeans 30-36 inch row No Till | 0-0-23 | 0 | 14 | 14-35-105 | 28-35-105 | 28-35-82 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Unincorp | 1,725 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,150 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 4,025 lb |
| BWN | 35 | Corn silage to small grain cover crop Fall Chisel, no disk , cover crop no till | Soybeans 30-36 inch row No Till | 0-40-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-5-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Corn grain Spring Chisel, disked | Soybeans 30-36 inch row No Till | 0-0-53 | 0 | 15 | 14-35-105 | 29-35-105 | 29-35-52 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,545 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,030 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 3,605 lb |
| C2 | 17 | Corn grain Fall Chisel, no disk | Soybeans 30-36 inch row No Till | 0-0-23 | 0 | 14 | 14-35-105 | 28-35-105 | 28-35-82 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,275 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 14 | 28-24-158 | 42-24-158 | 42-0-0 | 0-41-197 | Borate 0-0-0 | 10 lb | Spring Unincorp | 320 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 4,800 lb |

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 14 | 28-24-158 | 42-24-158 | 42-0-0 | 0-41-197 | Liquid 7-6-17 | 4000 gal | Fall Unincorp | 128,000 gal |
| C4 | 6 | Alfalfa None | Alfalfa None | 0-33-355 | 0 | 14 | 11-9-116 | 25-9-116 | 25-0-0 | 0-24-239 | Borate 0-0-0 | 10 lb | Spring Unincorp | 60 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 300 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 900 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 1500 gal | Fall Unincorp | 9,000 gal |
| D1 | 58.4 | Corn grain Fall Chisel, no disk | Sorghum-sudan forage Spring Cultivation | 100-120-284 | 0 | 10 | 114-131-307 | 124-131-307 | 24-11-23 | 0-0-0 | Liquid 7-6-17 | 5000 gal | Summer Unincorp | 292,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 233,600 gal |
| | | | | | | | | | | | Solid 2-3-6 | 25.7 ton | Fall Unincorp | 1,500 ton |
| David North | 16 | Soybeans 7-10 inch row Spring Chisel, disked | Alfalfa Seeding Spring Spring vertical tillage | 0-0-95 | 20 | 10 | 0-0-105 | 30-0-105 | 30-0-10 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,800 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| David South | 33 | Soybeans 7-10 inch row Spring Chisel, no disk | Alfalfa Seeding Spring Spring vertical tillage | 0-0-20 | 20 | 10 | 0-0-105 | 30-0-105 | 30-0-85 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 5,775 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| EF | 69.2 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa Seeding Spring Spring Chisel, disked | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Soybeans 7-10 inch row Fall Cultivation | Corn silage to small grain cover crop No Till, cover crop no till | 140-110-199 | 0 | 5 | 101-20-45 | 106-20-45 | 0-0-0 | 34-90-154 | 28% UAN (Liquid 28-0-0) 28-0-0 | 25 gal | Summer Unincorp | 1,165 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 9,320 lb |
| G-2 | 7.3 | Soybeans 7-10 inch row No Till | Corn silage to small grain cover crop No Till, cover crop no till | 140-110-235 | 0 | 0 | 101-20-45 | 101-20-45 | 0-0-0 | 39-90-190 | 28% UAN (Liquid 28-0-0) 28-0-0 | 25 gal | Summer Unincorp | 182 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 1,460 lb |
| H-1 | 41.8 | Soybeans 7-10 inch row Spring Chisel, no disk | Corn grain No Till | 130-72-0 | 0 | 18 | 141-92-249 | 159-92-249 | 29-20-249 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 418 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 12000 gal | Fall Unincorp | 501,600 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,462 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 975 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 3,412 lb |
| AS | 16.9 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,268 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 845 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,958 lb |
| BE | 38 | Soybeans 30-36 inch row No Till | Corn grain No Till | 140-0-0 | 0 | 0 | 142-80-215 | 142-80-215 | 2-80-215 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Spring Unincorp | 570 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 380,000 gal |
| BW1 | 25 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-90-353 | 20 | 0 | 63-77-173 | 83-77-173 | 0-0-0 | 17-13-180 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 95,000 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 450 ton |

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | | | | | | | | | | | legume | | 20-0-0 | |
| BW2 | 23 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-2-308 | 20 | 0 | 63-77-173 | 83-77-173 | 0-75-0 | 17-0-135 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 87,400 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 414 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BWN | 35 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-90-405 | 20 | 0 | 63-77-173 | 83-77-173 | 0-0-0 | 17-13-232 | Liquid 7-6-17 | 3800 gal | Summer Unincorp | 133,000 gal |
| | | | | | | | | | | | Solid 2-3-6 | 18 ton | Spring Unincorp | 630 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C1 | 20.6 | Soybeans 30-36 inch row No Till | Corn grain No Till | 140-0-38 | 0 | 0 | 156-80-215 | 156-80-215 | 16-80-177 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 412 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,120 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 206,000 gal |
| C2 | 17 | Soybeans 30-36 inch row No Till | Corn grain No Till | 140-0-0 | 0 | 0 | 156-80-215 | 156-80-215 | 16-80-215 | 0-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 340 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,400 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 170,000 gal |
| C3 | 32 | Alfalfa None | Alfalfa None | 0-65-355 | 0 | 9 | 18-46-240 | 27-46-240 | 27-0-0 | 0-19-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 320 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 1,600 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 1,600 lb |

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Alfalfa<br>None | Alfalfa<br>None | 0-65-355 | 0 | 9 | 18-46-240 | 27-46-240 | 27-0-0 | 0-19-115 | Gypsum<br>0-0-0 | 50 lb | Spring<br>Unincorp | 1,600 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Summer<br>Unincorp | 1,600 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Spring<br>Unincorp | 6,400 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Summer<br>Unincorp | 6,400 lb |
| C4 | 6 | Alfalfa<br>None | Alfalfa<br>None | 0-35-355 | 0 | 4 | 18-46-240 | 22-46-240 | 22-11-0 | 0-0-115 | Borate<br>0-0-0 | 10 lb | Spring<br>Unincorp | 60 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP)<br>18-46-0 | 50 lb | Spring<br>Unincorp | 300 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP)<br>18-46-0 | 50 lb | Summer<br>Unincorp | 300 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring<br>Unincorp | 300 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Summer<br>Unincorp | 300 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Spring<br>Unincorp | 1,200 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Summer<br>Unincorp | 1,200 lb |
| D1 | 58.4 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage to small grain cover crop<br>No Till, cover crop no till | 190-99-217 | 0 | 42 | 127-80-215 | 169-80-215 | 0-0-0 | 21-19-2 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Summer<br>Unincorp | 584 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring<br>Subsurface | 11,680 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 10000 gal | Fall<br>Unincorp | 584,000 gal |
| David North | 16 | Alfalfa Seeding Spring<br>Spring vertical tillage | Alfalfa<br>None | 0-0-290 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-50 | Borate<br>0-0-0 | 10 lb | Spring<br>Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring<br>Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Summer<br>Unincorp | 800 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 200 lb | Spring<br>Unincorp | 3,200 lb |

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| David North | 16 | Alfalfa Seeding Spring Spring vertical tillage | Alfalfa None | 0-0-290 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-50 | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa Seeding Spring Spring vertical tillage | Alfalfa None | 0-0-215 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-25 | 0-0-0 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,495 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 8,155 lb |
| G-2 | 7.3 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 548 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-2 | 7.3 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-70-115 | 0 | 0 | 14-35-105 | 14-35-105 | 14-0-0 | 0-35-10 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 1,278 lb |
| H-1 | 41.8 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-50-0 | 0 | 28 | 14-35-105 | 42-35-105 | 42-0-105 | 0-15-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,135 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,090 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 7,315 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-120-132 | 20 | 0 | 98-84-238 | 118-84-238 | 18-0-106 | 0-36-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 195,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 78,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| AS | 16.9 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-120-132 | 20 | 0 | 98-84-238 | 118-84-238 | 18-0-106 | 0-36-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 169,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 67,600 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BE | 38 | Corn grain No Till | Sorghum-sudan forage Spring Cultivation | 100-0-119 | 0 | 23 | 73-24-68 | 96-24-68 | 0-24-0 | 4-0-51 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 570 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Spring Unincorp | 152,000 gal |
| BW1 | 25 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-60-90 | 0 | 23 | 127-80-215 | 150-80-215 | 0-20-125 | 40-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 250 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 5,000 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 250,000 gal |

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW2 | 23 | Sorghum-sudan forage<br>Spring Cultivation | Corn grain<br>No Till | 190-0-75 | 0 | 23 | 127-80-215 | 150-80-215 | 0-80-140 | 40-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 10 gal | Summer Unincorp | 230 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 4,600 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 10000 gal | Spring Unincorp | 230,000 gal |
| BWN | 35 | Sorghum-sudan forage<br>Spring Cultivation | Corn grain<br>No Till | 190-60-90 | 0 | 23 | 112-80-165 | 135-80-165 | 0-20-75 | 55-0-0 | 28% UAN (Liquid 28-0-0)<br>28-0-0 | 15 gal | Fall Unincorp | 525 gal |
| | | | | | | | | | | | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 7,000 lb |
| | | | | | | | | | | | Solid<br>2-3-6 | 20 ton | Spring Unincorp | 700 ton |
| C1 | 20.6 | Corn grain<br>No Till | Soybeans 30-36 inch row<br>No Till | 0-0-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-35-105 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Fall Unincorp | 1,545 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Unincorp | 1,030 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Fall Unincorp | 3,605 lb |
| C2 | 17 | Corn grain<br>No Till | Soybeans 30-36 inch row<br>No Till | 0-0-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-35-105 | 0-0-0 | Diammonium phosphate (DAP)<br>18-46-0 | 75 lb | Spring Incorp | 1,275 lb |
| | | | | | | | | | | | Gypsum<br>0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash<br>0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Alfalfa<br>None | Corn silage to small grain cover crop<br>No Till, cover crop no till | 190-80-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-0-0 | 45-36-127 | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 6,400 lb |
| | | | | | | | | | | | Liquid<br>7-6-17 | 4000 gal | Spring Unincorp | 128,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| C4 | 6 | Alfalfa<br>None | Corn silage to small grain cover crop<br>No Till, cover crop no till | 165-29-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-15-0 | 20-0-127 | Corn Starter<br>15-11-25 | 180 lb | Spring Subsurface | 1,200 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 6 | Alfalfa None | Corn silage to small grain cover crop No Till, cover crop no till | 165-29-240 | 90 | 0 | 55-44-113 | 145-44-113 | 0-15-0 | 20-0-127 | Liquid 7-6-17 | 4000 gal | Spring Unincorp | 24,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| D1 | 58.4 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-70-115 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-0 | 0-35-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Unincorp | 4,380 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 10,220 lb |
| David North | 16 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa None | Alfalfa None | 0-0-275 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-35 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Soybeans 30-36 inch row No Till | Alfalfa/Grass Seeding Spring Spring vertical tillage | 0-55-160 | 20 | 0 | 35-56-179 | 55-56-179 | 55-1-19 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 25 lb | Fall Unincorp | 1,165 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 6,990 lb |
| | | | | | | | | | | | Solid 2-3-6 | 14.8 ton | Spring Unincorp | 690 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| G-2 | 7.3 | Soybeans 30-36 inch row No Till | Alfalfa/Grass Seeding Spring Spring vertical tillage | 0-55-160 | 20 | 0 | 35-56-179 | 55-56-179 | 55-1-19 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 25 lb | Fall Unincorp | 182 lb |
| | | | | | | | | | | | Potash 0-0-60 | 150 lb | Spring Unincorp | 1,095 lb |
| | | | | | | | | | | | Solid 2-3-6 | 14.8 ton | Spring Unincorp | 108 ton |
| | | | | | | | | | | | legume | | 20-0-0 | |
| H-1 | 41.8 | Soybeans 30-36 inch row No Till | Corn grain No Till | 130-90-0 | 0 | 0 | 135-74-198 | 135-74-198 | 5-0-198 | 0-16-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 627 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 9000 gal | Spring Unincorp | 376,200 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb**

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-90-0 | 0 | 33 | 127-80-215 | 160-80-215 | 0-0-215 | 30-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 195 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,510 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 195,000 gal |
| AS | 16.9 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-90-0 | 0 | 33 | 127-80-215 | 160-80-215 | 0-0-215 | 30-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Spring Unincorp | 169 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,380 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 169,000 gal |
| BE | 38 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-0-45 | 0 | 9 | 127-80-215 | 136-80-215 | 0-80-170 | 54-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Spring Unincorp | 380 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 380,000 gal |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-20-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-15-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,150 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Unincorp | 4,025 lb |
| BWN | 35 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-20-40 | 0 | 16 | 14-35-105 | 30-35-105 | 30-15-65 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-0-238 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-0 | 0-0-34 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 164,800 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 82,400 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C2 | 17 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-0-163 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-41 | 0-0-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 136,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 68,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C3 | 32 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-40-115 | 0 | 9 | 14-35-105 | 23-35-105 | 23-0-0 | 0-5-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,400 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 5,600 lb |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | 6 | Corn silage to small grain cover crop No Till, cover crop no till | Soybeans 30-36 inch row No Till | 0-5-115 | 0 | 9 | 14-35-105 | 23-35-105 | 23-30-0 | 0-0-10 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 450 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 300 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 1,050 lb |
| D1 | 58.4 | Soybeans 30-36 inch row No Till | Corn silage to small grain cover crop No Till, cover crop no till | 140-110-240 | 0 | 0 | 123-97-199 | 123-97-199 | 0-0-0 | 17-13-41 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 876 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 11,680 lb |
| | | | | | | | | | | | Solid 2-3-6 | 25.7 ton | Spring Unincorp | 1,500 ton |
| David North | 16 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Borate 0-0-0 | 10 lb | Spring Unincorp | 692 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Spring Unincorp | 3,460 lb |

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Alfalfa None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 3,460 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 3,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 13,840 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 13,840 lb |
| G-1 | 46.6 | Alfalfa/Grass Seeding Spring Spring vertical tillage | Alfalfa/Brome None | 0-94-336 | 0 | 12 | 18-46-240 | 30-46-240 | 30-0-0 | 0-48-96 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Grass Seeding Spring Spring vertical tillage | Alfalfa/Brome None | 0-94-336 | 0 | 12 | 18-46-240 | 30-46-240 | 30-0-0 | 0-48-96 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H-1 | 41.8 | Corn grain<br>No Till | Sorghum-sudan forage<br>Spring Cultivation | 100-120-24 | 0 | 21 | 77-66-187 | 98-66-187 | 0-0-163 | 2-54-0 | Liquid 7-6-17 | 7000 gal | Spring Unincorp | 292,600 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 167,200 gal |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-70-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,462 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 975 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 3,412 lb |
| AS | 16.9 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-70-0 | 0 | 23 | 14-35-105 | 37-35-105 | 37-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 1,268 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 845 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,958 lb |
| BE | 38 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,900 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,650 lb |
| BW1 | 25 | Soybeans 30-36 inch row No Till | Corn grain No Till | 140-45-0 | 0 | 0 | 120-74-198 | 120-74-198 | 0-29-198 | 20-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 250 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 5,000 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 9000 gal | Spring Unincorp | 225,000 gal |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW2 | 23 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-0-245 | 20 | 0 | 84-72-204 | 104-72-204 | 4-72-0 | 0-0-41 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 184,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 92,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BWN | 35 | Soybeans 30-36 inch row No Till | Corn grain No Till | 140-45-25 | 0 | 0 | 139-77-207 | 139-77-207 | 0-32-182 | 1-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Fall Unincorp | 525 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 7,000 lb |
| C1 | 20.6 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-0-90 | 0 | 28 | 156-80-215 | 184-80-215 | 0-80-125 | 6-0-0 | Liquid 7-6-17 | 9500 gal | Spring Unincorp | 332,500 gal |
| | | | | | | | | | | | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 412 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,120 lb |
| C2 | 17 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-0-34 | 0 | 28 | 156-80-215 | 184-80-215 | 0-80-181 | 6-0-0 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 206,000 gal |
| | | | | | | | | | | | 28% UAN (Liquid 28-0-0) 28-0-0 | 20 gal | Spring Unincorp | 340 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,400 lb |
| C3 | 32 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-90-405 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-0 | 0-18-201 | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 170,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 256,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 128,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| C4 | 6 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-15-405 | 20 | 0 | 84-72-204 | 104-72-204 | 4-57-0 | 0-0-201 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 48,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 24,000 gal |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C4 | | | | | | | | | | | legume | | 20-0-0 | |
| D1 | 58.4 | Corn silage to small grain cover crop No Till, cover crop no till | Alfalfa Seeding Spring Spring vertical tillage | 0-55-160 | 0 | 21 | 18-46-240 | 39-46-240 | 39-0-80 | 0-9-0 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 11,680 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 11,680 lb |
| David North | 16 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 160 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 800 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 800 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 3,200 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 3,200 lb |
| David South | 33 | Alfalfa None | Alfalfa None | 0-0-300 | 0 | 0 | 0-0-240 | 0-0-240 | 0-0-0 | 0-0-60 | Borate 0-0-0 | 10 lb | Spring Unincorp | 330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,650 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,650 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 6,600 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 6,600 lb |

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF | 69.2 | Alfalfa None | Corn silage to small grain cover crop No Till, cover crop no till | 190-110-240 | 90 | 0 | 92-85-175 | 182-85-175 | 0-0-0 | 8-25-65 | 28% UAN (Liquid 28-0-0) 28-0-0 | 0 gal | Spring Unincorp | |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 13,840 lb |
| | | | | | | | | | | | Solid 3-3-6 | 21.7 ton | Spring Incorp | 1,500 ton |
| | | | | | | | | | | | legume | | 90-0-0 | |
| G-1 | 46.6 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |
| H-1 | 41.8 | Sorghum-sudan forage Spring Cultivation | Soybeans 30-36 inch row No Till | 0-70-0 | 0 | 26 | 14-35-105 | 40-35-105 | 40-0-105 | 0-35-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 3,135 lb |

## *SnapPlus Producer's Plan Report*

09/06/2018

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H-1 | 41.8 | Sorghum-sudan forage Spring Cultivation | Soybeans 30-36 inch row No Till | 0-70-0 | 0 | 26 | 14-35-105 | 40-35-105 | 40-0-105 | 0-35-0 | Gypsum 0-0-0 | 50 lb | Spring Incorp | 2,090 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 7,315 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **Malms Rolling Acres** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2017-01-30** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb** | |

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

## Field Data: 505.3 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AN | 19.5 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-120-184 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-20 | 0-48-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 156,000 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 78,000 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| AS | 16.9 | Soybeans 30-36 inch row No Till | Sorghum-sudan forage Spring Cultivation | 100-120-184 | 20 | 0 | 84-72-204 | 104-72-204 | 4-0-20 | 0-48-0 | Liquid 7-6-17 | 8000 gal | Spring Unincorp | 135,200 gal |
| | | | | | | | | | | | Liquid 7-6-17 | 4000 gal | Summer Unincorp | 67,600 gal |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BE | 38 | Soybeans 30-36 inch row No Till | Alfalfa/Grass Seeding Spring Spring vertical tillage | 0-0-0 | 20 | 0 | 0-0-60 | 20-0-60 | 20-0-60 | 0-0-0 | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,900 lb |
| | | | | | | | | | | | Potash 0-0-60 | 100 lb | Spring Unincorp | 3,800 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| BW1 | 25 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-11-0 | 0 | 21 | 14-35-105 | 35-35-105 | 35-24-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Summer Subsurface | 1,875 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 1,250 lb |

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BW1 | 25 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-11-0 | 0 | 21 | 14-35-105 | 35-35-105 | 35-24-105 | 0-0-0 | Potash 0-0-60 | 175 lb | Spring Subsurface | 4,375 lb |
| BW2 | 23 | Sorghum-sudan forage Spring Cultivation | Corn grain No Till | 190-0-75 | 0 | 28 | 120-92-188 | 148-92-188 | 0-92-113 | 42-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 345 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 4,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 0 gal | Spring Unincorp | |
| | | | | | | | | | | | Solid 2-3-6 | 23.9 ton | Fall Unincorp | 550 ton |
| BWN | 35 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-8-0 | 0 | 22 | 14-35-105 | 36-35-105 | 36-27-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 75 lb | Spring Incorp | 2,625 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 1,750 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 6,125 lb |
| C1 | 20.6 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 0 lb | Fall Unincorp | |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 1,030 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Fall Unincorp | 3,605 lb |
| C2 | 17 | Corn grain No Till | Soybeans 30-36 inch row No Till | 0-0-0 | 0 | 23 | 0-0-105 | 23-0-105 | 23-0-105 | 0-0-0 | Diammonium phosphate (DAP) 18-46-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Incorp | 850 lb |
| | | | | | | | | | | | Potash 0-0-60 | 175 lb | Spring Incorp | 2,975 lb |
| C3 | 32 | Sorghum-sudan forage Spring Cultivation | Corn silage to small grain cover crop No Till, cover crop no till | 190-80-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-15-0 | 55-0-45 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Summer Unincorp | 320 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 6,400 lb |

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | 32 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage to small grain cover crop<br>No Till, cover crop no till | 190-80-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-15-0 | 55-0-45 | Solid 2-3-6 | 25 ton | Spring Unincorp | 800 ton |
| C4 | 6 | Sorghum-sudan forage<br>Spring Cultivation | Corn silage to small grain cover crop<br>No Till, cover crop no till | 190-0-240 | 0 | 28 | 107-95-195 | 135-95-195 | 0-95-0 | 55-0-45 | 28% UAN (Liquid 28-0-0) 28-0-0 | 10 gal | Fall Unincorp | 60 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 1,200 lb |
| | | | | | | | | | | | Solid 2-3-6 | 25 ton | Spring Unincorp | 150 ton |
| D1 | 58.4 | Alfalfa Seeding Spring<br>Spring vertical tillage | Alfalfa/Brome<br>None | 0-95-275 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-35 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,920 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,920 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 11,680 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 11,680 lb |
| David North | 16 | Alfalfa<br>None | Corn grain<br>No Till | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 0 gal | Summer Unincorp | |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 3,200 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 160,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| David South | 33 | Alfalfa<br>None | Corn grain<br>No Till | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 0 gal | Fall Unincorp | |

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| David South | 33 | Alfalfa<br>None | Corn grain<br>No Till | 190-0-45 | 90 | 0 | 97-80-215 | 187-80-215 | 0-80-170 | 3-0-0 | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 6,600 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 330,000 gal |
| | | | | | | | | | | | legume | | 90-0-0 | |
| EF | 69.2 | Corn silage to small grain cover crop<br>No Till, cover crop no till | Soybeans 30-36 inch row<br>No Till | 0-70-115 | 0 | 22 | 32-27-77 | 54-27-77 | 54-0-0 | 0-43-38 | Diammonium phosphate (DAP) 18-46-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Gypsum 0-0-0 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Potash 0-0-60 | 0 lb | Spring Incorp | |
| | | | | | | | | | | | Liquid 7-6-17 | 4550 gal | Spring Unincorp | 314,860 gal |
| G-1 | 46.6 | Alfalfa/Brome<br>None | Alfalfa/Brome<br>None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 2,330 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 2,330 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Spring Unincorp | 9,320 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 9,320 lb |
| G-2 | 7.3 | Alfalfa/Brome<br>None | Alfalfa/Brome<br>None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 50 lb | Summer Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Spring Unincorp | 365 lb |
| | | | | | | | | | | | Gypsum 0-0-0 | 50 lb | Summer Unincorp | 365 lb |

## *SnapPlus Producer's Plan Report*

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| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G-2 | 7.3 | Alfalfa/Brome None | Alfalfa/Brome None | 0-95-355 | 0 | 0 | 18-46-240 | 18-46-240 | 18-0-0 | 0-49-115 | Potash 0-0-60 | 200 lb | Spring Unincorp | 1,460 lb |
| | | | | | | | | | | | Potash 0-0-60 | 200 lb | Summer Unincorp | 1,460 lb |
| H-1 | 41.8 | Soybeans 30-36 inch row No Till | Corn grain No Till | 130-90-0 | 0 | 0 | 142-80-215 | 142-80-215 | 12-0-215 | 0-10-0 | 28% UAN (Liquid 28-0-0) 28-0-0 | 15 gal | Summer Unincorp | 627 gal |
| | | | | | | | | | | | Corn Starter 15-11-25 | 180 lb | Spring Subsurface | 8,360 lb |
| | | | | | | | | | | | Liquid 7-6-17 | 10000 gal | Spring Unincorp | 418,000 gal |

# WQ1: P Trade Report

| Reported For | Malms Rolling Acres |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2017-01-30 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Mitch Malm\Malm Robert - no till filter strips cover crops.snapDb

**Prepared for:**
Malms Rolling Acres
attn:Mitch and Bob Malm

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

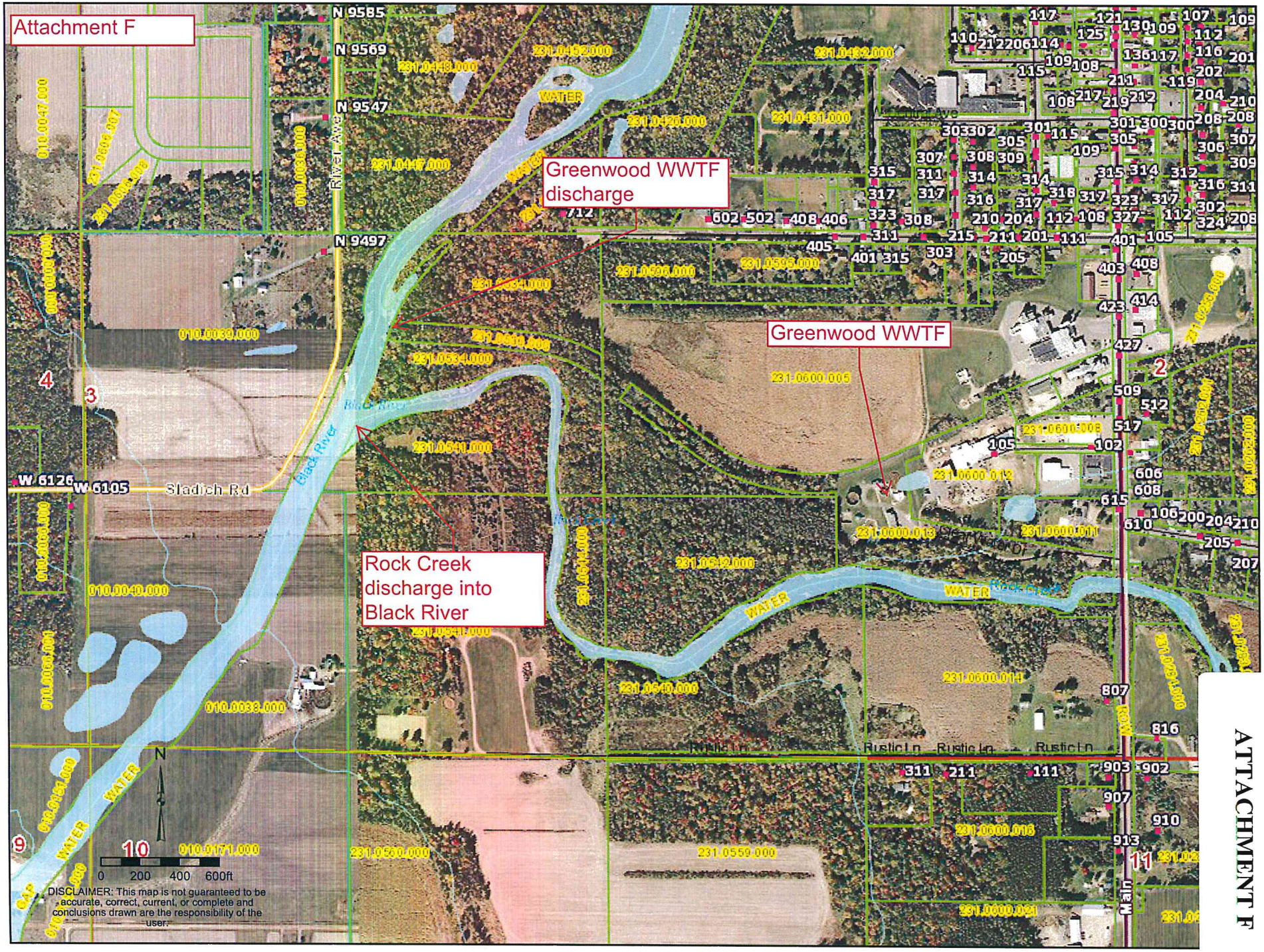
**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| AN | LOYAL | LoB | 20 | 40 | 9 | 40 | 31 | 8 | 35 |
| AS | WITHEE | WeA | 17 | 24 | 6 | 25 | 20 | 5 | 21 |
| BE | LOYAL | LoB | 38 | 27 | 61 | 36 | 59 | 17 | 78 |
| BW1 | LOYAL | LoB | 25 | 45 | 104 | 121 | 34 | 55 | 14 |
| BW2 | LOYAL | LoB | 23 | 55 | 104 | 122 | 35 | 113 | 132 |
| BWN | LOYAL | LoB | 35 | 70 | 160 | 155 | 45 | 72 | 19 |
| C1 | LOYAL | LoB | 21 | 45 | 76 | 26 | 88 | 102 | 30 |

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| C2 | LOYAL | LoB | 17 | 40 | 63 | 18 | 72 | 83 | 24 |
| C3 | LOYAL | LoB | 32 | 34 | 18 | 10 | 9 | 53 | 72 |
| C4 | LOYAL | LoB | 6 | 8 | 5 | 4 | 6 | 28 | 33 |
| D1 | LOYAL | LoB | 58 | 233 | 122 | 46 | 138 | 78 | 52 |
| David North | LOYAL | LoB | 16 | 69 | 37 | 25 | 16 | 9 | 13 |
| David South | LOYAL | LoB | 33 | 116 | 62 | 42 | 25 | 14 | 23 |
| EF | LOYAL | LoB | 69 | 183 | 126 | 79 | 44 | 28 | 29 |
| G-1 | LOYAL | LoB | 47 | 41 | 28 | 117 | 43 | 24 | 13 |
| G-2 | LOYAL | LoB | 7 | 6 | 4 | 18 | 7 | 4 | 2 |
| H-1 | HILES | HeB | 42 | 162 | 42 | 59 | 60 | 70 | 105 |
| **Total** | | | **505** | **1,198** | **1,026** | **944** | **732** | **764** | **693** |




MALM
ATTACHMENT F

**MALM**

**ATTACHMENT G**

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Lonna Klinke | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

## Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ○ Yes ◉ No

| Broker/Exchange Organization Name | Contact Name |
|---|---|
| | |

| Address | Phone Number | Email |
|---|---|---|
| | | |

## Trade Registration Information (Use a separate form for each trade agreement)

| Type | Trade Agreement Number | Practices Used to Generate Credits | Anticipated Load Reduction | Trade Ratio | Method of Quantification |
|---|---|---|---|---|---|
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | | Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips | 1,000 | 1.2:1 | Snap plus |

| County | Closest Receiving Water Name | Land Parcel ID(s) | Parameter(s) being traded |
|---|---|---|---|
| Clark | Black River | see attached maps | Phosphorous |

## The preparer certifies all of the following:

- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Amy Lotham | 8-6-18 |

## Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Lonna Klinke | 8-6-18 |

**Leave Blank -- For Department Use Only**

| Date Received | | Trade Docket Number |
|---|---|---|
| | | |
| Entered in Tracking System ☐ Yes | Date Entered | Name of Department Reviewer |
| | | |

**Larry Gotham**

**To:** Ezra Gotham (egotham@centurytel.net)
**Subject:** FW: Greenwood WQT

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

**From:** Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
**Sent:** Tuesday, September 12, 2017 8:53 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
**Subject:** RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

**From:** Fassbender, Lori - DNR
**Sent:** Monday, September 11, 2017 4:55 PM
**To:** Larry Gotham <lgotham@centurytel.net>
**Cc:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Subject:** RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

**From:** Larry Gotham [mailto:lgotham@centurytel.net]
**Sent:** Friday, March 31, 2017 10:22 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
**Subject:** Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

## Larry Gotham

**From:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Sent:** Friday, February 02, 2018 9:17 AM
**To:** Larry Gotham; Fassbender, Lori - DNR
**Cc:** Ezra Gotham; Hartenbower, Benjamin P - DNR
**Subject:** RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

**From:** Larry Gotham [mailto:lgotham@centurytel.net]
**Sent:** Thursday, February 01, 2018 2:05 PM
**To:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
**Cc:** Ezra Gotham <egotham@centurytel.net>
**Subject:** RE: Greenwood WQT

Hi Pat:
Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.

**Larry Gotham, P.E., R.L.S.**

# Operation, Maintenance & inspection Plan
# Malm Farm
## For Water Quality Trading
## City of Greenwood

The goal of the operation and maintenance plan is to ensure that conservation practices applied on the Malm farm are being operated and maintained properly, to generate the phosphorus credits used by the City of Greenwood WWTF. The filter strips will be operated to maintain a high stem count and stand persistence. The primary purpose of the grass cover is to trap the phosphorus and sediments that leave the farm fields and degrade water quality. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop. No till/reduced tillage and cover crops will be used to increase infiltration of water and lower the amount of sediments carried by runoff to the filter strips.

## Conservation practices requiring Operation Maintenance, and Inspection

### 1. Filter Strips

## Section 1 - Seeding Year

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** will either be as oatlage or as grain and straw. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6" or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6" or after September 1st.

E. **Inspection Frequency** shall be **monthly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist (Clark County) or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

## Section 2 – 2nd Year and beyond

A. **Weed Management,**
   - Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
   - Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edged. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for reduced growth.

B. **Erosion control**. It is unlikely that there will be erosion issues or gully formation after the first year. If erosion becomes evident with monthly inspections, it will be repaired as listed below:
   - Erosion will be filled by tillage or by importing topsoil
   - The area will be seeded with the original grass mix as listed in the water quality trading plan.
   - Erosion mat will be applied to the reseeded area.
   - American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.

C. **Harvesting**. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand, minimum 1 time per year late summer. .
   - The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
   - Frequency of the cutting will be dictated by the regrowth and stand density required.
   - The filter strip should not be harvested after September 1st to allow sufficient re-growth for winter ground cover but not too much cover to restrict spring re-growth.
   - The harvested hay will be removed from the site upon harvest and shall not be stored on the filter strips.

D. **Nutrient Management.** The filter strips should not be fertilized but will be operated to draw down the phosphorus levels in the deposited sediments. This will be done by removing the grass hay crop and not replacing the nutrients as required by soil samples. If the desired species composition and high stand count is not being maintained, a soil sample of the filter strip will be taken to determine if an application of nutrients may be required to maintain the desired species composition and high stand count. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the stand.

E. **Inspection** is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be monthly during the growing season. The following inspection and reporting procedure shall be used:
   - **Monthly Reporting (<u>seeding year</u>) -** Each month the Soil Conservationist or Engineer shall file the report with the City Clerk assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained. This monthly update will also be used to record the following:
     - Harvest dates of filter strips
     - Approximate hay yields to determine nutrient removal rate

- **Quarterly Reporting (<u>second year</u>)** Quarterly reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>third year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Notification of Problems with Grass Filter Strips -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The Farmer and City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

2. **No Till/reduced tillage**. Inspect that the proper tillage practice was followed, according to the Water Quality Trading plan. Inspection shall be reported on the form on page 4. Quarterly reporting shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. The Operator shall make a note on his monthly discharge report (May or June) that No till/reduced tillage was followed according to the Water Quality Trading Plan.
   A. Corn and Soybeans are-No tilled
   B. Sorghum-Sudan Grass (Italian Rye Grass)-Conservation tillage
   C. Alfalfa seeding-Vertical tillage
   D. Corrective tillage to repair damage that would cause further erosion, will cause a credit deduction, see Water Quality Trading Plan.

3. **Cover Crop after Corn Silage** Inspection shall be reported on the form on page 4. Quarterly reporting shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. The Operator shall make a note on his monthly discharge report (September or October) that the cover crop after corn silage was seeded according to the Water Quality Trading Plan.
   A. Refer to Attachment D of the Water Quality Trading plan for installation, Operation and Maintenance of cover crops.
   B. Verify the Cover Crop was seeded with at least 1 Photo fall
   C. Verify in the spring that the cover crop overwintered winter, with at least 1 photo.
   D. If the cover crop fails to over winter, a reduced credit will be taken based upon the percentage of failed cover crop, or an emergency small grain cover crop can be seeded, if the farmer and the City decide to do so. The emergency cover crop will need to be seeded according to Wisconsin Agronomy
   Technical Note 7 (Attachment D)

**WATER QUALITY TRADING INSPECTION FORM**
**MALM FARM**
**CITY OF GREENWOOD**
**LOCATION: SECTION 19, 20, 27, 28, & 29, T.27N. – R.1W.**

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual
Practice compliance (check appropriate box)
No till/reduced tillage ☐
Cover Crop after Corn Silage ☐ Photo taken ☐ Fall/Spring
Filter strip ☐
Summary of findings:

_____
_____
_____
_____
_____

Identification of Items of non-compliance:

_____
_____
_____

Corrective measures required:

_____
_____
_____

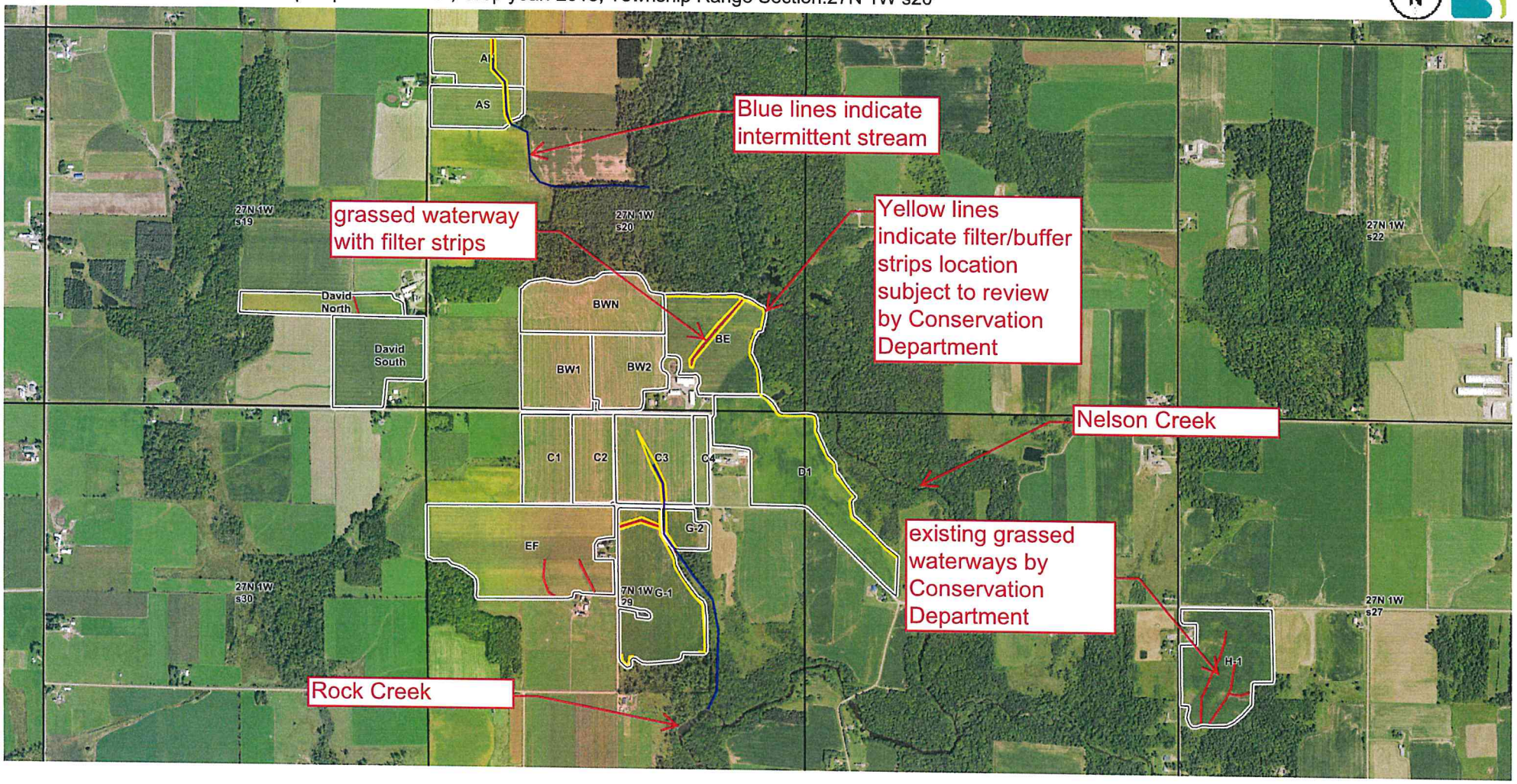
Notice of **non-compliance** to the DNR required: Yes: _____ No: _____
Phosphorus credits used by City (annual report only): _____
Phosphorus credits available (annual report only): _____
Phosphorus credits deductions for failed practice

| Field # | Failed practice & reason | Credit Deduction |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

| FIELD # WHERE PHOTO WAS TAKEN | # OF PHOTOS TAKEN | GENERAL CONDITION OF FIELD |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# Attachment J

Map Generated on:9/11/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:27N 1W s20




- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

ATTACHEMNT J

ATTACHMENT K

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Checklist

Form 3400-208 (1/14)



**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Kayla Schar | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

| Receiving Water Name | Parameter(s) being traded | HUC 12(s) |
|---|---|---|
| Black River | Phosphorus | 070400070405 |

## Credit Generator Information

Credit generator type (select all that apply):

- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant? ◉ Yes; HUC 12: See Attachment A ○ No

Are any of the credit generators downstream of the applicant? ◉ Yes ○ No

Will a broker/exchange be used to facilitate trade? ○ Yes *(include description and contact information in WQT plan)* ◉ No

## Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)

Are each of the point source credit generators identified in this section in compliance with their WDPES permit requirements? ○ Yes ○ No

| Discharge Type | Permit Number | Name | Contact Information | Trade Agreement Number |
|---|---|---|---|---|
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |

**Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.***

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Summary of discharge and existing treatment including optimization | ○ Yes | ○ No | |
| b. Amount of credit being generated | ○ Yes | ○ No | |
| c. Timeline for credits and agreements | ○ Yes | ○ No | |
| d. Method for quantifying credits | ○ Yes | ○ No | |
| e. Tracking and verification procedures | ○ Yes | ○ No | |
| f. Location of credit generator in proximity to receiving water and credit user | ○ Yes | ○ No | |
| g. Other: _____ | ○ Yes | ○ No | |

**Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)**

| Discharge Type | Practices Used to Generate Credits | Method of Quantification | Trade Agreement Number | Have the practice(s) been formally registered? |
|---|---|---|---|---|
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Filter/Buffer strips NoTill/Reduced Tillage | SnapPlus | Section C1 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C2 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C3 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Description of existing land uses | ◉ Yes | ○ No | |
| b. Management practices used to generate credits | ◉ Yes | ○ No | |
| c. Amount of credit being generated | ◉ Yes | ○ No | |
| d. Description of applicable trade ratio per agreement/management practice | ◉ Yes | ○ No | |
| e. Location where credits will be generated | ◉ Yes | ○ No | |
| f. Timeline for credits and agreements | ◉ Yes | ○ No | |
| g. Method for quantifying credits | ◉ Yes | ○ No | |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| h. Tracking procedures | ◉ Yes | ○ No | |
| i. Conditions under which the management practices may be inspected | ◉ Yes | ○ No | |
| j. Reporting requirements should the management practice fail | ◉ Yes | ○ No | |
| k. Operation and maintenance plan for each management practice | ◉ Yes | ○ No | |
| l. Location of credit generator in proximity to receiving water and credit user | ◉ Yes | ○ No | |
| m. Practice registration documents, if available | ◉ Yes | ○ No | |
| n. History of project site(s) | ◉ Yes | ○ No | |
| o. Other: _____ | ○ Yes | ○ No | |

**The preparer certifies all of the following:**

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Tom Fetham | 2·21·19 |

**Authorized Representative Signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Kayla Shaw | 2/22/2019 |

**MALM**
**ATTACHMENT L**

**Certification of Section C1 of The Water Quality Trading Plan**

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schar

Kayla Schar, City Clerk

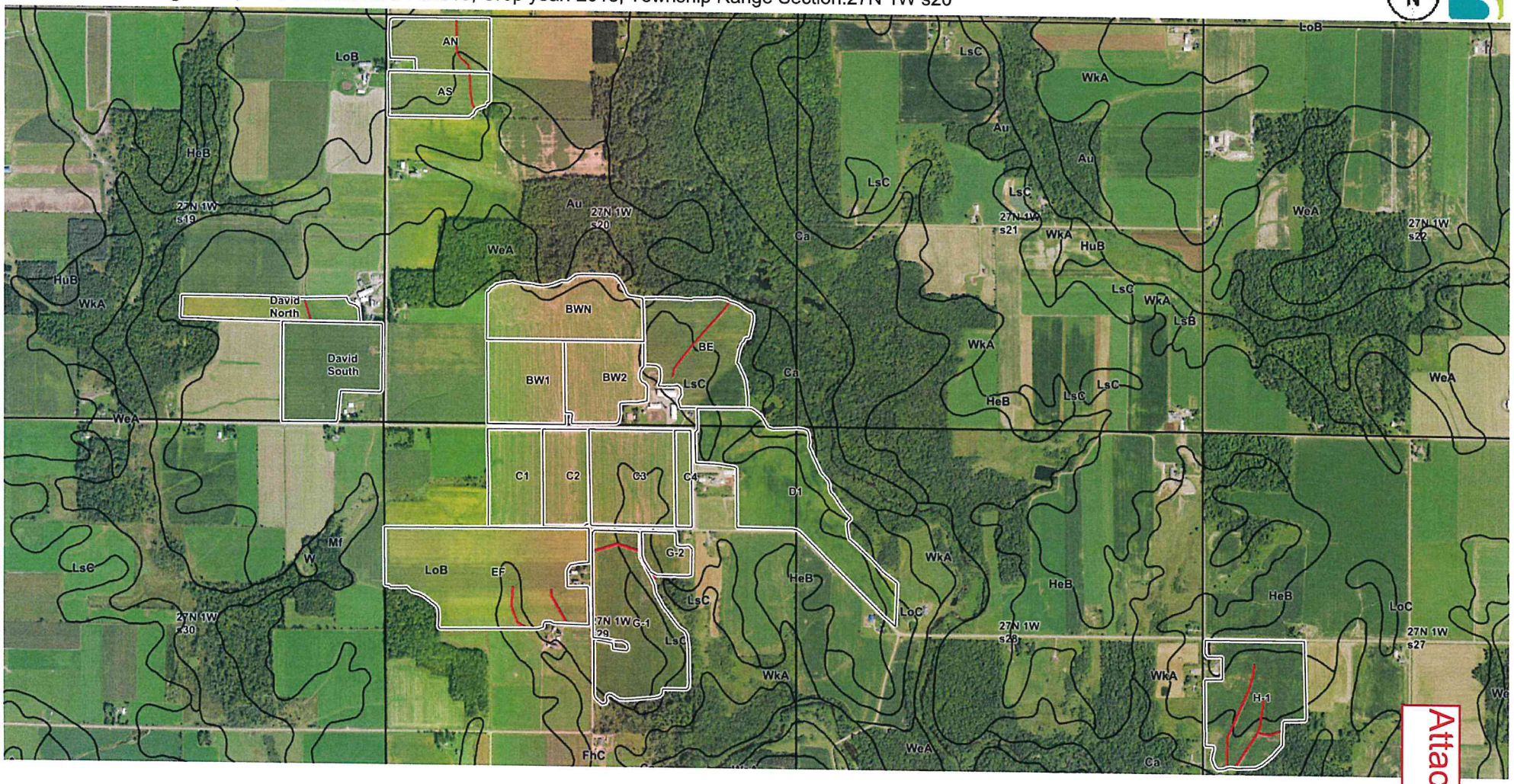
Project Engineer:

Larry Gotham

Larry Gotham P.E., Morgan & Parmley Ltd.

# ATTACHMENT M

Farm: Malms Rolling Acres, V18 Generated:1/14/2019, Crop year: 2018, Township Range Section:27N 1W s20

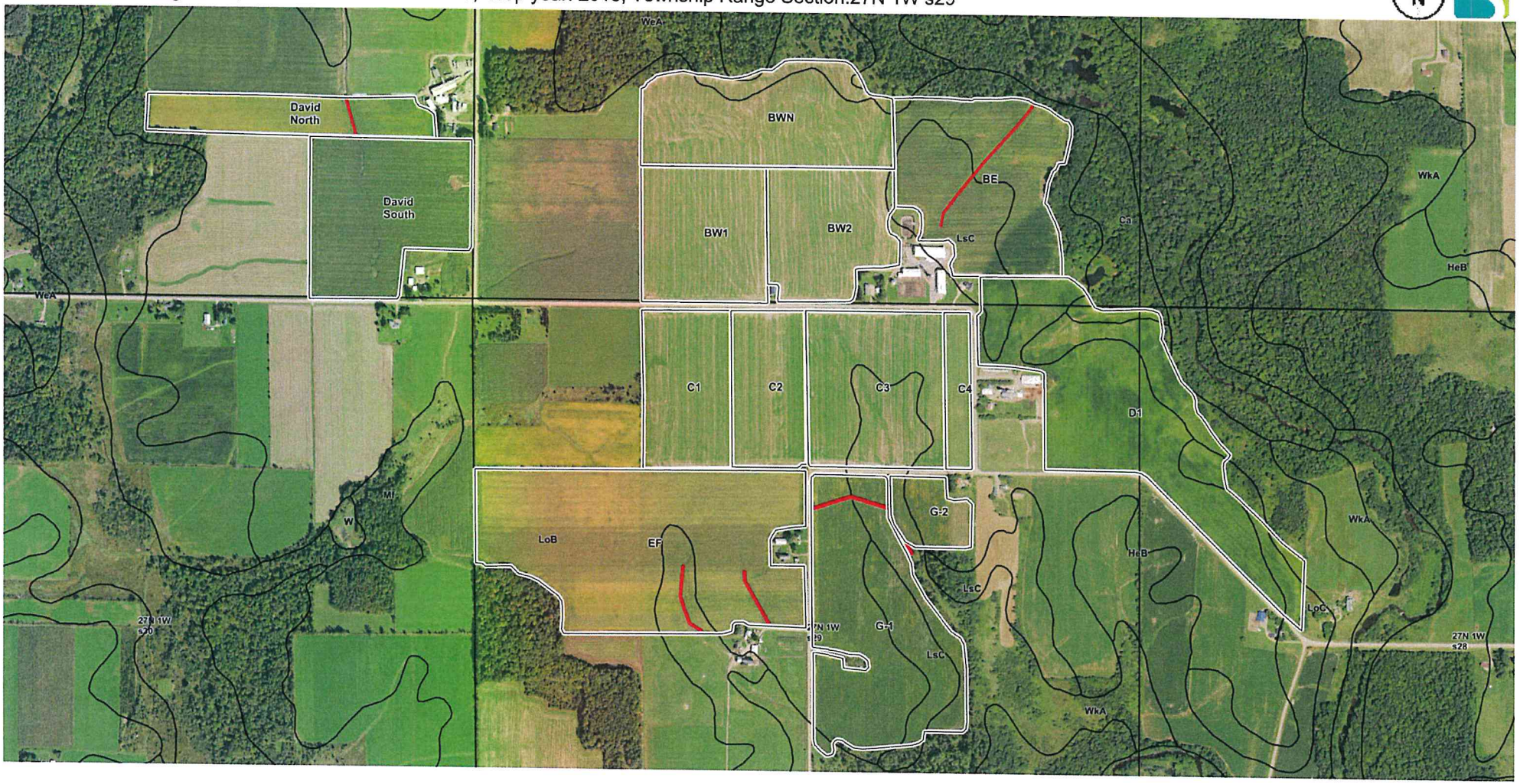



Attachment M

- Counties
- Township/Range
- Soils
- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- Municipal wells
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

# ATTACHMENT M SOIL MAP 1

Farm: Malms Rolling Acres, V18 Generated:1/14/2019, Crop year: 2018, Township Range Section:27N 1W s29




- Counties
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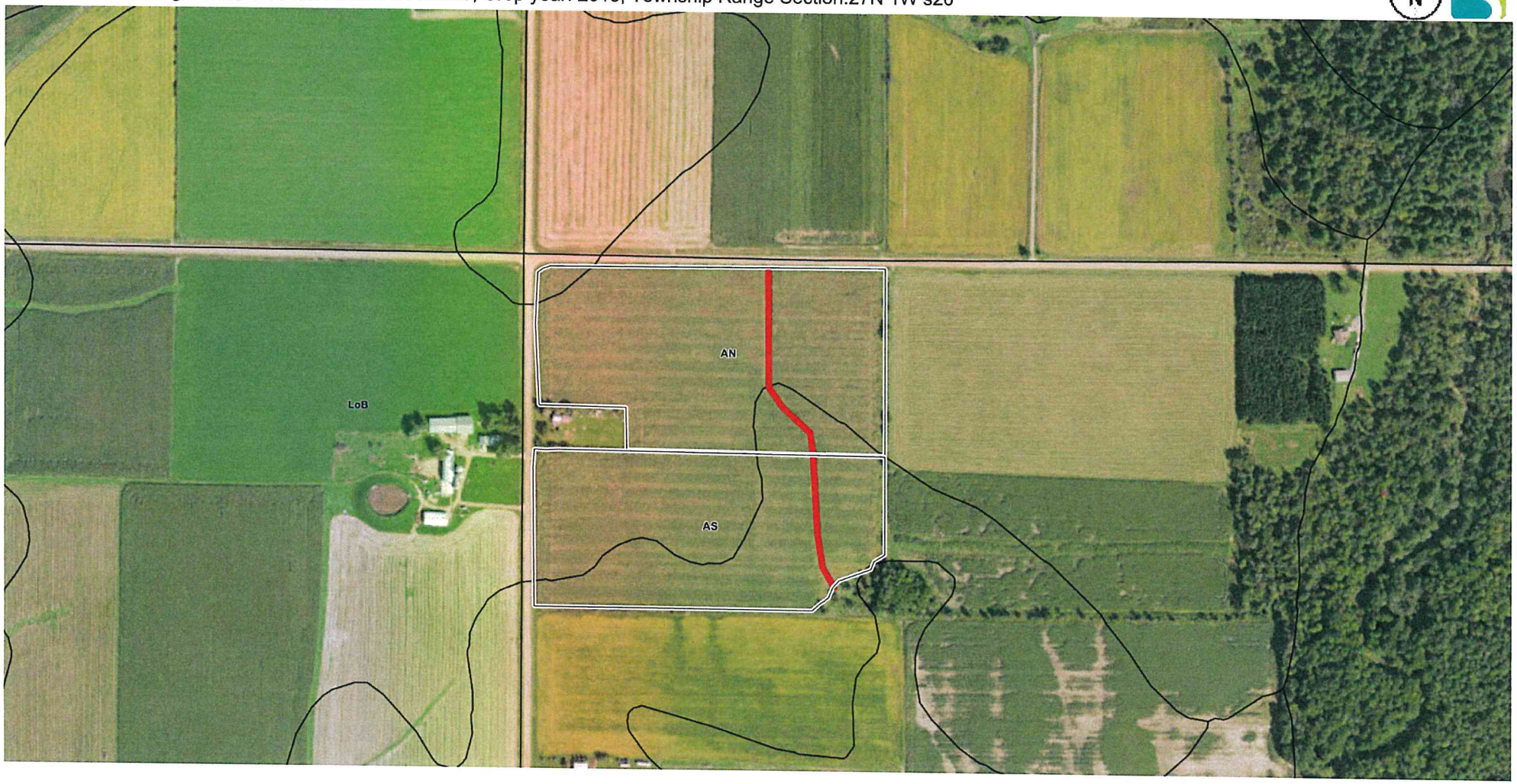
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

# ATTACHMENT M SOIL MAP 2

Farm: Malms Rolling Acres, V18 Generated:1/14/2019, Crop year: 2018, Township Range Section:27N 1W s20




- Counties
- Township/Range
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- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
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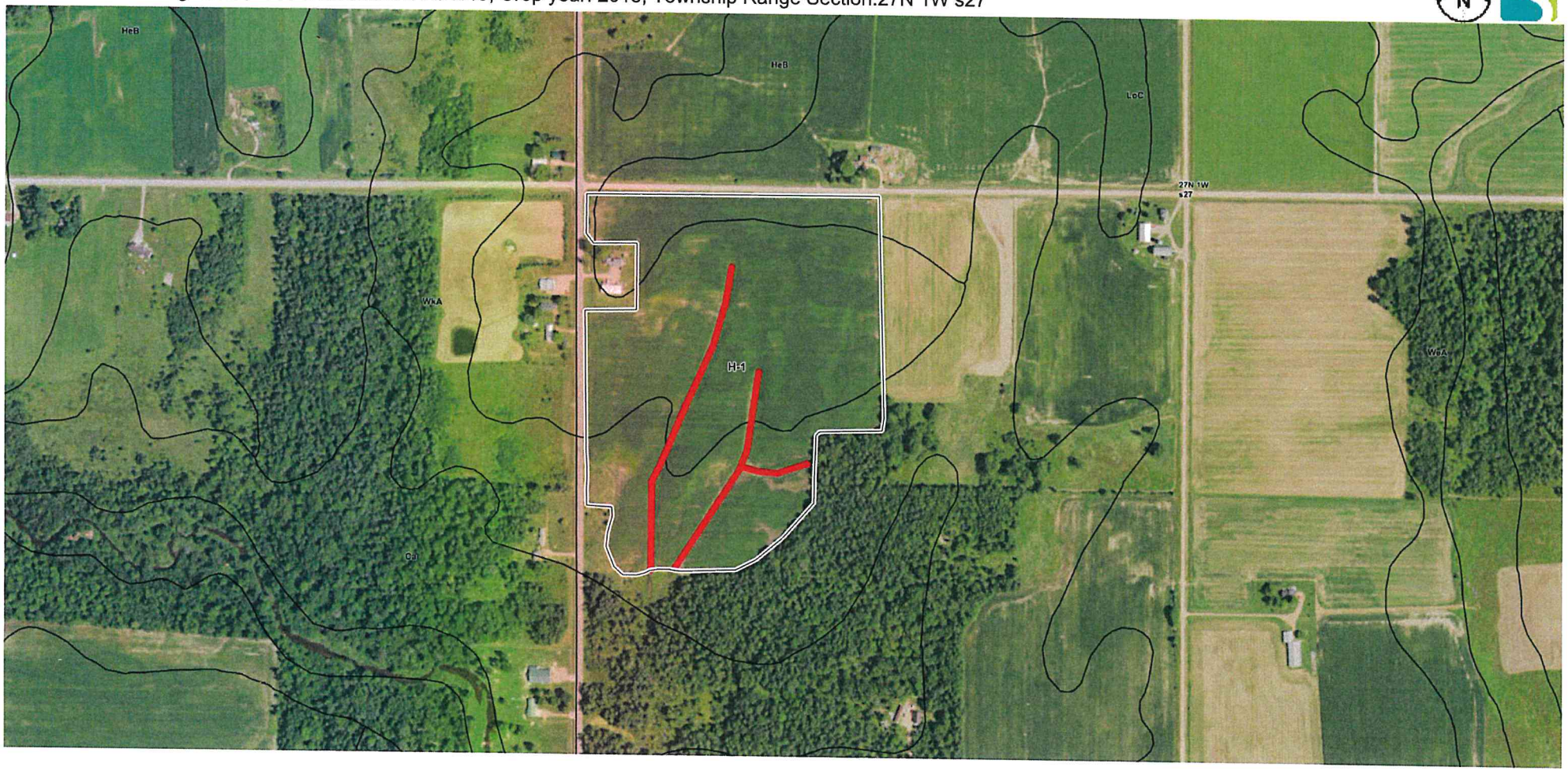
- Municipal wells
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

# ATTACHMENT M SOIL MAP 3

Farm: Malms Rolling Acres, V18 Generated:1/14/2019, Crop year: 2018, Township Range Section:27N 1W s27




- Counties
- Township/Range
- Soils
- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
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- Sinkhole/other karst feature
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- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

ATTACHMENT N

| | |
|---|---|
| Wisconsin Department of Agriculture, Trade & Consumer Protection<br>Division of Agricultural Resource Management<br>Bureau of Land and Water Resources<br>PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605 | **Nutrient Management Plan Checklist** |
| Sec. 92.05(3)(k), Wis. Stats.<br>ATCP 50.04(3) Wis. Admin. Code | Use this form to check nutrient management (NM) plans for compliance with the WI NRCS 590 Standard (Sept. 2005). |

County name: Clark Date Plan Submitted: 12/19/17 Growing season year NM plan is written for 2018 (from harvest to harvest)
Township (T. 27 N) – (R. 1 W ) Initial Plan or Updated Plan (choose one)

| | | |
|---|---|---|
| Name of qualified nutrient management planner<br>Josh Johnson | | Planner's business name, address, phone:<br>Northside Elevator, Inc. Loyal, WI 715-255-8507 |
| Circle the planner's qualification:<br>1. NAICC-CPCC<br>2. ASA-CCA<br>3. ASA-Professional Agronomist<br>4. SSSA-Soil Scientist<br>5. DATCP approved training course<br>6. Other credentials approved by DATCP | Cropland Acres (owned & rented)<br>505 | Name of farm operator receiving nutrient management plan:<br>Malms Rolling Acres |
| | Rented farm(s) landowner name(s) and acreage:<br>49 acres David Hursh | |

Check relevant program requirement/regulation plan developed for: Ordinance USDA DATCP DNR NR 243 – NOD or WPDES

| | | Yes | No | NA |
|---|---|---|---|---|
| **1.** | **Are the following field features identified on maps or aerial photos in the plan? Maps on file** | | | |
| a. | Field location, soil survey map unit(s), field boundary, acres and field identification number | X | | |
| b. | Areas prohibited from receiving nutrient applications: Surface water, established concentrated flow channels with perennial cover, permanent non-harvested vegetative buffer, non-farmed wetlands, sinkholes, lands where established vegetation is not removed, nonmetallic mines, and fields eroding at a rate exceeding tolerable soil loss (T) | X | | |
| c. | Areas within 50 feet of a potable drinking water well where mechanically-applied manure is prohibited | X | | |
| d. | Areas prohibited from receiving winter nutrient applications: Slopes > 9% (12% if contour-cropped); Surface Water Quality Management Area (SWQMA) defined as land within 1,000 ft of lakes and ponds or within 300 ft of perennial streams draining to these waters, unless manure is deposited through winter gleaning/pasturing of plant residue and not exceeding the N and P requirements of this standard; Additional areas identified within a conservation plan as contributing runoff to surface or groundwater | X | | |
| e. | Areas where winter applications are restricted unless effectively incorporated within 72 hours: Land contributing runoff within 200 feet upslope of direct conduits to groundwater such as a well, sinkhole, fractured bedrock at the surface, tile inlet, or nonmetallic mine | X | | |
| f. | Sites vulnerable to N leaching: Areas within 1,000 feet of a municipal well, and soils listed in Appendix 1 of the Conservation Planning Technical Note WI-1 | X | | |
| **2.** | **Are erosion controls implemented so the crop rotation will not exceed T on fields that receive nutrients according to the conservation plan or WI P Index model?** | X | | |
| **3.** | **Were soil samples collected and analyzed within the last 4 years according to UW Publication A2100 recommendations? See Farm Narrative** | X | | |
| **4.** | **Using the field's predominant soil series and realistic yield goals, are planned nutrient application rates, timing, and methods of all forms of N, P, and K listed in the plan and consistent with UW Publication A 2809,** *Soil Test Recommendations for Field, Vegetable and Fruit Crops,* **and the 590 standard?** | X | | |
| **5.** | **Do manure production and collection estimates correspond to the acreage needed in the plan? Are manure application rates realistic for the calibrated equipment used?** | X | | |
| **6.** | **Is a single phosphorus (P) assessment of either the P Index or soil test P management strategy uniformly applied to all fields within a tract? Snap Plus** | X | | |
| **7.** | **Are areas of concentrated flow, resulting in reoccurring gullies, planned to be protected with perennial vegetative cover?** | X | | |
| **8.** | **Will nutrient applications on non-frozen soil within the SWQMA comply with the following?** | | | |
| a. | Unincorporated liquid manure on unsaturated soils will be applied according to Table 1 of the 590 standard to minimize runoff **all manure is incorporated** | X | | |
| b. | One or more of the following practices will be used: 1) Install/maintain permanent vegetative buffers, or 2) Maintain greater than 30% crop residue or vegetative coverage on the surface after nutrient application, or 3) Incorporate nutrients leaving adequate residue to meet tolerable soil loss, or 4) Establish fall cover crops promptly following application | X | | |

I certify that the nutrient management plan represented by this checklist complies with Wisconsin's NRCS 590 nutrient management standard.
*Signature of qualified nutrient management planner*

# C-2 Trading Partner Plan: Wayne Riethmiller

## C-2 TRADING PARTNER: WAYNE RIETHMILLER

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**REITHMILLER FARM ATTACHMENTS:**

A. HUC 12 Map

B. Riethmiller Farm Map

C. SnapPlus Reports, Existing Conditions

D. Farm Location Map

E. SnapPlus Reports, Proposed Conditions

F. Riethmiller Farm Discharge Point

G. Management Practice Registration Form

H. DNR Trade Ratio Calculation

I. Operation and Maintenance Manual

J. No Field Edge Filter

K. Water Quality Trading Checklist

L. Certification of Section C-2 of the Water Quality Trading Plan

M. Verification of Cropping and use of Moldboard by County Conservationist

N. Photos of Moldboard plow used by Riethmiller

O. Soils Map

Attachment
C-2 **TRADING PARTNER: WAYNE RIETHMILLER**

**A. EXECUTIVE SUMMARY:**

The field we are proposing to use as a Phosphorus trade is on the home farm of Wayne Riethmiller. His home farm consists of 80 acres where he milked 25 cows and housed the accompanying young stock. Wayne owns additional 270± acres in Section 17 & 18 (see Attachment D, area marked in orange is operated by Wayne). He has crops on approximately 30 acres of that farm, the remainder is rented to a neighbor (and historically has been). We will not be generating credit on any portion of the other farm, because the portion Wayne has control over is in HUC 070400070501.

The 20± acre field selected for this trade is located on the home farm in Section 8 and is being converted from corn silage, using moldboard plowing, to a conservation easement in perennial vegetation, harvested for hay. The credit will be generated through perennial vegetation which reduces tillage. Credit will also be generated by no longer spreading manure in the winter. Wayne has just sold his dairy herd so he will no longer have dairy manure to spread on a daily basis. The field in the trade was previously reserved for spreading in the winter, when the weather was too inclement to spread on fields in Section 17 (see orange highlighted area on attachment D). The 20± acre field has a direct discharge into a drainage ditch which meanders to the Black River, and also falls within a SWQMA which prohibits winter spreading.

The 20± acre field will generate on average, from 2018 thru 2023, approximately 183 lb. of potentially tradable phosphorus. The proposed trade ratio to be applied will have an Uncertainty Factor 1:1, Equivalency Factor N/A, Downstream Trading Factor of 1.1:1. The proposed minimum trade ratio is 1.2:1 (Tradeable Phosphorus of 183±/1.2 = 153±) see table 4 for year by year credit generation.

**B. LOCATION OF AGRICULTURAL PROPERTY**: The field we are proposing for this trade is located in the same HUC 12, but downstream of the Greenwood WWTF Outfall. Runoff from this field discharges into the Black River approximately 2600' downstream of the WWTF Outfall, via an intermittent stream. The field is located in the N ½ of the SW ¼ of Section 8, T26N-R2W, Town of Eaton, and Clark County. Attachment A shows the drainage area's HUC 12 map and Attachment B shows the aerial view of the farm and the location of the HUC 12 dividing line.

**C. EXISTING OPERATION:** Wayne Riethmiller owns 350± acres, 90 acres of which he farms, the remainder of the tillable land is rented to a neighbor. The farm has been home to a milking herd of 25 cows plus associated dry cows, young stock and steers. Manure from the dairy herd is randomly applied to the crop land without the benefit of a nutrient management plan. The primary crop grown is grass hay and corn silage.

**D. SOIL SAMPLING:** Soil samples for the farm are outdated; the last results for the field in the trade are from 1998. Soil samples for the field in the trade were collected in accordance with UWEX Publication A2100. All soil samples are tested by the UW lab in Marshfield. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged to create a single recommendation for that field. See Attachment C for results.

**E. CROPLAND:** There are 90 acres farmed by Wayne, only 20± of those tillable acres will be included in this trade. The 20± acre field Wayne 1, will be converted from silage production to permanent grass hay. The converted acres have been in corn silage for the last 2 years.

F. **SnapPlus - MODELING:** The SnapPlus file used to generate the existing conditions of the field in this trade were generated from notes taken during a conversation with Wayne and also the site visit to take soil samples.

1. **Previous 2 Years of Cropping History:** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and cropping history from Wayne were made for 2016 and 2017. Both confirmed that the field was corn the past 2 years.
2. **Current Conditions To Be Projected:** The nutrient applications, cropping and tillage data from 2016 and 2017 will be projected out to 2023.
3. **Tillage:** The field within this trade was moldboard plowed in 2016 and chisel plowed in 2017.
4. **Rotation:** For the purposes of this WQT plan the rotation of 2016 Corn Silage and 2017 Corn Silage will be project to 2023 as continuous Corn Silage.
5. **Credit Generation:** The Phosphorus Credits that we will be claiming will be generated through, a perennial vegetative cover with a conservation easement. Perennial vegetation (hay) works to reduce Phosphorus runoff by trapping particulate Phosphorus, and also by no longer tilling the field which increases Phosphorus in runoff. Credit will also be generated by no longer spreading manure in the winter. Wayne has just sold his dairy herd so he will no longer have dairy manure to spread on a daily basis.
6. **Nutrients:** Manure was spread on a daily basis. Fields located in Section 17 (see Attachment D) received roughly 70 percent of the manure. The field in the trade received roughly 30 percent of the manure and was reserved for spreading in the winter when the weather was too inclement to spread on fields in section 17.

G. **NUTRIENTS FROM MANURE:** The farm, on average, has milked 25 cows and had 5 dry cows. For purposes of calculation, all cows will weigh 1400 pounds. Future replacement animals 5 calves up to 250 lb., and 15 heifers' average weight 1000 lb. Lactating cows and calves to 250 lb., 100% manure collected as solid. Heifers and Dry cows 75% of manure collected as solid. Using UW Extension guidelines:

- 1400 lb. Dairy Cow produces 148± lb. of manure per. day
- 1400 lb. Dry Cow produces 115± lb. of manure per. day
- 250 lb. Dairy Calf produces 21 ± lb. of manure per day
- 1000 lb. Heifer produces 82± lb. of manure per day
- [(365 days x 148 lb. x 25/2000 lb.) + (365 days x 115 lb. x 5/2000 lb. x 75%) + (365 days x 21 lb. x 5/2000 lb.) + (365 days x 82 lb. x 15/2000 lb. x 75%)]. = 980 Ton.

H. **CROP PRODUCTION:** Existing Corn Production: The following nutrient application data is the standard for the corn crop. See Attachment C for specific field application data. The yield goal is 10-15 ton silage. Starter fertilizer and manure were applied to the corn crop in 2016 with no additional Nitrogen sources. Manure was the only nutrient application made to the corn crop in 2017.

- Commercial starter fertilizer 200 lb. per acre of 19-19-19 (2016 only)
- 15± Ton. of manure, total analysis per acre using UW recommendations 30-45-90, 2nd year nitrogen credit not taken.
- Theoretical total application to the crop 58-83-130 pounds per acre, not including any N credits, (2016 only)
- Theoretical crop removal in silage 140-65-145 pounds per acre (N requirement varies based upon soil and MRTN price ratio)

## I. POTENTIALLY TRADEABLE PHOSPHORUS UNDER CURRENT MANAGEMENT:

SnapPlus Modeling was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model the fields under projected current management practices. The current management: crops and nutrient applications will be modeled out to 2023 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The following Attachments were generated through the modeling process. Attachment C includes the following SnapPlus reports:

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

**TABLE 1 – Wayne Riethmiller Existing Conditions**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 |
|---|---|---|---|---|---|---|---|---|---|
| Wayne Riethmiller | wayne 1 | FLAMBEAU | FhB | 20.4 | 230 | 182 | 236 | 185 | 270 |
| **Total** | | | | **20.4** | **230** | **182** | **236** | **185** | **270** |

## J. CREDIT GENERATION - PROPOSED OPERATING CONDITONS OF THE FIELD:

After the Water Quality Trading Plan has been approved by the DNR and accepted by the City of Greenwood, the farm will install or implement the conservation practices listed in the following section. The City and Wayne Riethmiller will enter into an agreement to maintain the conservation practices. The agricultural land will be used to generate Phosphorus Credits through reduction of tillage, installing perennial vegetation (hay), and no longer spreading manure in the winter.

1. **Nutrient Management.** Wayne 1, the field in this trade, tests high in Phosphorus and will be operated to draw down the Phosphorus level. This will be done by withholding nutrient applications and removing crops without replacing the Phosphorus. Phosphorus will be drawn down to the optimum level on the soil test, before Phosphorus containing fertilizers will be applied.
2. **Soil Sampling.** Soil sampling will be conducted on a 4 year schedule to monitor the nutrients. The soil tests will be used to prescribe the proper fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section and the sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW lab in Marshfield. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension A2809.
3. **Cropping.** The field will be seeded to alfalfa/grass with an oat nurse crop in May of 2018; 2019 to the termination of the contract the field will remain in grass hay.
4. **Tillage:** The field will be prepared for planting by moldboard plowing with subsequent passes of a disc. The field will not be tilled again for the term of the contract unless, to repair a greater erosion risk.

5. **Seeding:**
   - **Soil preparation.** The field will be moldboard plowed to incorporate residue of the previous crop, and disked/cultivated to prepare a smooth seedbed.
   - **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

| | |
|---|---|
| 30% | Alfalfa |
| 20% | Fawn Tall Forage Fescue |
| 20% | Timothy |
| 30% | Brome Grass |

   - **Nurse Crop.** 1 ½ bushel per acre of oats or equivalent nurse crop will be seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment. Oats are a cool season annual grass that will provide ground cover. Nurse crop will be taken off as grain at maturity.
   - **Seed Placement.** Seed will be sown using either a grain drill or by a Brillion type seeder. Upon final seed placement a single pass may be made with a large smooth drum roller.
   - **Harvest.** As appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

K. **CREDIT ADJUSTMENT FOR PROPOSED ACTION:** The remainder of the property containing field Wayne 1 has been in hay for an extended period (as indicated in CropScape since 2009) and will need to be reseeded. The farmer plans to reseed the remainder of the property in 5 acre increments, progressing to the west. To prepare the field for reseeding, each strip will be seeded to corn for a minimum of 1 year. Then seeded back into hay, therefore this process will negate a portion of the credit generated from field Wayne 1. SnapPlus was used to model one of these 5 acre strips, designated as field Wayne 2, to generate the Potentially Tradeable Phosphorus, which will then be deducted from the credit generated by field Wayne-1 on an annual basis. In summary the farm will be generating credit by reducing corn acres from 20± acres to only 15±.

1. **SnapPlus - Modeling:**
   - Previous 2 years grass hay
   - The field is modeled with a grassed filter strip to reduce the impact of reseeding. A buffer strip is maintained along West Eaton Rd and the first 30' of field Wayne 1. The filter strip along Wayne 1 will not be fully functioning in 2018, so 2018 will be modeled with no buffer strip.
   - 2018: Corn silage was modeled as a worst case scenario. The field was mold board plowed and disked to prepare a seedbed. Commercial fertilizer 200 lb. of 19-19-19 starter fertilizer was applied, consistent with past practice no additional nitrogen was applied.
   - 2019: Corn silage modeled as a worst case scenario. The field was chisel plowed and disked to prepare a seedbed. Commercial fertilizer 200 lb. of 19-19-19 starter fertilizer was applied, consistent with past practice, no additional nitrogen was applied.

- 2020: The field will be seeded back down to hay with a nurse crop of oats. The field is moldboard plowed and disked to prepare a seedbed, and seeded with a drill or brillion.
- 2022-2023, Alfalfa grass hay is established and harvested as hay.
- See Attachment J for SnapPlus map and reports
  - Producers Plan report
  - P Trade Report
  - Map of modeled strip

**TABLE 2 – 5 ac. RESEEDING**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Wayne Riethmiller | wayne 2 | FLAMBEAU | FhB | 5.0 | 12 | 6 | 4 | 2 | 2 | 2 |
| **Total** | | | | **5** | **12** | **6** | **4** | **2** | **2** | **2** |

2. **<u>Credit Deduction</u>:** The first strip would be seeded back into hay in 2020 and the next strip seeded to corn in 2020 to continue the process. For the credit deduction we will add the deduction, for 2019 which would be 2nd year corn to year 2020 which is the seeding year for hay, by doing this we can simulate the transition year going from one strip to another. This will simulate 5 acres being seeded back into hay and the next strip being seeded to corn.
3. **<u>Credit Deduction Schedule</u>:**
   - 2018, 12 lb.
   - 2019, 6 lb. + 4 lb. =10 lb. to simulate reseeding the strip back into hay early.
   - 2020, 6 lb. +4 lb.=10 lb. the planned year to seed the first strip back to hay and rotate the next strip to corn.
   - 2021, 6 lb. +4 lb. =10 lb. to simulate reseeding the strip back into hay early.
   - 2022, 6 lb. +4 lb. =10 lb. the planned year to seed the 2nd strip back to hay and rotate the next strip to corn.
   - 2023, 6 lb. +4 lb. =10 lb. to simulate reseeding the strip back into hay early.

**L. POTENTIALLY TRADEABLE PHOSPHORUS:** Will be generated through a Conservation Easement which generates credit though a reduction of tillage and perennial vegetation (hay), which provides year round ground cover and phosphorus trapping abilities. The other practice that will generate PTP credit will be no longer spread manure in the winter. The farm has sold its dairy herd so the need to spread manure daily is has been removed. The following SnapPlus reports will be included in Attachment E to document the proposed operating conditions of field Wayne 1.

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Manure Tracking Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorus Trade Report

**TABLE 3 – PTP Perennial Vegetation – Phosphorus Runoff**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| wayne riethmiller | wayne 1 | FLAMBEAU | FhB | 20.4 | 110 | 11 | 10 | 7 | 5 | 4 |
| **Total** | | | | **20.4** | **110** | **11** | **10** | **7** | **5** | **4** |

**M. PHOSPHORUS TRADE RATIOS:** The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratio. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices. Following are the trade ratio factors:

- **Delivery -** N/A Credit generator and user within same HUC 12
- **Downstream –** 1.1:1 The runoff from this field discharges into the Black River approximately 2600' downstream of the WWTF Outfall, via an intermittent stream See Attachment F
- **Equivalency -** N/A for Phosphorus
- **Uncertainty –** Conservation Easement, perennial vegetation for the term of the contract. 1:1 per. Table 16, Pg. 57 of A WQT How To Manual WI DNR,
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Wayne Riethmiller and the City of Greenwood WWTF**.

**N. REPORTING:**

**(REFER TO ATTACHMENT I – OPERATION AND MAINTENANCE PLAN)**

**O. PHOSPHORUS CREDIT GENERATION:** Credits are calculated as the difference between phosphorus lost under current baseline practices and phosphorus lost under the proposed practices. The credits are calculated on an annual basis. The table below shows the trade rates per year beginning in 2018 and extending to 2023. Credits will be available in 2018 upon successful establishment of perennial vegetation (hay).

**TABLE 4: TRADEABLE PHOSPHORUS**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Past Practices PTP | wayne 1 | FLAMBEAU | FhB | 20.4 | 230 | 182 | 236 | 185 | 270 | 210 |
| Perennial Vegetation PTP | wayne 1 | FLAMBEAU | FhB | 20.4 | 110 | 11 | 10 | 7 | 5 | 4 |
| | | | | | 120 | 171 | 226 | 178 | 265 | 206 |
| PTP Credit Deduction From Reseeding | wayne 2 | FLAMBEAU | FhB | 5.0 | 12 | 10 | 10 | 10 | 10 | 10 |
| **Total PTP** | | | | **20.4** | **108** | **161** | **216** | **168** | **255** | **196** |
| **Total Credits w/1.2:1 trade ratio** | | | | **20.4** | **90** | **134** | **180** | **140** | **212** | **163** |

**<u>Tradeable phosphorus in years 2024 and beyond will be based upon the 2023 Total Tradeable Phosphorus of 163 pounds per year.</u>**

**P. MANAGEMENT PRACTICE REGISTRATION:** Submit the following to the DNR to register that the management practices have been installed (2018):

- Date of contract
- Management Practice Registration form Attachment F
- Date corrective measures have been completed
- Date of seeding filter strips
- Date of 90% ground cover and photo verification
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season

1. **Monthly Reporting:** Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**

2. **Annual Reporting**: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:
   - Verification that site inspection has occurred
   - Brief summary of site inspection findings
   - Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
   - At least 1 photo of the perennial vegetation, indicating condition
   - A summary of credits used each month over the calendar year
3. **Notification of Problems That Affect Credit Generation:** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT plan. The City will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

**Q. DNR RIGHT OF ENTRY:** The Wayne Riethmiller grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

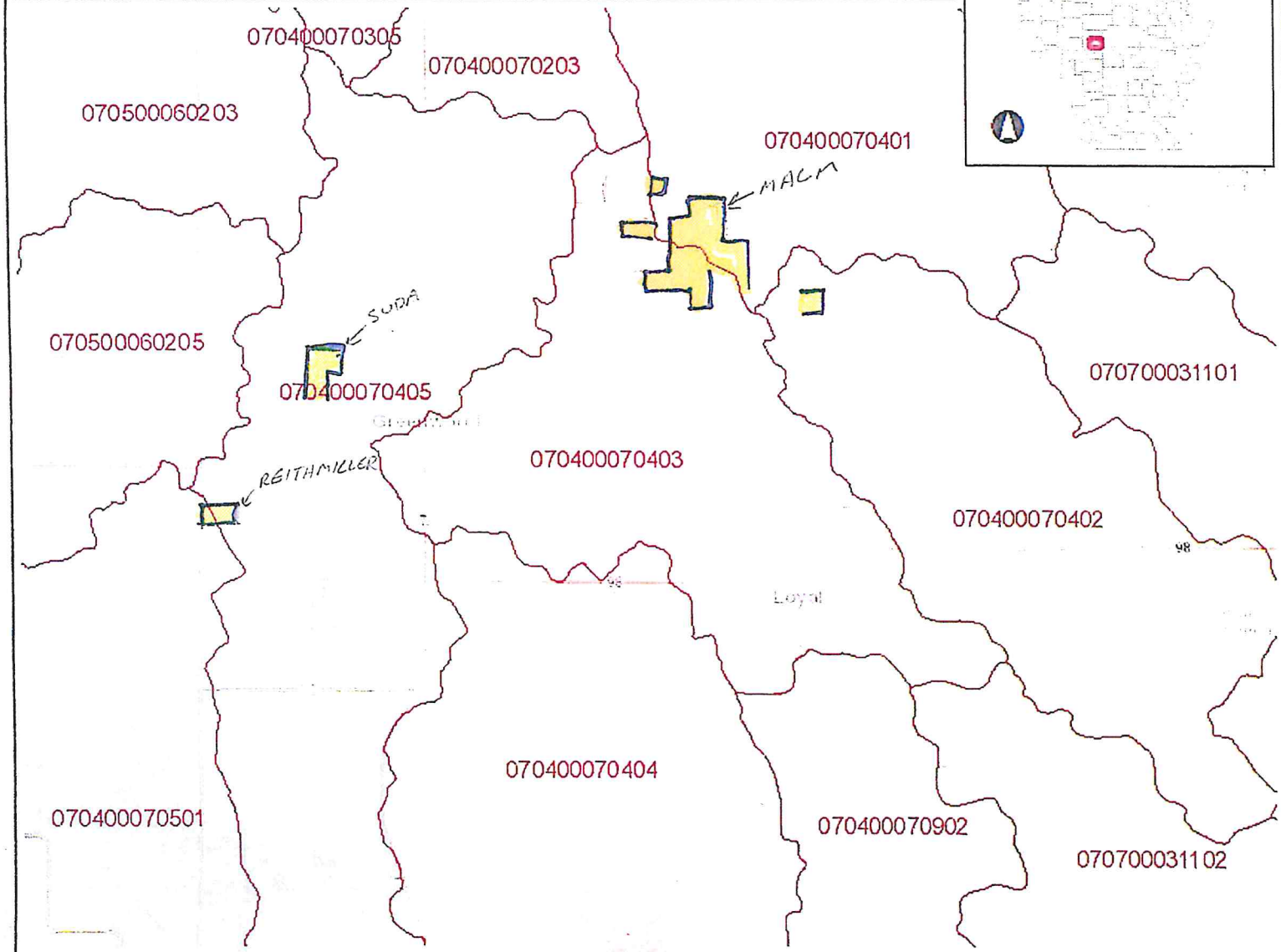
**R. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST**

This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 8, page 37 of Guidance for Implementing Water Quality Trading Plans, Guidance No: 3800-2013-04; Form 3400-208 is included as Attachment J. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit". Below are listed the checklist questions, **bold and underlined**, with the answers following.

- **Permittee's/credit user's WPDES permit number**: No. WI 020249-09
- **Permittee's/credit users contact information:** Lonna Klinke, City Clerk<br>102 N. Main Street<br>Greenwood WI 54437<br>Phone 715-267-6205
- **Pollutant for which credit will be generated:** Phosphorus

| | |
|---|---|
| • **Amount of Credits available from each location, management practice, local government unit when acting as broker:** | See Table 4, page 6 |
| • **Certification that the content of the trading application is accurate and correct.** | See Section S, page 8 |
| • **Signature and date of signature of permittee's/ credit users authorized representative:** | See Section S, page 8 |
| • **Location where credits will be generated:** | See Attachment A and B |
| • **Identification of methods including management practices that will be used to generate credits:** | See Section J, page 3 |
| • **Duration of agreement with each credit generator:** | 5 years with the provision of extension, unless WPDES removes the phosphorus requirement |
| • **Schedule for installation/construction of each management practice:** | See Section J-3, page 3 |
| • **Operation and Maintenance plan for each management practice,** | See Attachment I |
| • **Date when credits become available for each management practice:** | See Section O |
| • **Models used to derive the amount of credits:** | SnapPlus, see Attachment C & E |
| • **The applicable trade ratio for each management practice including supporting technical basis:** | See section M, page 5 & 6 |

# Surface Water Data Viewer Map




**Legend**

- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

**Notes**

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

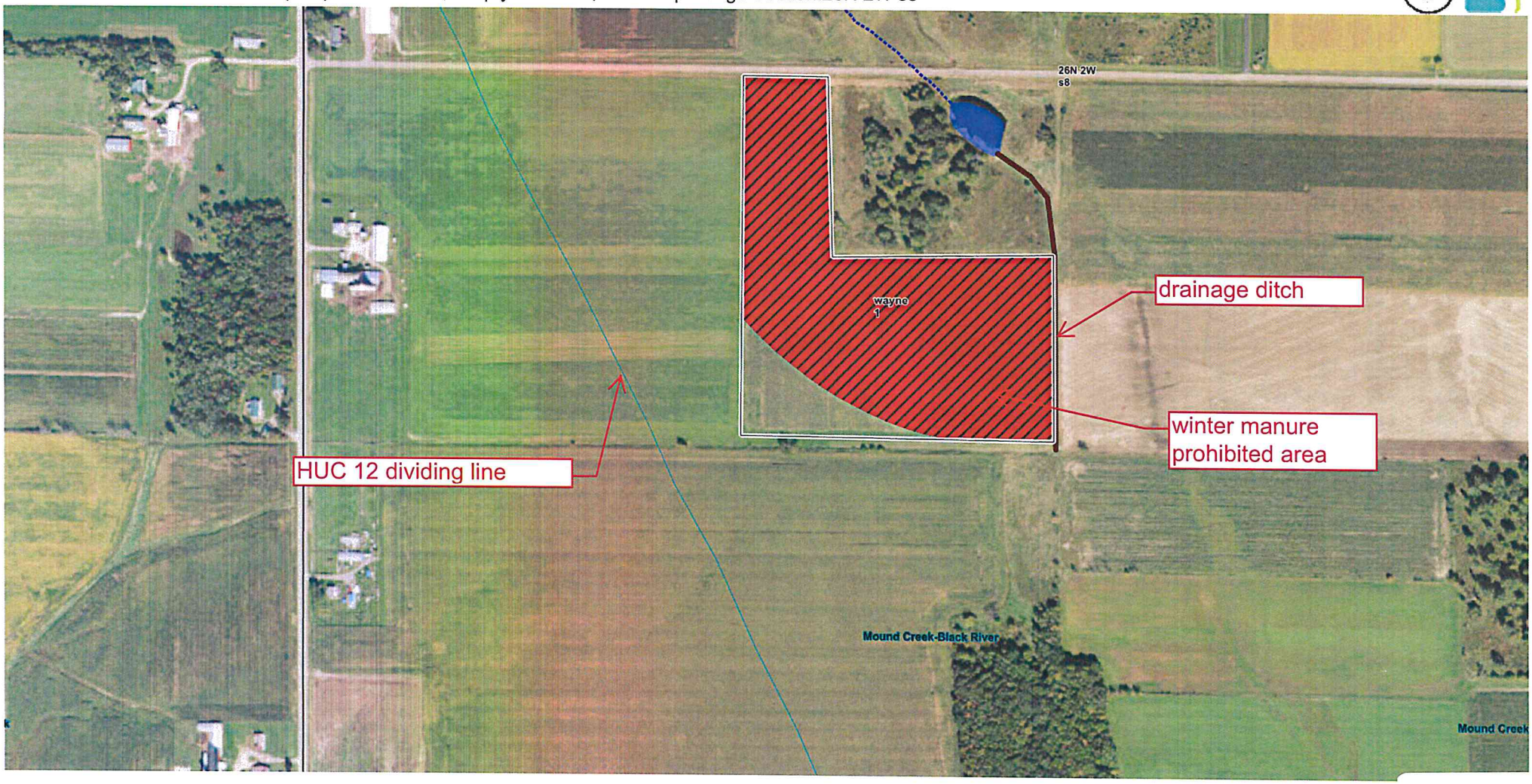
1: 126,720

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

RIETHMILLER
ATTACHMENT A

# Attachment B

Map Generated on:8/1/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s8




- Feb/Mar liquid manure prohibited areas
- Perennial Streams
- Intermittent Streams
- Waterbodies
- HUC 12 Watershed
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Winter manure prohibited areas
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

RIETHMILLER
ATTACHMENT B

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

**Farm** has 1 fields totalling 20.4 acres
**Farm Narrative:** None

**Annual Farm Notes:**

No Annual Farm Notes

**Spreader Calibration Methods:** No spreader calibration rate documentation has been selected.

**Narrative and Crops:**

| Field Name | Acres | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow 10-15 | Corn silage Spring Chisel, disked 10-15 | Corn silage Spring MB Plow 10-15 | Corn silage Spring Chisel, disked 10-15 | Corn silage Spring MB Plow 10-15 | Corn silage Spring Chisel, disked 10-15 | Corn silage Spring MB Plow 10-15 | Corn silage Spring Chisel, disked 10-15 |

**Summary by Crop:**
**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

| Crops Grouped By Category | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Corn silage | Acres | 20<br>250 | 20<br>250 | 20<br>250 | 20<br>250 | 20<br>250 | 20<br>250 | 20<br>250 | 20<br>250 |

RIETHMILLER
ATTACHMENT C

# FM6: Soil Test Report

| Reported For | Wayne Riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| wayne 1 | | 20.4 | FhB | FLAMBEAU | 2018-04-30 | Soil & Forage Analysis Lab | 2075 | **4** | **5** | 6.6 | 3.2 | 39 | 89 | 0 | 0 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| wayne 1 | 2018-04-30 | | | | | X | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Analysis Date | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 |
| | Dry Matter (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dairy Solid | Production (Tons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Tons) | 306 | 306 | 306 | 306 | 306 | 306 | 306 |
| | Analysis Date | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Application Results Reported For Farm All

| Source | | 2023 |
|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 |
| | Used (Gallons) | 0 |
| | Analysis Date | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 |
| | Dry Matter (%) | 2 |
| | Total Value | 0.00 |
| Dairy Solid | Production (Tons) | 0 |
| | Used (Tons) | 306 |
| | Analysis Date | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 |
| | Dry Matter (%) | 33 |
| | Total Value | 0.00 |

## Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 918 | 918 | 918 | 918 | 918 | 918 | 918 |
| | P2O5 | 918 | 918 | 918 | 918 | 918 | 918 | 918 |
| | K2O | 1,836 | 1,836 | 1,836 | 1,836 | 1,836 | 1,836 | 1,836 |
| Total Fertilizer Nutrients Applied (lb) | N | 775 | 0 | 775 | 0 | 775 | 0 | 775 |
| | P2O5 | 775 | 0 | 775 | 0 | 775 | 0 | 775 |
| | K2O | 816 | 0 | 816 | 0 | 816 | 0 | 816 |
| Total Crop Removal (lb) | P2O5 | 918 | 918 | 918 | 918 | 918 | 918 | 918 |
| | K2O | 2,142 | 2,142 | 2,142 | 2,142 | 2,142 | 2,142 | 2,142 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | 775 | 0 | 775 | 0 | 775 | 0 | 775 |
| | K2O | 510 | -306 | 510 | -306 | 510 | -306 | 510 |

## Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2023 |
|---|---|---|
| Produced from Manure (lb) | Ninj | 0 |
| | P2O5 | 0 |
| | K2O | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 918 |
| | P2O5 | 918 |
| | K2O | 1,836 |
| Total Fertilizer Nutrients Applied (lb) | N | 775 |
| | P2O5 | 775 |
| | K2O | 816 |
| Total Crop Removal (lb) | P2O5 | 918 |
| | K2O | 2,142 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | 775 |
| | K2O | 510 |

# NM4: Manure Tracking Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

| Acres/ CropYear | 2016 | 2017 | 2018 |
|---|---|---|---|
| Acres in plan | 20.4 | 20.4 | 20.4 |
| Acres receiving manure | 20.4 | 20.4 | 20.4 |

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 | 0 | 0 |
| | Used (Gallons) | 0 | 0 | 0 |
| | Analysis Date | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 |
| | Dry Matter (%) | 2 | 2 | 2 |
| | Total Value | 0.00 | 0.00 | 0.00 |
| Dairy Solid | Production (Tons) | 0 | 0 | 0 |
| | Used (Tons) | 306 | 306 | 306 |
| | Analysis Date | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 |

## Estimated Livestock Manure Production For 2018

| Animal Type | Subfarm | Barn | # of Animals | Total No. Of Days | % Collected As Solid | % Collected As Liquid | Yearly Tons | Yearly Gallons |
|---|---|---|---|---|---|---|---|---|
| Dairy Lactating Cows 1400 lbs | | wayne | 25 | 365 | 100 | 0 | 675 | 0 |
| Dairy Calf 250 lbs | | wayne | 5 | 365 | 100 | 0 | 19 | 0 |
| Dairy Youngstock 500 lbs | | wayne | 5 | 365 | 100 | 0 | 38 | 0 |
| Dairy Heifer 1000 lbs | | wayne | 15 | 365 | 75 | 0 | 168 | 0 |
| Dairy Dry Cows 1400 lbs | | wayne | 5 | 365 | 75 | 0 | 79 | 0 |
| | | | | | | **Farm Totals** | 979 | 0 |

## Manure Storage For 2018

No Storages Found

## Spreaders For 2018

No Spreaders Found

# NM3: Field Data and 590 Assessment Plan

| Reported For | Wayne Riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | | | | 20.4 | Clark | FLAMBE AU FhB | 4 | 350 | 0 - 2 | 301 - 1000 | W | No / No | No | No | Csl | SP | 2016-2016 | 5 | 7.4 | -0.3 | 12 | 39 | 38 | - |

### Crop Abbreviations

| Abbreviation | Crop |
|---|---|
| Csl | Corn silage |

### Tillage Abbreviations

| Abbreviation | Tillage |
|---|---|
| SP | Spring MB Plow |

**Restriction Legend**

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2016** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2015 Crop and Tillage | 2016 Crop and Tillage | Adjusted Crop Need lb/ac | 2016 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | missing | Corn silage Spring MB Plow | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Subsurface | 4,200 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2017** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2016 Crop and Tillage | 2017 Crop and Tillage | Adjusted Crop Need lb/ac | 2017 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-160 | 0 | 0 | 30-45-90 | 30-45-90 | 0-45-0 | 160-0-70 | 19-19-20 (19-19-20) 19-19-20 | 0 lb | Spring Unincorp | |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring Chisel, disked | Corn silage Spring MB Plow | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Subsurface | 4,080 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-160 | 0 | 0 | 30-45-90 | 30-45-90 | 0-45-0 | 160-0-70 | 19-19-20 (19-19-20) 19-19-20 | 0 lb | Spring Subsurface | |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage<br>Spring Chisel, disked | Corn silage<br>Spring MB Plow | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20)<br>19-19-20 | 200 lb | Spring Subsurface | 4,080 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-160 | 0 | 0 | 30-45-90 | 30-45-90 | 0-45-0 | 160-0-70 | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring Chisel, disked | Corn silage Spring MB Plow | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Unincorp | 4,080 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Unincorp | 4,080 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# WQ1: P Trade Report

| Reported For | Wayne Riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage .snapDb

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

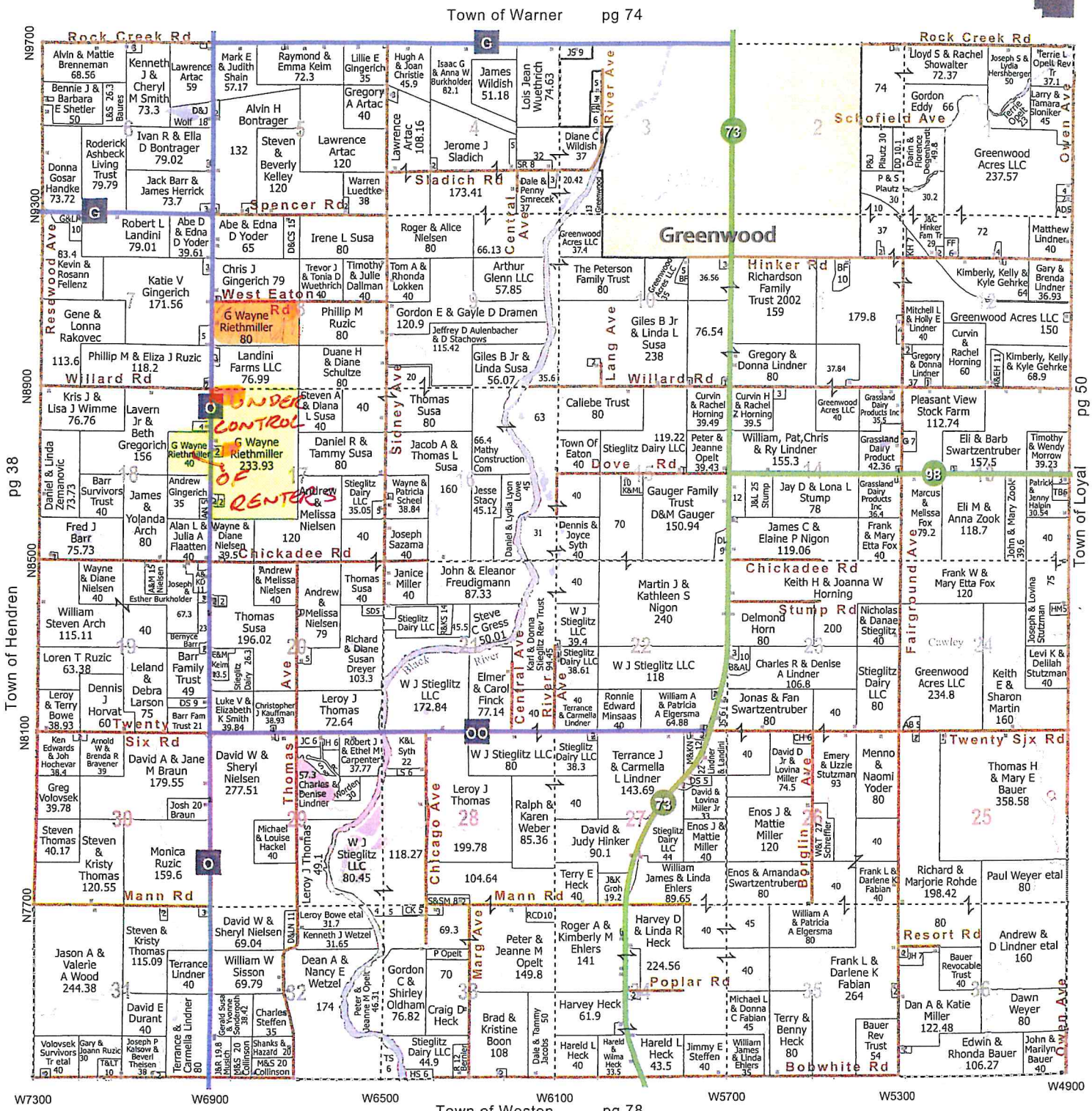
| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| wayne 1 | FLAMBEAU | FhB | 20 | 230 | 182 | 236 | 185 | 270 | 210 |
| **Total** | | | **20** | **230** | **182** | **236** | **185** | **270** | **210** |

**RIETHMILLER**

**ATTACHMENT D**

# TOWN OF EATON

**T26N R2W**





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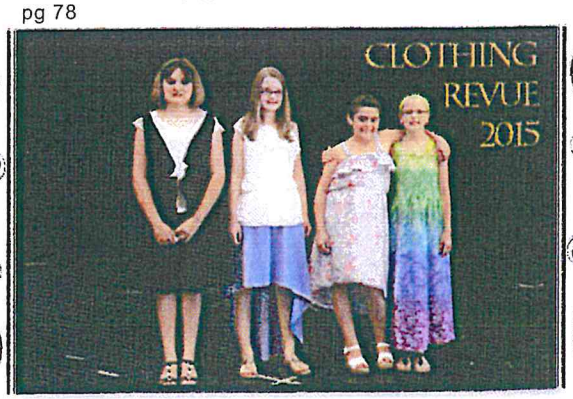

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

**Farm** has 1 fields totalling 20.4 acres
**Farm Narrative:** None

**Annual Farm Notes:**

No Annual Farm Notes

**Spreader Calibration Methods:** No spreader calibration rate documentation has been selected.

**Narrative and Crops:**

| Field Name | Acres | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage<br>Spring MB Plow<br>10-15 | Corn silage<br>Spring Chisel, disked<br>10-15 | Oats w/ Alfalfa/Brome<br>Seeding Spring<br>Spring MB Plow<br>30-60 | Alfalfa/Brome<br>None<br>2.6-3.5 | Alfalfa/Brome<br>None<br>2.6-3.5 | Alfalfa/Brome<br>None<br>2.6-3.5 | Alfalfa/Brome<br>None<br>2.6-3.5 | Alfalfa/Brome<br>None<br>2.6-3.5 |

**Summary by Crop:**
**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

| Crops Grouped By Category | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Alfalfa/Brome | Acres | | | | 20<br>61 | 20<br>61 | 20<br>61 | 20<br>61 | 20<br>61 |
| Corn silage | Acres | 20<br>250 | 20<br>250 | | | | | | |

RIETHMILLER
ATTACHMENT E

| Crops Grouped By Category | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Oats w/ Alfalfa/Brome Seeding Spring | Acres | | | 20<br>900 | | | | | |

# FM6: Soil Test Report

| Reported For | wayne riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| wayne 1 | | 20.4 | FhB | FLAMBEAU | 2018-04-30 | Soil & Forage Analysis Lab | 2075 | **4** | **5** | 6.6 | 3.2 | 39 | 89 | 0 | 0 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| wayne 1 | 2018-04-30 | | | | | X | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Analysis Date | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 |
| | Dry Matter (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dairy Solid | Production (Tons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Tons) | 306 | 306 | 306 | 0 | 0 | 0 | 0 |
| | Analysis Date | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Application Results Reported For Farm All

| Source | | 2023 |
|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 |
| | Used (Gallons) | 0 |
| | Analysis Date | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 |
| | Dry Matter (%) | 2 |
| | Total Value | 0.00 |
| Dairy Solid | Production (Tons) | 0 |
| | Used (Tons) | 0 |
| | Analysis Date | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 |
| | Dry Matter (%) | 33 |
| | Total Value | 0.00 |

## Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 918 | 918 | 918 | 0 | 0 | 0 | 0 |
| | P2O5 | 918 | 918 | 918 | 0 | 0 | 0 | 0 |
| | K2O | 1,836 | 1,836 | 1,836 | 0 | 0 | 0 | 0 |
| Total Fertilizer Nutrients Applied (lb) | N | 775 | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 775 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 816 | 0 | 0 | 2,489 | 2,489 | 2,489 | 2,489 |
| Total Crop Removal (lb) | P2O5 | 918 | 918 | 1,122 | 816 | 816 | 816 | 816 |
| | K2O | 2,142 | 2,142 | 4,284 | 3,672 | 3,672 | 3,672 | 3,672 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | 775 | 0 | -204 | -816 | -816 | -816 | -816 |
| | K2O | 510 | -306 | -2,448 | -1,183 | -1,183 | -1,183 | -1,183 |

## Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2023 |
|---|---|---|
| Produced from Manure (lb) | Ninj | 0 |
| | P2O5 | 0 |
| | K2O | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 0 |
| | P2O5 | 0 |
| | K2O | 0 |
| Total Fertilizer Nutrients Applied (lb) | N | 0 |
| | P2O5 | 0 |
| | K2O | 2,489 |
| Total Crop Removal (lb) | P2O5 | 816 |
| | K2O | 3,672 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | -816 |
| | K2O | -1,183 |

# NM4: Manure Tracking Report

| | |
|---|---|
| **Starting Year** | **2016** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date:** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

| Acres/ CropYear | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|
| Acres in plan | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 | 20.4 |
| Acres receiving manure | 20.4 | 20.4 | 20.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source | | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Dairy Liquid | Production (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Gallons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Analysis Date | - | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 | 4/6/7-3-11 |
| | Dry Matter (%) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dairy Solid | Production (Tons) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Used (Tons) | 306 | 306 | 306 | 0 | 0 | 0 | 0 | 0 |
| | Analysis Date | - | - | - | - | - | - | - | - |
| | Analysis (N/Ninc/Ninj-P2O5-K2O) | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 | 2/3/3-3-6 |
| | Dry Matter (%) | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | Total Value | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## Estimated Livestock Manure Production For 2018

| Animal Type | Subfarm | Barn | # of Animals | Total No. Of Days | % Collected As Solid | % Collected As Liquid | Yearly Tons | Yearly Gallons |
|---|---|---|---|---|---|---|---|---|
| Dairy Lactating Cows 1400 lbs | | wayne | 25 | 365 | 100 | 0 | 675 | 0 |
| Dairy Calf 250 lbs | | wayne | 5 | 365 | 100 | 0 | 19 | 0 |
| Dairy Youngstock 500 lbs | | wayne | 5 | 365 | 100 | 0 | 38 | 0 |
| Dairy Heifer 1000 lbs | | wayne | 15 | 365 | 75 | 0 | 168 | 0 |
| Dairy Dry Cows 1400 lbs | | wayne | 5 | 365 | 75 | 0 | 79 | 0 |
| | | | | | | **Farm Totals** | 979 | 0 |

## Manure Storage For 2018

**No Storages Found**

## Spreaders For 2018

**No Spreaders Found**

# NM3: Field Data and 590 Assessment Plan

| | |
|---|---|
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | | | | 20.4 | Clark | FLAMBEAU FhB | 4 | 350 | 0 - 2 | 301 - 1000 | W | No / No | No | No | OgABs-AB-AB-AB-AB-AB | SP-None-None-None-None-None | 2018-2023 | **5** | **0.2** | **1.1** | **1** | 39 | -210 | - |

### Crop Abbreviations

| Abbreviation | Crop |
|---|---|
| AB | Alfalfa/Brome |
| OgABs | Oats w/ Alfalfa/Brome Seeding Spring |

### Tillage Abbreviations

| Abbreviation | Tillage |
|---|---|
| None | None |
| SP | Spring MB Plow |

**Restriction Legend**

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2016** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2015 Crop and Tillage | 2016 Crop and Tillage | Adjusted Crop Need lb/ac | 2016 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | missing | Corn silage Spring MB Plow | 190-0-160 | 0 | 0 | 68-83-130 | 68-83-130 | 0-83-0 | 122-0-30 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Subsurface | 4,080 lb |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2017** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2016 Crop and Tillage | 2017 Crop and Tillage | Adjusted Crop Need lb/ac | 2017 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-160 | 0 | 0 | 30-45-90 | 30-45-90 | 0-45-0 | 160-0-70 | 19-19-20 (19-19-20) 19-19-20 | 0 lb | Spring Unincorp | |
| | | | | | | | | | | | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Corn silage Spring Chisel, disked | Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow | 20-0-310 | 0 | 0 | 30-45-90 | 30-45-90 | 10-45-0 | 0-0-220 | Dairy Solid 2-3-6 | 15 ton | Winter Unincorp | 306 ton |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb**

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow | Alfalfa/Brome None | 0-0-235 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-113 | Potassium chloride 0-0-61 | 200 lb | Spring Unincorp | 4,080 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb**

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-235 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-113 | Potassium chloride 0-0-61 | 200 lb | Summer Unincorp | 4,080 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb**

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-235 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-113 | Potassium chloride 0-0-61 | 200 lb | Summer Unincorp | 4,080 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb**

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-235 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-113 | Potassium chloride 0-0-61 | 200 lb | Summer Incorp | 4,080 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **wayne riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb**

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

## Field Data: 20.4 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 1 | 20.4 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-235 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-113 | Potassium chloride 0-0-61 | 200 lb | Summer Unincorp | 4,080 lb |

# WQ1: P Trade Report

| Reported For | wayne riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller hay - Copy.snapDb

**Prepared for:**
wayne riethmiller
attn:Wayne Reithmiller

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

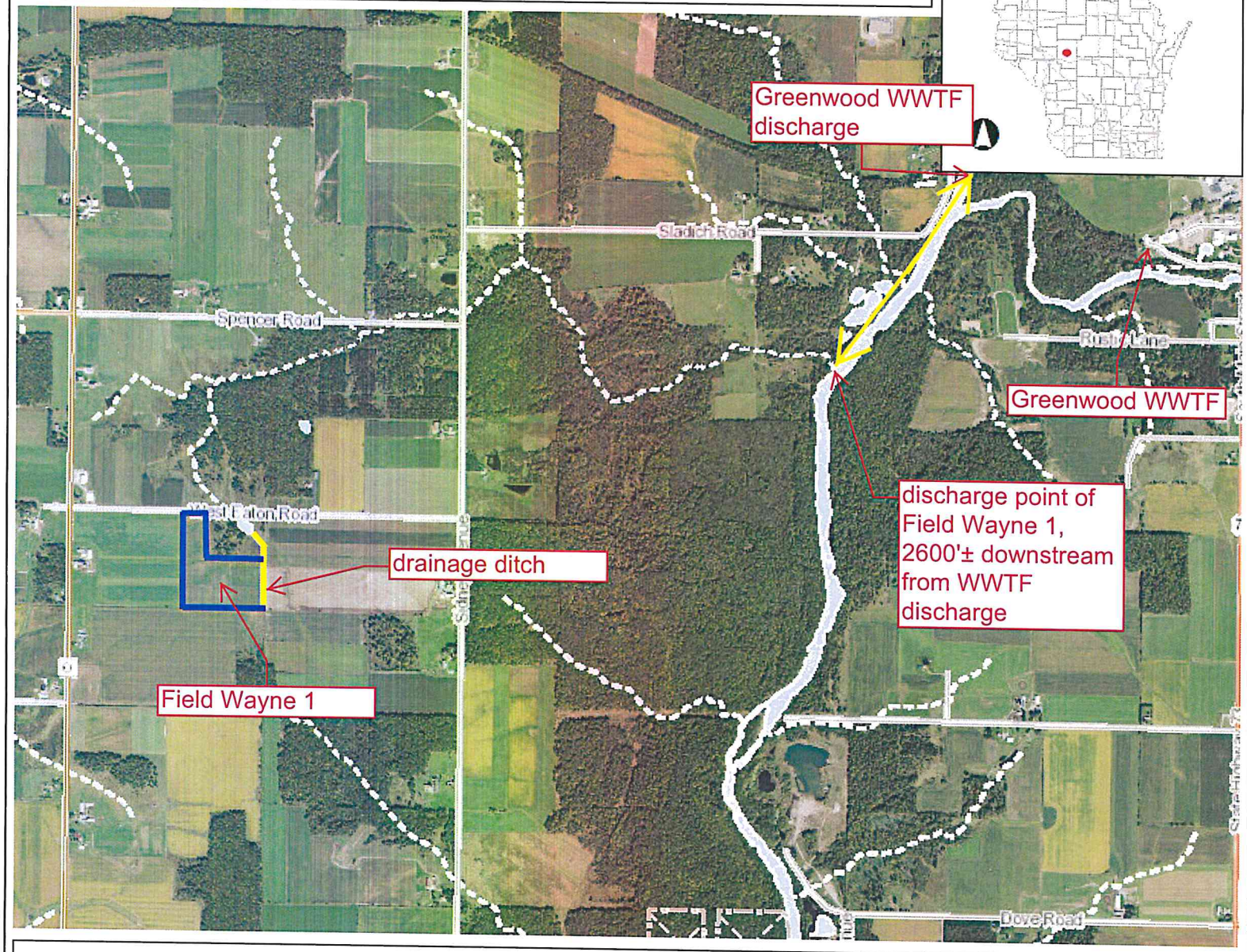
**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| wayne 1 | FLAMBEAU | FhB | 20 | 110 | 11 | 10 | 7 | 5 | 4 |
| **Total** | | | **20** | **110** | **11** | **10** | **7** | **5** | **4** |

# Attachment F




**Legend**

- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

0.8 0 0.38 0.8 Miles

NAD_1983_HARN_Wisconsin_TM

1: 23,760

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

**Notes**

RIETHMILLER
ATTACHMENT F

**RIETHMILLER**

**ATTACHMENT G**

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Lonna Klinke | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

## Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ○ Yes ◉ No

| Broker/Exchange Organization Name | Contact Name | |
|---|---|---|
| Address | Phone Number | Email |

## Trade Registration Information (Use a separate form for each trade agreement)

| Type | Trade Agreement Number | Practices Used to Generate Credits | Anticipated Load Reduction | Trade Ratio | Method of Quantification |
|---|---|---|---|---|---|
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | | Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips | 1,000 | 1.2:1 | Snap plus |

| County | Closest Receiving Water Name | Land Parcel ID(s) | Parameter(s) being traded |
|---|---|---|---|
| Clark | Black River | see attached maps | Phosphorous |

## The preparer certifies all of the following:

- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Amy Lotham | 8-6-18 |

## Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Lonna Klinke | 8-6-18 |

**Leave Blank -- For Department Use Only**

| Date Received | | Trade Docket Number |
|---|---|---|
| Entered in Tracking System ☐ Yes | Date Entered | Name of Department Reviewer |

**Larry Gotham**

**To:** Ezra Gotham (egotham@centurytel.net)
**Subject:** FW: Greenwood WQT

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

**From:** Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
**Sent:** Tuesday, September 12, 2017 8:53 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
**Subject:** RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

**From:** Fassbender, Lori - DNR
**Sent:** Monday, September 11, 2017 4:55 PM
**To:** Larry Gotham <lgotham@centurytel.net>
**Cc:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Subject:** RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

**From:** Larry Gotham [mailto:lgotham@centurytel.net]
**Sent:** Friday, March 31, 2017 10:22 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
**Subject:** Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

## Larry Gotham

**From:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Sent:** Friday, February 02, 2018 9:17 AM
**To:** Larry Gotham; Fassbender, Lori - DNR
**Cc:** Ezra Gotham; Hartenbower, Benjamin P - DNR
**Subject:** RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

> **From:** Larry Gotham [mailto:lgotham@centurytel.net]
> **Sent:** Thursday, February 01, 2018 2:05 PM
> **To:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
> **Cc:** Ezra Gotham <egotham@centurytel.net>
> **Subject:** RE: Greenwood WQT
>
> Hi Pat:
> Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.
>
> **Larry Gotham, P.E., R.L.S.**

# Operation, Maintenance & inspection Plan
# Field Wayne 1, Wayne Riethmiller Farm
For Water Quality Trading
City of Greenwood

The goal of the operation and maintenance plan is to ensure that the perennial grass cover will persist. The primary purpose of the grass cover is to reduce the phosphorus and sediments that leave the farm and degrade water quality on the Black River. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop.

## Section 1 - Seeding Year 2018

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** will either be as oatlage or as grain and straw. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6" or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6" or after September 1st.

E. **Inspection Frequency** shall be **monthly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

## Section 2 - 2019 and beyond

1. **Weed Management**,
    - Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
    - Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edge. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for soil erosion.
2. **Erosion control**. It is unlikely that there will be erosion issues or gully formation after the first year; the site has no highly erodible lands and no evidence of valleys or gullies in the fields. If erosion becomes evident with monthly inspections, it will be repaired as listed below:
    - Erosion will be filled by tillage or by importing topsoil
    - The area will be seeded with the original grass mix as listed in the water quality trading plan.
    - Erosion mat will be applied to the reseeded area.
    - American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.
3. **Harvesting**. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand.
    - The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
    - Frequency of the cutting will be dictated by the forage quality required.
    - The field should not be harvested after September 1st to allow for winter ground cover.
4. **Nutrient Management.** The field will be operated to draw down the high phosphorus level as based upon UW soil tests. This will be done by removing the grass hay crop without replacing Phosphorous. The nutrients will be drawn down to the optimum level on the soil test, at which point in time fertilizer can be applied to maintain the optimum level on the soil test. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the optimum level.
5. **Soil Sampling.** Soil sampling will be completed on a 4 year schedule to monitor the nutrients and maintain them at a level no higher than the optimum range. The soil tests will be used to prescribe the correct fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section. The sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW Soil & Forage Analysis Lab in Medford. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension Bulletin A2809.
6. **Inspection** is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be monthly during the growing season. The following inspection and reporting procedure shall be used:
    - **Monthly Reporting (<u>seeding year</u>) -** Each month the Soil Conservationist or Engineer shall file the report with the Clerk assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained. This monthly update will also be used to record the following:
        - Harvest dates

    - Approximate hay yields to determine nutrient removal rate
- **Quarterly Reporting (<u>second year</u>)** Quarterly reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>third year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer, and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Notification of Problems with Permanent Grass Cover -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

**WATER QUALITY TRADING INSPECTION FORM**
**FOR THE CITY OF GREENWOOD**
**LOCATION: THE NE 1/4 - SW ¼, SECTION 8, T.26N. – R.2W.**

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual

Practice compliance (check appropriate box)

Seeding year ☐

Photo taken ☐

Established perennial hay crop ☐

Filter strip ☐

Summary of findings:

_____

_____

_____

_____

_____

Identification of Items of non-compliance:

_____

_____

_____

Corrective measures required:

_____

_____

_____

Notice of **non-compliance** to the DNR required: Yes: _____ No: _____

Phosphorus credits used by City (annual report only): _____

Phosphorus credits available (annual report only): _____

Phosphorus credits deductions for failed practice

| Field # | Failed practice & reason | Credit Deduction |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

| FIELD # WHERE PHOTO WAS TAKEN | # OF PHOTOS TAKEN | GENERAL CONDITION OF FIELD |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# WQ1: P Trade Report

| | |
|---|---|
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field no filter strip - Copy.snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP |
|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 |
| wayne 2 | FLAMBEAU | FhB | 5 | 12 |
| **Total** | | | **5** | **12** |



RIETHMILLER
ATTACHMENT J

# WQ1: P Trade Report

| Reported For | Wayne Riethmiller |
|---|---|
| Printed | 2018-08-01 |
| Plan Completion/Update Date | 2018-05-24 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | |
|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2019 | 2020 | 2021 | 2022 | 2023 |
| wayne 2 | FLAMBEAU | FhB | 5 | 6 | 4 | 2 | 2 | 2 |
| **Total** | | | **5** | **6** | **4** | **2** | **2** | **2** |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Grass hay<br>None | Corn silage<br>Spring MB Plow | 190-0-105 | 0 | 0 | 38-38-40 | 38-38-40 | 0-38-0 | 152-0-65 | 19-19-20 (19-19-20)<br>19-19-20 | 200 lb | Spring<br>Unincorp | 1,000 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Corn silage Spring MB Plow | Corn silage Spring Chisel, disked | 190-0-105 | 0 | 0 | 38-38-40 | 38-38-40 | 0-38-0 | 152-0-65 | 19-19-20 (19-19-20) 19-19-20 | 200 lb | Spring Subsurface | 1,000 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Corn silage Spring Chisel, disked | Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow | 20-0-210 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 20-0-88 | Potassium chloride 0-0-61 | 200 lb | Spring Unincorp | 1,000 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Oats w/ Alfalfa/Brome Seeding Spring Spring MB Plow | Alfalfa/Brome None | 0-0-180 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-58 | Potassium chloride 0-0-61 | 200 lb | Spring Unincorp | 1,000 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-180 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-58 | Potassium chloride 0-0-61 | 200 lb | Spring Unincorp | 1,000 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **Wayne Riethmiller** |
| **Printed** | **2018-08-01** |
| **Plan Completion/Update Date** | **2018-05-24** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Wayne Reithmiller\wayne reithmiller corn silage up slope field .snapDb**

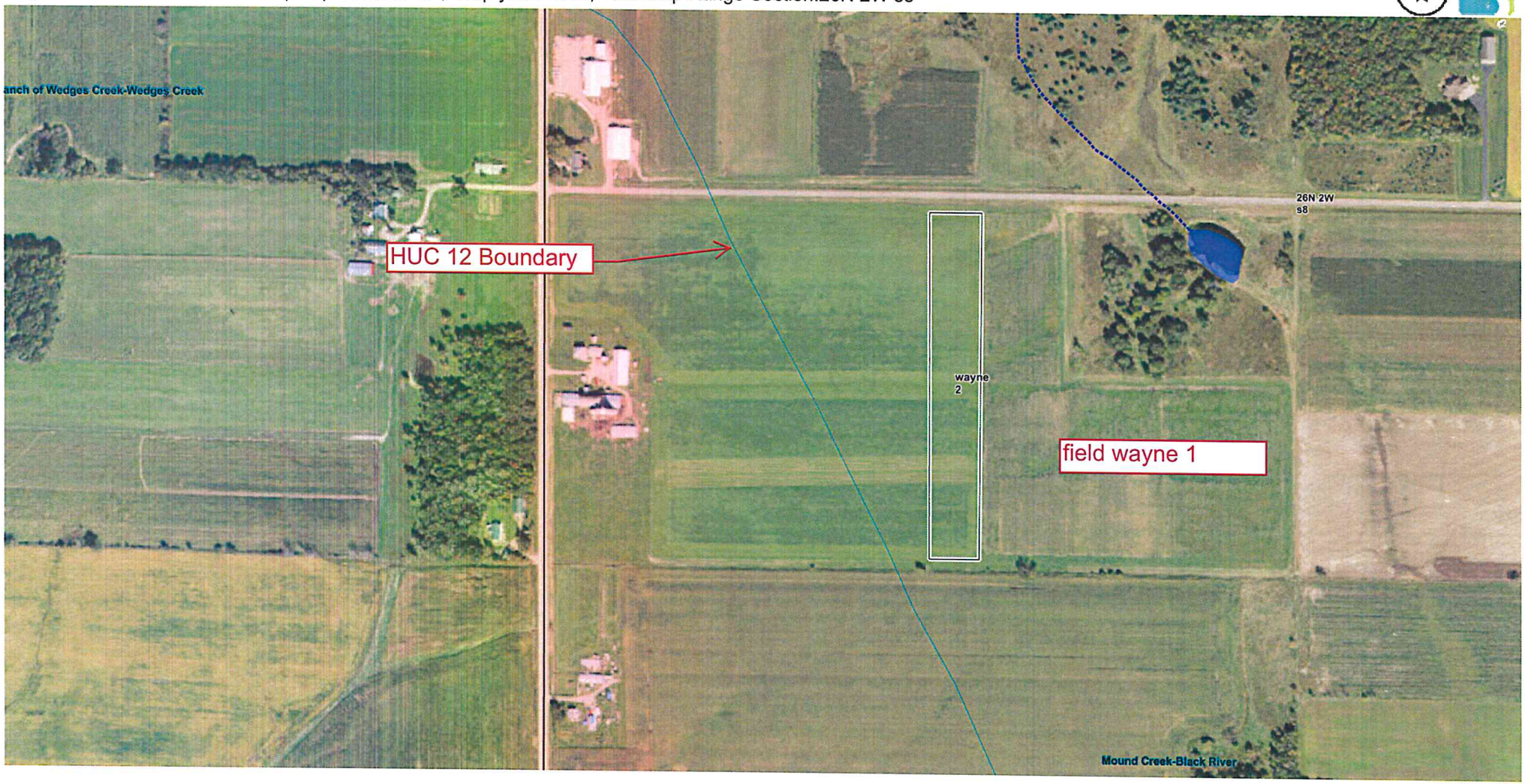
**Prepared for:**
Wayne Riethmiller
attn:Wayne Reithmiller

## Field Data: 5 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| wayne 2 | 5 | Alfalfa/Brome None | Alfalfa/Brome None | 0-0-180 | 0 | 0 | 0-0-122 | 0-0-122 | 0-0-0 | 0-0-58 | Potassium chloride 0-0-61 | 200 lb | Spring Unincorp | 1,000 lb |

# Attachment J

Map Generated on:8/1/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s8




- Intermittent Streams
- Waterbodies
- HUC 12 Watershed
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Nutrient prohibited areas (buffers vary by feature)
- Nutrient prohibited areas (drawn manure prohibited areas)
- Grassed waterway
- Non-eroding channel
- Ephemeral erosion channel
- Ditch
- Gully
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

ATTACHMENT K

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Checklist

Form 3400-208 (1/14)



**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Kayla Schar | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

| Receiving Water Name | Parameter(s) being traded | HUC 12(s) |
|---|---|---|
| Black River | Phosphorus | 070400070405 |

## Credit Generator Information

Credit generator type (select all that apply):

- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant? ◉ Yes; HUC 12: See Attachment A ○ No

Are any of the credit generators downstream of the applicant? ◉ Yes ○ No

Will a broker/exchange be used to facilitate trade? ○ Yes *(include description and contact information in WQT plan)* ◉ No

## Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)

Are each of the point source credit generators identified in this section in compliance with their WDPES permit requirements? ○ Yes ○ No

| Discharge Type | Permit Number | Name | Contact Information | Trade Agreement Number |
|---|---|---|---|---|
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |

**Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.***

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Summary of discharge and existing treatment including optimization | ◯ Yes | ◯ No | |
| b. Amount of credit being generated | ◯ Yes | ◯ No | |
| c. Timeline for credits and agreements | ◯ Yes | ◯ No | |
| d. Method for quantifying credits | ◯ Yes | ◯ No | |
| e. Tracking and verification procedures | ◯ Yes | ◯ No | |
| f. Location of credit generator in proximity to receiving water and credit user | ◯ Yes | ◯ No | |
| g. Other: _____ | ◯ Yes | ◯ No | |

**Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)**

| Discharge Type | Practices Used to Generate Credits | Method of Quantification | Trade Agreement Number | Have the practice(s) been formally registered? |
|---|---|---|---|---|
| ◯ Urban NPS<br>◉ Agricultural NPS<br>◯ Other | Filter/Buffer strips<br>NoTill/Reduced Tillage | SnapPlus | Section C1 | ◉ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◉ Agricultural NPS<br>◯ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C2 | ◉ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◉ Agricultural NPS<br>◯ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C3 | ◉ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | ◯ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | ◯ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | ◯ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | ◯ Yes<br>◯ No<br>◯ Only in part |
| ◯ Urban NPS<br>◯ Agricultural NPS<br>◯ Other | | | | ◯ Yes<br>◯ No<br>◯ Only in part |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Description of existing land uses | ◉ Yes | ◯ No | |
| b. Management practices used to generate credits | ◉ Yes | ◯ No | |
| c. Amount of credit being generated | ◉ Yes | ◯ No | |
| d. Description of applicable trade ratio per agreement/management practice | ◉ Yes | ◯ No | |
| e. Location where credits will be generated | ◉ Yes | ◯ No | |
| f. Timeline for credits and agreements | ◉ Yes | ◯ No | |
| g. Method for quantifying credits | ◉ Yes | ◯ No | |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| h. Tracking procedures | ◉ Yes | ○ No | |
| i. Conditions under which the management practices may be inspected | ◉ Yes | ○ No | |
| j. Reporting requirements should the management practice fail | ◉ Yes | ○ No | |
| k. Operation and maintenance plan for each management practice | ◉ Yes | ○ No | |
| l. Location of credit generator in proximity to receiving water and credit user | ◉ Yes | ○ No | |
| m. Practice registration documents, if available | ◉ Yes | ○ No | |
| n. History of project site(s) | ◉ Yes | ○ No | |
| o. Other: _____ | ○ Yes | ○ No | |

**The preparer certifies all of the following:**

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Tom Latham | 2·21·19 |

**Authorized Representative Signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Kayla Acharz | 2/22/2019 |

**RIETHMILLER**
**ATTACHMENT L**

**Certification of Section C-2 of The Water Quality Trading Plan**

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schar

Kayla Schar, City Clerk

Project Engineer:

Larry Gotham

Larry Gotham P.E., Morgan & Parmley Ltd.

Attachment M

**From:** Craig, Andrew D - DNR
**To:** Arch, James
**Cc:** Hartenbower, Benjamin P - DNR; Claucherty, Matthew L - DNR
**Subject:** RE: WQT trade fields and ag producer name and map showing field location
**Date:** Tuesday, January 22, 2019 9:05:11 AM

---

Your report is exactly what we needed, Jim. Thank you for stopping by Wayne's place to confirm field history.

We will use this info within our review of the Greenwood WQT.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Andrew Craig
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov

**From:** Arch, James <James.Arch@co.clark.wi.us>
**Sent:** Monday, January 21, 2019 12:03 PM
**To:** Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
**Cc:** Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
**Subject:** RE: WQT trade fields and ag producer name and map showing field location

Morning Andrew,

Just wanted to follow up with you on the Wayne Reithmiller field. I stopped and talked to Wayne on Sat. Wayne said that the whole 20 acres was seeded down into a grass-alfalfa mix in the spring of 2018. The field was previously in corn silage for 3 years and a mow board plow was used each year. The map I sent you that shows the sod boarder should have been moved further west. There was a corn field there but that is outside of the 20 acres in question.

Let me know if you have any more questions Andrew.

Jim Arch
Clark Co. Land Conservationist
517 Court Street, Room 102
Neillsville, WI 54456
715-743-5102

**From:** Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
**Sent:** Friday, January 18, 2019 4:00 PM
**To:** Arch, James <James.Arch@co.clark.wi.us>

**Cc:** Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
**Subject:** RE: WQT trade fields and ag producer name and map showing field location

Thanks Jim for compiling the map and providing your report on current crops on field.

The SNAP report submitted to us states the entire field is in corn silage (and has been the prior two years). Your report confirms a section of the field is now in grass sod, not corn silage.

The other item we would like to confirm is has the field been received MB plow in last two years. This is what the SNAP dbase shows that was submitted for review. This is important b/c MB plow creates more soil disturbance/soil loss than other tillage types. You stated MB plow is still a regular tool used in Clark County (used primary on fields with rocky soils – rocks damage chisel or chisel disc plow equipment; MB plow is not damaged from rocks.

For what its worth, can you please stop to discuss our questions re: crop and tillage history for field with Wayne either tonight or sometime next week?

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Andrew Craig
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov

**From:** Arch, James <James.Arch@co.clark.wi.us>
**Sent:** Thursday, January 17, 2019 11:43 AM
**To:** Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
**Cc:** Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
**Subject:** RE: WQT trade fields and ag producer name and map showing field location

Morning Andrew,

I checked out the Wayne Riethmiller field and part of that field is in sod-see attached map. The part to the west of the hay is was in corn, I couldn't see to the back so I can't speak to what that was. If you want I can try and stop and talk to Wayne after work tonight.

Jim Arch
Clark Co. Land Conservationist
517 Court Street, Room 102
Neillsville, WI 54456

715-743-5102

-----Original Message-----
From: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Sent: Tuesday, January 15, 2019 5:32 PM
To: Arch, James <James.Arch@co.clark.wi.us>
Cc: Hartenbower, Benjamin P - DNR <Benjamin.Hartenbower@wisconsin.gov>; Claucherty, Matthew L - DNR <Matthew.Claucherty@wisconsin.gov>
Subject: WQT trade fields and ag producer name and map showing field location

Jim,

Thanks for talking with me by phone today re: Greenwood WQT proposal.

Below is the landowner and field info we discussed. Can you please review and let us know if you can confirm use of moldboard plow?

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Andrew Craig
Nonpoint Source Watershed Planning Coordinator - Bureau of Watershed Management Division of External Services Wisconsin Department of Natural Resources
Phone: (608) 267-7695
Andrew.Craig@wisconsin.gov<mailto:Andrew.Craig@wisconsin.gov>

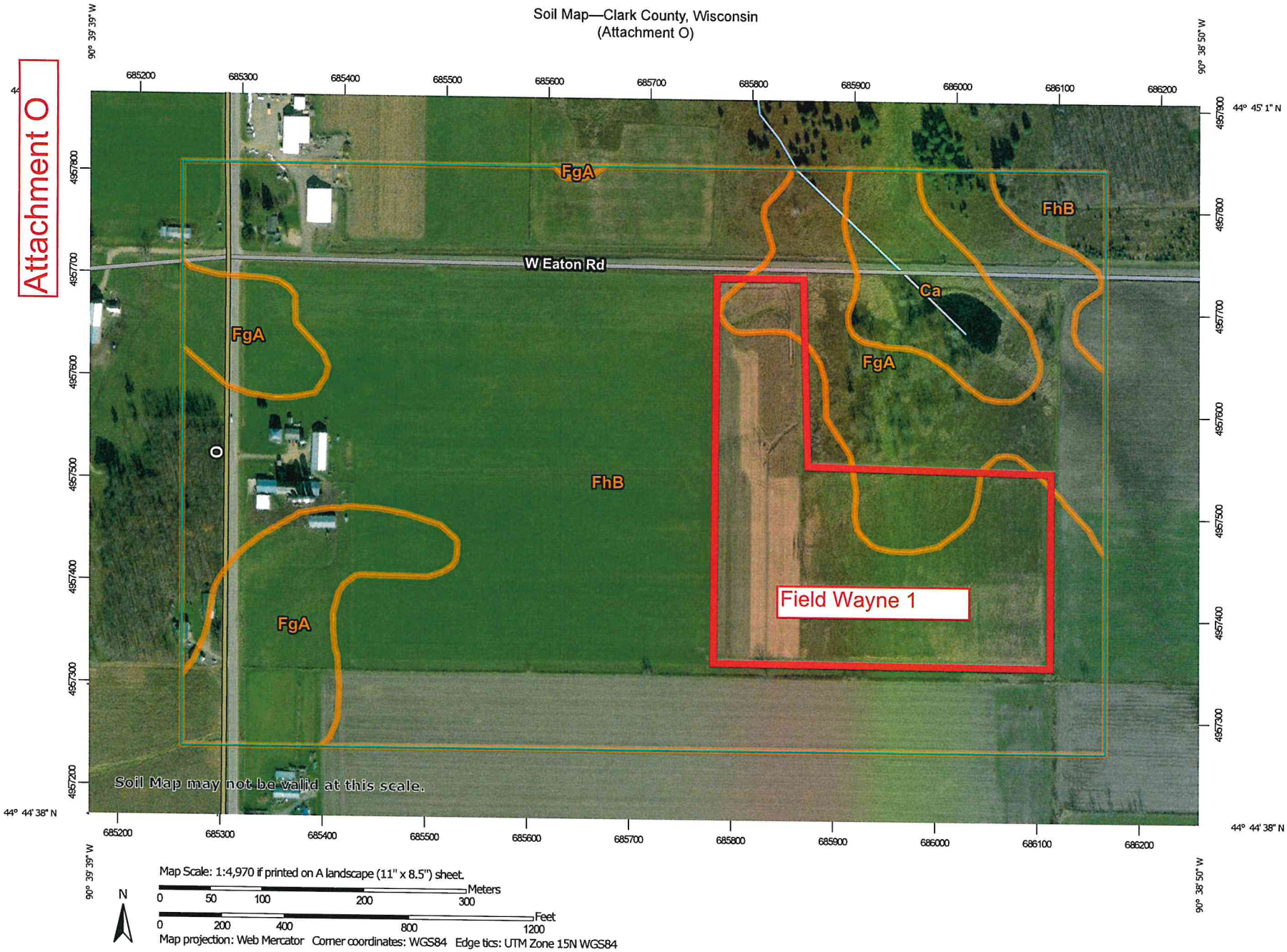
**ATTACHMENT N**

**Photo 1. of Wane Riethmiller's Plow**

**Photo 2. of Wane Riethmiller's Plow**

Attachment O

Soil Map—Clark County, Wisconsin
(Attachment O)




Map Scale: 1:4,970 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County, Wisconsin
Survey Area Data: Version 17, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2015—Nov 7, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Ca | Capitola-Marshfield-Veedum complex, 0 to 2 percent slopes | 6.1 | 4.8% |
| FgA | Fallcreek-Merrillan complex, 0 to 3 percent slopes | 28.8 | 22.5% |
| FhB | Flambeau loam, 1 to 6 percent slopes | 92.9 | 72.7% |
| **Totals for Area of Interest** | | **127.9** | **100.0%** |

# C-3 Trading Partner Plan: Patti Suda

## C-3 TRADING PARTNER: PATTI SUDA

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**PATTI SUDA ATTACHMENTS:**

A. HUC 12 Map

B. Patti Suda Farm Map

C. SnapPlus Reports, Existing Conditions

D. Farm Discharge Point

E. SnapPlus Reports, Proposed Conditions

F. Management Practice Registration Form

G. DNR Trade Ratio Calculation

H. Operation and Maintenance Manual

I. Water Quality Trading Checklist

J. Certification of Section C-3 of the Water Quality Trading Plan

## C-3 TRADING PARTNER: PATTI SUDA

**A. EXECUTIVE SUMMARY:**

The fields we are proposing to use as a Phosphorus trade are owned by Patti Suda. The farm was acquired in 2018, it was formerly part of a larger dairy farm. Field Patti 1 & 2 were rented out for row crop production for 2016 and 2017 after retirement of the farmer. The fields used for this trade test excessively high in Phosphorous from past manure applications, but have fairly low PTP under current management because the fields were set up to be farmed on the contour, when they were part of the dairy farm. Field Patti 1 & 2 will be converted from row crop production to a conservation easement in perennial vegetation, harvested for hay. The remainder of the farm is currently established in grass hay, which makes it ineligible for this water quality trade because no credit can be generated from it. All fields will remain in hay production for the term of the contract.

Field Patti 1 & 2 will generate on average from 2018-2023, approximately 72 of PTP per year. The proposed trade ratio to be applied will have an Uncertainty factor of 1:1, Equivalency Factor N/A, Downstream Trading Factor of 1.1:1. The proposed minimum trade ratio is 1.2:1 (PTP of 72± /1.2= 60± lb. of tradeable Phosphorous) see table 4 for year by year credit generation.

**B. LOCATION OF AGRICULTURAL PROPERTY**: The farm generating the phosphorus credits is located upstream of the City of Greenwood's outfall, in the same HUC 12 watershed, but runoff from the farm discharges into the Black River through an intermittent stream approximately 1000' downstream of the WWTF Outfall (see Attachment D for discharge location). Attachment A shows the drainage area's HUC 12 map with the Suda Farm highlighted. The fields are located in the W ½ of the SE ¼, of Section 33, T27N-R2W, Town of Werner, Clark County. Please refer to Attachment B for locations of fields Patti 1, Patti 2.

**C. EXISTING OPERATION:** Field Patti 1 and Patti 2 were part of a dairy farm owned by Walter Hribar, they test excessively high in phosphorous from historical over application of manure and will make good candidates for a Water Quality Trade. When the former dairy farmer retired, the land was rented out. The last two years Patti 1 and Patti 2 were rented out for row crop production. Patti 1 was seeded to soybeans in 2016 and 2017, field Patti 2 was seeded to corn in 2016, and soybeans in 2017. The crops grown in 2016 were determined based upon the Cropland Data Layer from National Agriculture Statistics Service (CropScape); the crop grown in 2017 was verified by the remaining stubble at the time of soil sampling. The remainder of the tillable land has been in hay for the last two years and will not be include in this trade because no credit can be generated from it.

**D. SOIL SAMPLING:** Soil samples for fields Patti 1 & 2, were collected in April of 2018, refer to Attachment B for field map. Soil samples for the fields in the trade were collected in accordance with UWEX Publication A2100. All soil samples are tested by UW lab in Marshfield. Sampling procedure: fields are divided into approximately 5 acre sections; one composite sample is made for each section. The sample is comprised of not less than 10 cores taken in the traditional "W" pattern. Fields with multiple composite samples are averaged to create a single recommendation for that field. See Attachment C for results.

**E. CROPLAND:** There are approximately 54 tillable acres on the farm. Field Patti 1 is 17 acres and Field Patti 2 is 7 acres, they will be converted from row crops to permanent hay. The remaining tillable land is currently in hay production and will remain as hay.

F. **SnapPlus - MODELING:** The SnapPlus file used to generate the existing conditions of the fields in this trade was generated by observing site conditions at the time of soil sampling and using standard farming practices of the area. Nutrient application is based on removal of nutrients contained in the grain. The current owners were unable to obtain and provide the input information from the renters from the last 2 years, so conservative estimates were made.

1. **Previous 2 Years of Cropping History:** A comparison of the Cropland Data Layer from National Agriculture Statistics Service (CropScape) and the crop residue at the time of soil sampling were used to determine cropping history. Field Patti 1 was seeded to soybeans in 2016 and 2017, field Patti 2 was seeded to corn in 2016, and soybeans in 2017.
2. **Current Conditions To Be Projected:** Nutrient applications, cropping and tillage data from 2016 and 2017 will be projected out to 2023.
3. **Tillage:** The fields within this trade are modeled as being chisel plowed and disked to prepare the seedbed for corn and soybeans.
4. **Rotation:** For the purposes of this WQT plan the rotation of 2016 and 2017 will be projected to 2023. Field Patti 1 will be continuous soybeans and field Patti 2 will be in a Corn grain - Soybean rotation.
5. **Credit Generation:** The Phosphorous Credits that we will be claiming will be generated, by perennial vegetative cover with a conservation easement. Perennial vegetation (hay) works to reduce Phosphorous runoff by trapping particulate Phosphorus, and also by no longer tilling the field which increases Phosphorous in runoff.
6. **Nutrients:** There will be no nutrients from manure modeled because there is not a record from 2016 or 2017 of any applications. Commercial fertilizer will be the only nutrient source modeled. The farm fields that were rented for row crop production will have nutrient applications based upon nutrient removal in the grain or standard rates which would be consistent with the practice of short term cash rent. Short term cash renters often apply nutrients without the benefit of a soil test, or apply the same fertilizer rate and blend on multiple farms to simplify the process of ordering and application.: Corn grain removes 0.38 lb. of Phosphorous and 0.29 lb. of potassium per bushel of grain at 15.5% moisture and 10 lb. of sulfur per 150 bu. Soybeans remove 0.80 lb. of Phosphorous and 1.4 lb. of potassium per bushel of grain at 13% moisture, and 0.18 lb. per bu. sulfur.

1. **Soybeans** @ 46 bu. per ac.
   - (46 bu.x0.80=37 lb.). phosphorous applied as 80 lb. of 18-46-0 (DAP))
   - (46 bu.x1.4=64.4 lb.). potassium applied as 107 lb. of 0-0-60 (Potash)
   - 50 lb. of Ammonium sulfate (AMS) standard practice of farmers, soybeans remove 0.18 lb. per bu. of sulfur but yield response is not reliable.
2. **Corn** @ 151 bu. per ac. standard dry fertilizer corn starter 9-20-30 @ a common rate used by farmers of 250 lb. per acre, which would supply: (9% x 250 lb.=22.5 lb. Nitrogen), (20% x 250 lb.=50 lb. Phosphorous), (30% x 250 lb.=75 lb. Potassium)
   - (151 bu. x 0.38=57 lb.). phosphorous required, applied 50 lb.
   - (151bu. x 0.29=44 lb.). potassium required, applied 75 lb.
   - 50 lb. of ammonium sulfate (AMS) @ 21-0-0-24s=12 lb. sulfur applied and 10.5 lb. Nitrogen
   - 140 lb. nitrogen recommendation: (22.5 lb. in starter fertilizer + 10.5 lb. applied in AMS + (225 lb. urea x 46% nitrogen=103.5 lb.)=137 lb. applied

## G. EXISTING CROP PRODUCTION:

1. **Corn Production** with a yield goal of 151-170 bu. per acre. Nutrient applications are based on the low end of the range. The seedbed for plating corn was prepared by spring chisel plowing and disking. The following nutrient application data is standard for corn. See Attachment C for specific field application data.
    - Commercial starter fertilizer 250 lb. per acre of 9-20-30
    - Sidedress application 50 lb. of ammonium sulfate and 225 lb. urea
    - total application to the crop 137-50-75, not including N credit from soybeans
2. **Soybean Production** with a yield goal of 46-55 bu. per acre. Nutrient application was based on the low end of the range. The seedbed for plating soybeans was prepared by spring chisel plowing and disking. It was not evident that the soybeans were drilled or planted in 30" rows, so they were modeled in 15"-20" rows which reduces the PTP for the farm by approximately 10lb. per year from 30" rows. The following nutrient application data is the standard for soybean production. See Attachment C for specific field application data.
    - 80 lb. DAP 18-46-0 = 14-37-0 pounds per acre
    - 50 lb. AMS 21-0-0-24s=11-0-0-12s pounds per acre
    - 107 lb. Potash 0-0-60 = 0-0-64 pounds per acre
    - Theoretical total application to the crop 25-37-64 pounds per acre

## H. POTENTIAL TRADEABLE PHOSPHORUS UNDER CURRENT MANAGEMENT:

SnapPlus Modeling was used to quantify Potentially Tradeable Phosphorus. SnapPlus was used to model the fields under projected current management practices. The current management: crops and nutrient applications will be modeled out to 2023 to create a baseline to measure the effectiveness of conservation practices implemented to reduce phosphorus leaving the farm. The following Attachments were generated through the modeling process. Attachment C includes the following SnapPlus reports:

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report
- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

**TABLE 1 – Patti Suda Existing Conditions**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| PATTI SUDA | PATTY1 | FLAMBEAU | FhB | 16.6 | 66 | 66 | 66 | 66 | 65 | 65 |
| PATTI SUDA | PATTY2 | FLAMBEAU | FhB | 6.7 | 26 | 15 | 26 | 15 | 26 | 15 |
| **Total** | | | | **23.3** | **92** | **81** | **92** | **81** | **92** | **80** |

## I. CREDIT GENERATION - PROPOSED OPERATING CONDITONS OF THE FIELDS:

After the Water Quality Trading Plan has been approved by the DNR and accepted by the City of Greenwood, the farm will install or implement the conservation practices listed in the following section. The City and Patti Suda will enter into an agreement to maintain the conservation

practices. The agricultural land will be used to generate Phosphorus Credits through reduction of tillage and installing perennial vegetation (hay).

1. **Nutrient Management.** Field Patti 1 and Patti 2 test high in Phosphorous and will be operated to draw down the Phosphorus level. This will be done by withholding nutrient applications and removing crops without replacing the Phosphorus. Phosphorus will be drawn down to the optimum level on the soil test, before Phosphorous containing fertilizers will be applied.
2. **Soil Sampling.** Soil sampling will be conducted on a 4 year schedule to monitor the nutrients. The soil tests will be used to prescribe the proper fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section and the sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW lab in Marshfield. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension A2809.
3. **Cropping.** The fields will be seeded to alfalfa/grass with an oat nurse crop in 2018; 2019 to the termination of the contract the field will remain in grass hay.
4. **Tillage:** The field will be prepared for planting by a single pass of a vertical tillage tool, at a depth of approximately 1 ½". The field will not be tilled again for the term of the contract unless, to repair a greater erosion risk.
5. **Seeding:**
    - **Soil preparation.** The field will be prepared for planting by a single pass of a vertical tillage tool at a depth of approximately 1 ½".
    - **Primary Seed Sample.** Mix and Rate, 18 lb. per acre:

| | |
|---|---|
| 20% | Alfalfa |
| 30% | Fescue |
| 20% | Timothy |
| 30% | Orchard Grass |

    - **Nurse Crop.** 1 bushel per acre of oats will be seeded with the grass mix as a conservation practice to reduce sediments leaving the field during establishment. Oats are a cool season annual grass that will provide ground cover. The nurse crop will be taken off as hay in the boot stage.
    - **Seed Placement.** Seed will be sown by broad casting with a sufficient amount of fertilizer to obtain the desired spread pattern through a fertilizer spreader. Upon final seed placement a single pass will be made with a large smooth drum roller.
    - **Harvest.** As appropriate to encourage dense growth, main upright plant growth, and remove nutrients trapped by grass, as hay.

J. **POTENTIALLY TRADEABLE PHOSPHORUS:** Will be generated through a Conservation Easement (contract) which generates credit though a reduction of tillage and perennial vegetation (hay), which provides year round ground cover and phosphorous trapping abilities. The following SnapPlus reports will be included in Attachment E to document the proposed operating conditions of the fields.

- Narrative and Crops Report
- Soil Test Summary
- Application Summary Report

- Fields Data and 590 Assessment Plan
- Producers Plan Report
- Phosphorous Trade Report

**TABLE 2 – PTP Perennial Vegetation – Phosphorus Runoff**

| Farm | Field | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 | PTP 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| PATTI SUDA | PATTY1 | FLAMBEAU | FhB | 16.6 | 23 | 8 | 7 | 5 | 4 | 4 |
| PATTI SUDA | PATTY2 | FLAMBEAU | FhB | 6.7 | 11 | 6 | 5 | 4 | 4 | 3 |
| **Total** | | | | **23.3** | **34** | **14** | **12** | **9** | **8** | **7** |

**K. PHOSPHORUS TRADE RATIOS:** The Potentially Tradeable Phosphorus values generated through SnapPlus modeling do not reflect the trade ratios. The trade ratio is applied to determine the Phosphorus Credits available resulting from changes in management practices. Following are the trade ratio factors:

- **Delivery -** N/A Credit generator and user within same HUC 12
- **Downstream** – 1.1:1 The runoff from this field discharges into the Black River approximately 1000' downstream of the WWTF Outfall, via an intermittent stream See Attachment D
- **Equivalency -** N/A for Phosphorus
- **Uncertainty** – Conservation Easement, perennial vegetation for the term of the contract. 1:1 per Table 16, Pg. 57 of A WQT How To Manual WI DNR,
- **Habitat Adjustment -** N/A no habitat work

The sum of the Trade ratio factors yields a 1.1:1 ratio, however the maximum allowed trade ratio from a nonpoint source to a point source is 1.2:1. **Therefore, a 1.2:1 trade ratio will be applied between the Patti Suda and the City of Greenwood WWTF**.

**L. REPORTING:**

**(REFER TO ATTACHMENT H – OPERATION AND MAINTENANCE PLAN)**

**M. PHOSPHORUS CREDIT GENERATION:** Credits are calculated as the difference between phosphorus lost under current baseline practices and phosphorus lost under the proposed practices. The credits are calculated on an annual basis. The table below shows the trade rates per year beginning in 2018 and extending to 2023. Credits will be available in 2018 upon successful establishment of perennial vegetation (hay).

**TABLE 3: TRADEABLE PHOSPHORUS**

| | Soil Series | Soil Symbol | Acres | PTP 2018 | PTP 2019 | PTP 2020 | PTP 2021 | PTP 2022 |
|---|---|---|---|---|---|---|---|---|
| **Past Practices PTP** | FLAMBEAU | FhB | **23.3** | **92** | **81** | **92** | **81** | **92** |
| **Perennial Vegetation PTP** | FLAMBEAU | FhB | **23.3** | **34** | **14** | **12** | **9** | **8** |
| **Total PTP** | FLAMBEAU | FhB | **23.3** | **58** | **67** | **80** | **72** | **84** |
| **Total Credits w/1.2:1 trade ratio** | | | **23.3** | **48** | **56** | **67** | **60** | **70** |

**<u>Tradeable phosphorous in years 2024 and beyond will be based upon the 2023 Total Tradeable Phosphorus of 70 pounds per year.</u>**

**N. MANAGEMENT PRACTICE REGISTRATION:** Submit the following to the DNR to register that the management practices have been installed (2018):

- Date of contract
- Management Practice Registration form Attachment F
- Date corrective measures have been completed
- Date of 90% ground cover and photo verification
- Report any deviation of the applied practices as outlined in the WQT plan, and any seeding failures that will need to be reseeded prior to the close of the first growing season

1. **Monthly Reporting:** Each month the City shall report that the management practices installed are being maintained in a manner consistent with the WQT plan. This will be done by making a statement, as a comment on the monthly discharge report **certifying that management practices established are in good condition and properly maintained.**

2. **Annual Reporting**: The City will file an annual report to the DNR of the status of management practices and provide an update of the overall trading project. The content of the annual report will include:
   - Verification that site inspection has occurred
   - Brief summary of site inspection findings
   - Identification of noncompliance or failure to follow any of the terms or conditions of the trading plan that have not been previously reported
   - At least 1 photo of the perennial vegetation, indicating condition
   - A summary of credits used each month over the calendar year
3. **Notification of Problems That Affect Credit Generation:** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the city are not being generated as approved in the WQT plan. The city will work with the farmer to restore or correct the deficiency, and update the DNR on the progress.

**O. DNR RIGHT OF ENTRY:** Patti Suda grants to the DNR the Right to inspect the management practices throughout the term of the WQT plan for the purpose of verifying that the WQT plan is being implemented, with prior notification.

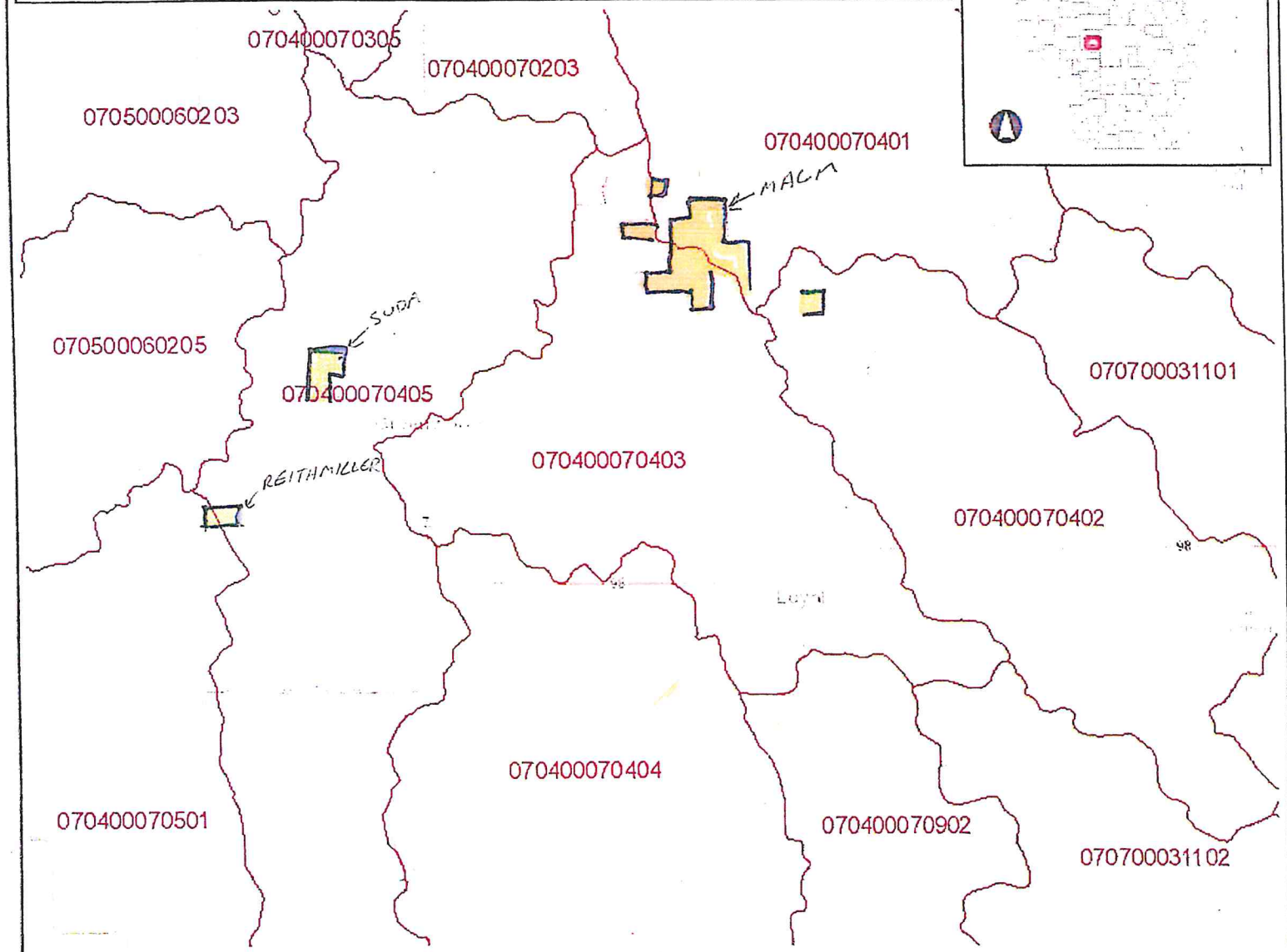
**P. COMPLIANCE WITH THE WATER QUALITY TRADING CHECKLIST**

This WQT Plan complies with the required content of a WQT Plan as outlined in the checklist located on Table 8, page 37 of Guidance for Implementing Water Quality Trading Plans, Guidance No:3800-2013-04; Form 3400-208 is included as Attachment J. This WQT Plan falls under Credit Source Column (e) "credits obtained from a constructed project or implementation of a plan undertaken by the credit user for sources other than that covered by the credit users WPDES permit". Below are listed the checklist questions, **bold and underlined**, with the answers following.

- **Permittee's/credit user's WPDES permit number**: No. WI 020249-09
- **Permittee's/credit users contact information:** Lonna Klinke, City Clerk
  102 N. Main Street
  Greenwood WI 54437
  Phone 715-267-6205

| | |
|---|---|
| • **Pollutant for which credit will be generated:** | Phosphorus |
| • **Amount of Credits available from each location, management practice, local government unit when acting as broker:** | See Table 4, page 5 |
| • **Certification that the content of the trading application is accurate and correct.** | See Section S, page 7 |
| • **Signature and date of signature of permittee's/ credit users authorized representative:** | See Section S, page 7 |
| • **Location where credits will be generated:** | See Attachment A and B |
| • **Identification of methods including management practices that will be used to generate credits:** | See Section I, page 3 |
| • **Duration of agreement with each credit generator:** | 5 years with the provision of extension, unless WPDES removes the phosphorous requirement |
| • **Schedule for installation/construction of each management practice:** | See Section I-3, page 3 |
| • **Operation and Maintenance plan for each management practice,** | See Attachment H |
| • **Date when credits become available for each management practice:** | See Section M |
| • **Models used to derive the amount of credits:** | SnapPlus, see Attachment C & E |
| • **The applicable trade ratio for each management practice including supporting technical basis:** | See section K, page 5 |

# Surface Water Data Viewer Map




**Legend**

- 12-digit HUCs (Subwatersheds)
- Municipality
- State Boundaries
- County Boundaries
- Major Roads
  - Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads
  - County HWY
  - Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

**Notes**

4.0 0 2.00 4.0 Miles

NAD_1983_HARN_Wisconsin_TM

1: 126,720

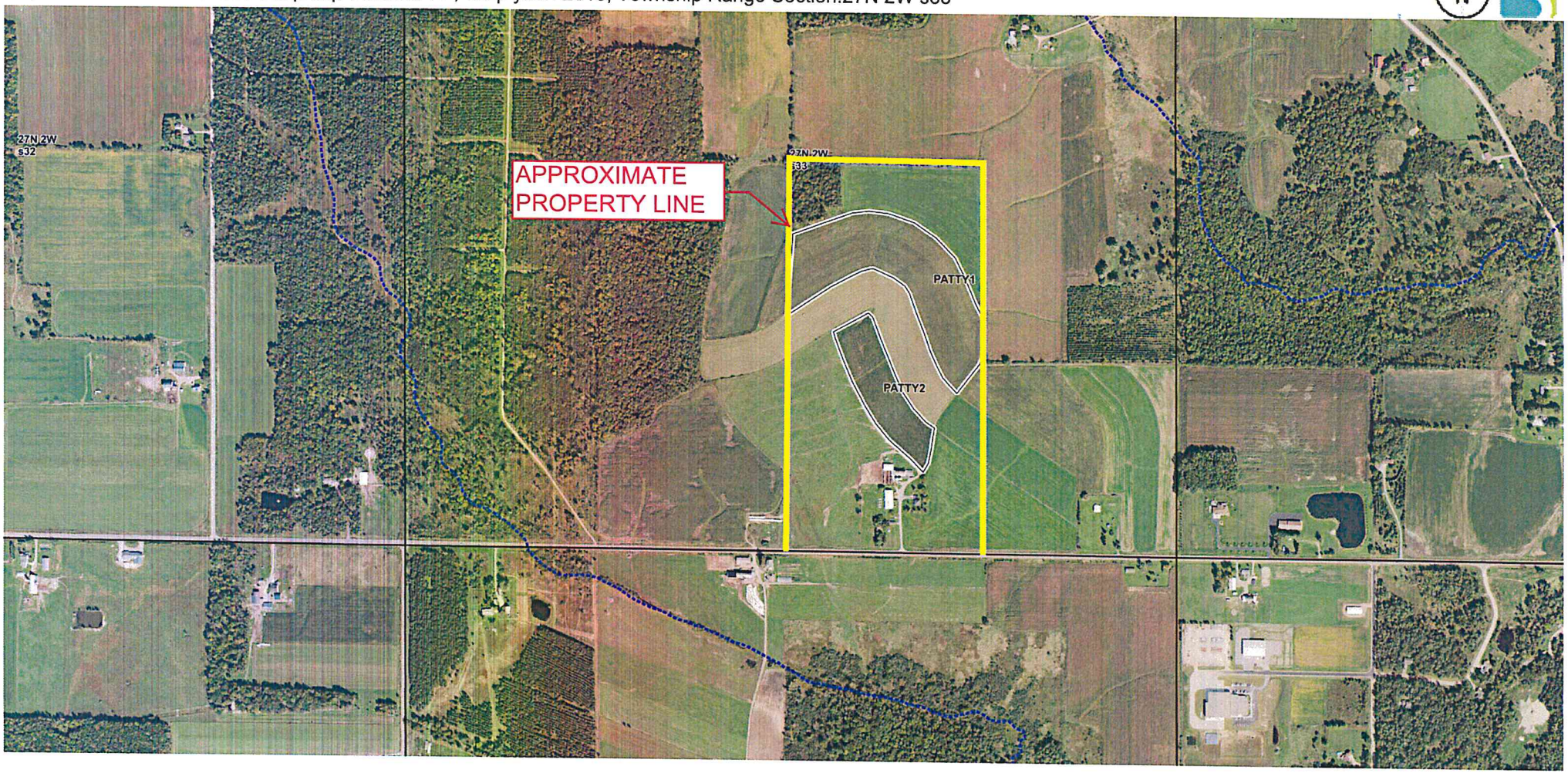
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/

SUDA

ATTACHMENT A

# Attachment B

Map Generated on:9/5/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:27N 2W s33




- Intermittent Streams
- Counties
- Township/Range
- Areas contributing runoff to direct conduits to groundwater
- Headland stacks
- Not farmed
- Grass filter area
- Vegetated buffer
- Non-metallic mine
- Water
- Sinkhole/other karst feature
- Other
- County Defined Karst Features
- Fields
- Drinking Well
- Public well
- Irrigation well
- Sinkhole
- Non-metallic mine
- Fractured bedrock at surface
- Other direct conduit
- Tile outlet

SUDA
ATTACHMENT B

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

**Farm** has 2 fields totalling 23.3 acres
**Farm Narrative:** None

**Annual Farm Notes:**

No Annual Farm Notes

**Spreader Calibration Methods:** No spreader calibration rate documentation has been selected.

**Narrative and Crops:**

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 |
| PATTY2 | 6.7 | Corn grain Spring Chisel, disked 151-170 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Corn grain Spring Chisel, disked 151-170 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 | Corn grain Spring Chisel, disked 151-170 | Soybeans 15-20 inch row Spring Chisel, disked 46-55 |

**Summary by Crop:**
**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**

SUDA
ATTACHMENT C

| Crops Grouped By Category | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Soybeans 15-20 inch row | Acres | 17<br>859 | 23<br>1,162 | 17<br>859 | 23<br>1,162 | 17<br>859 | 23<br>1,162 |
| Corn grain | Acres | 7<br>1,124 | | 7<br>1,124 | | 7<br>1,124 | |

# FM6: Soil Test Report

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| PATTY1 | | 16.6 | FhB | FLAMBEAU | 2018-05-03 | Soil & Forage Analysis Lab | 2075 | 3 | 1 | 7.0 | 2.9 | 63 | 270 | 0 | 0 |
| PATTY2 | | 6.7 | FhB | FLAMBEAU | 2018-05-03 | Soil & Forage Analysis Lab | 4793 | 1 | 1 | 7.0 | 2.8 | 120 | 274 | 0 | 0 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| PATTY1 | 2018-05-03 | | | | | X | |
| PATTY2 | 2018-05-03 | | | | | X | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

| Source |
|---|

## Application Results Reported For Farm All

### Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Fertilizer Nutrients Applied (lb) | N | 1,333 | 583 | 1,333 | 583 | 1,333 | 583 |
| | P2O5 | 949 | 862 | 949 | 862 | 949 | 862 |
| | K2O | 1,582 | 1,515 | 1,582 | 1,515 | 1,582 | 1,515 |
| Total Crop Removal (lb) | P2O5 | 1,066 | 932 | 1,066 | 932 | 1,066 | 932 |
| | K2O | 1,464 | 1,631 | 1,464 | 1,631 | 1,464 | 1,631 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | -117 | -70 | -117 | -70 | -117 | -70 |
| | K2O | 118 | -117 | 118 | -117 | 118 | -117 |

# NM3: Field Data and 590 Assessment Plan

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | | | | 16.6 | Clark | FLAMBEAU FhB | 4 | 250 | 0 - 2 | 1001 - 5000 | % | On contour / No | No | No | Sg15-Sg15-Sg15-Sg15-Sg15-Sg15-Sg15-Sg15 | SCD-SCD-SCD-SCD-SCD-SCD-SCD-SCD | 2016-2023 | **5** | **3.2** | **-0.2** | **4** | 63 | -24 | 0 |
| PATTY2 | | | | 6.7 | Clark | HUMBIRD HuC | 9 | 150 | 0 - 2 | 1001 - 5000 | W % | On contour / No | No | No | Cg-Sg15-Cg-Sg15-Cg-Sg15-Cg-Sg15 | SCD-SCD-SCD-SCD-SCD-SCD-SCD-SCD | 2016-2023 | **3** | **3.5** | **0.1** | **4** | 120 | -52 | -100 |

### Crop Abbreviations

| Abbreviation | Crop |
|---|---|
| Cg | Corn grain |
| Sg15 | Soybeans 15-20 inch row |

### Tillage Abbreviations

| Abbreviation | Tillage |
|---|---|
| SCD | Spring Chisel, disked |

**Restriction Legend**

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row Spring Chisel, disked | Soybeans 15-20 inch row Spring Chisel, disked | 0-0-0 | 20 | 0 | 25-37-65 | 45-37-65 | 45-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 830 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 1,328 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 1,776 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Soybeans 15-20 inch row Spring Chisel, disked | Corn grain Spring Chisel, disked | 140-0-0 | 0 | 0 | 137-50-75 | 137-50-75 | 0-50-75 | 3-0-0 | 9-20-30 9-20-30 | 250 lb | Spring Subsurface | 1,675 lb |
| | | | | | | | | | | | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Summer Unincorp | 335 lb |
| | | | | | | | | | | | Urea 46-0-0 | 225 lb | Summer Unincorp | 1,508 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb** | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row<br>Spring Chisel, disked | Soybeans 15-20 inch row<br>Spring Chisel, disked | 0-0-0 | 20 | 0 | 25-37-65 | 45-37-65 | 45-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 830 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 1,328 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 1,776 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Corn grain<br>Spring Chisel, disked | Soybeans 15-20 inch row<br>Spring Chisel, disked | 0-0-0 | 0 | 0 | 25-37-65 | 25-37-65 | 25-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 335 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 536 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 717 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row Spring Chisel, disked | Soybeans 15-20 inch row Spring Chisel, disked | 0-0-0 | 20 | 0 | 25-37-65 | 45-37-65 | 45-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 830 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 1,328 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 1,776 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Soybeans 15-20 inch row Spring Chisel, disked | Corn grain Spring Chisel, disked | 140-0-0 | 0 | 0 | 137-50-75 | 137-50-75 | 0-50-75 | 3-0-0 | 9-20-30 9-20-30 | 250 lb | Spring Subsurface | 1,675 lb |
| | | | | | | | | | | | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Summer Unincorp | 335 lb |
| | | | | | | | | | | | Urea 46-0-0 | 225 lb | Summer Unincorp | 1,508 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb** | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row Spring Chisel, disked | Soybeans 15-20 inch row Spring Chisel, disked | 0-0-0 | 20 | 0 | 25-37-65 | 45-37-65 | 45-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 830 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 1,328 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 1,776 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Corn grain Spring Chisel, disked | Soybeans 15-20 inch row Spring Chisel, disked | 0-0-0 | 0 | 0 | 25-37-65 | 25-37-65 | 25-37-65 | 0-0-0 | Ammonium sulfate (AMS) 21-0-0 | 50 lb | Spring Unincorp | 335 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP) 18-46-0 | 80 lb | Spring Unincorp | 536 lb |
| | | | | | | | | | | | Potassium chloride 0-0-61 | 107 lb | Spring Unincorp | 717 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row<br>Spring Chisel, disked | Soybeans 15-20 inch row<br>Spring Chisel, disked | 0-0-0 | 20 | 0 | 25-37-65 | 45-37-65 | 45-37-65 | 0-0-0 | Ammonium sulfate (AMS)<br>21-0-0 | 50 lb | Spring Unincorp | 830 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP)<br>18-46-0 | 80 lb | Spring Unincorp | 1,328 lb |
| | | | | | | | | | | | Potassium chloride<br>0-0-61 | 107 lb | Spring Unincorp | 1,776 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Corn grain<br>Spring Chisel, disked | Soybeans 15-20 inch row<br>Spring Chisel, disked | 0-0-0 | 0 | 0 | 25-37-65 | 25-37-65 | 25-37-65 | 0-0-0 | Ammonium sulfate (AMS)<br>21-0-0 | 50 lb | Spring Unincorp | 335 lb |
| | | | | | | | | | | | Diammonium phosphate (DAP)<br>18-46-0 | 80 lb | Spring Unincorp | 536 lb |
| | | | | | | | | | | | Potassium chloride<br>0-0-61 | 107 lb | Spring Unincorp | 717 lb |

# WQ1: P Trade Report

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |
| SnapPlus Version 17.1 built on 2018-05-25 | |
| M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - soybeans.snapDb | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

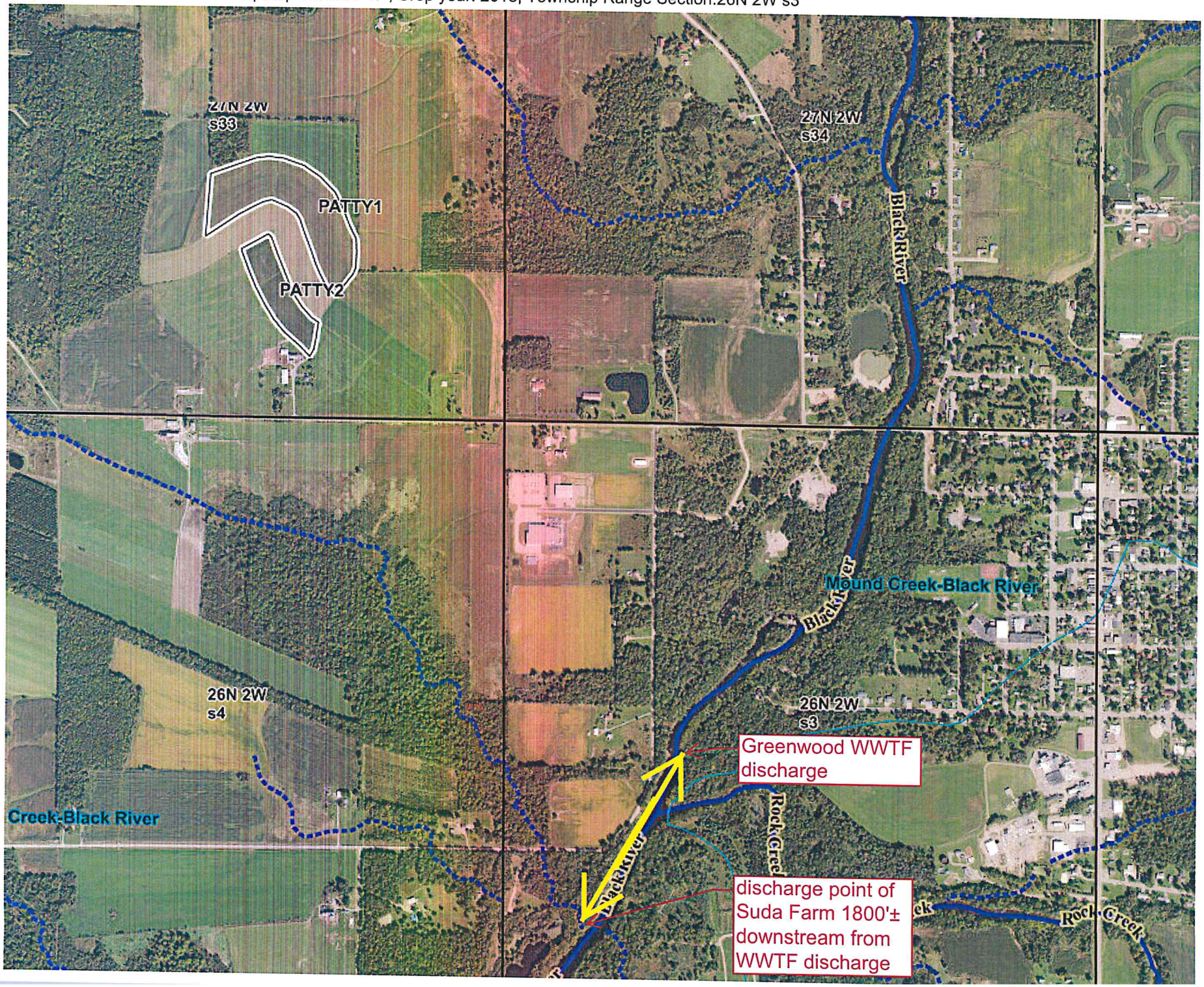
For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| PATTY1 | FLAMBEAU | FhB | 17 | 66 | 66 | 66 | 66 | 65 | 65 |
| PATTY2 | FLAMBEAU | FhB | 7 | 26 | 15 | 26 | 15 | 26 | 15 |
| **Total** | | | **23** | **92** | **81** | **92** | **81** | **92** | **80** |

# Attachment D

Map Generated on:9/5/2018 SnapMap Version: 17 , Crop year: 2018, Township Range Section:26N 2W s3




SUDA
ATTACHMENT D

# NM1: Narrative and Crops Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA -hay.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

**Farm** has 2 fields totalling 23.3 acres
**Farm Narrative:** None

**Annual Farm Notes:**

No Annual Farm Notes

**Spreader Calibration Methods:** No spreader calibration rate documentation has been selected.

**Narrative and Crops:**

| Field Name | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage 30-60 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 |
| PATTY2 | 6.7 | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage 30-60 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 | Grass hay None 3.1-4 |

**Summary by Crop:**
**NOTE: Yields calculated using the midpoint of the SnapPlus yield goal range for each crop.**



SUDA
ATTACHMENT E

| Crops Grouped By Category | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Grass hay | Acres | | 23<br>82 | 23<br>82 | 23<br>82 | 23<br>82 | 23<br>82 |
| Oats w/ Alfalfa/Grass Seeding Spring | Acres | 23<br>1,035 | | | | | |

# FM6: Soil Test Report

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |

SnapPlus Version 17.1 built on 2018-05-25

M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

| | | | Predominant | | | | | Samples | | | | in ppm | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Field Name | Subfarm | Acres | Soil Map Symbol | Soil Name | Soil Test Date | Soil Test Lab | Lab Number | Rec. # | Actual # | pH | OM% | P | K | S | CEC |
| PATTY1 | | 16.6 | FhB | FLAMBEAU | 2018-05-03 | Soil & Forage Analysis Lab | 2075 | 3 | 1 | 7.0 | 2.9 | 63 | 270 | 0 | 0 |
| PATTY2 | | 6.7 | FhB | FLAMBEAU | 2018-05-03 | Soil & Forage Analysis Lab | 2075 | 1 | 1 | 7.0 | 2.8 | 120 | 274 | 0 | 0 |

## Crop Year Soil Test Needed

| Field Name | Soil Test Date | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| PATTY1 | 2018-05-03 | | | | | X | |
| PATTY2 | 2018-05-03 | | | | | X | |

# FM2: Application Summary Report

| | |
|---|---|
| **Starting Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date:** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Annual Manure Production And Use By Source

Total Value = $ Value of all nutrients, incorporated including S.

**Source**

## Application Results Reported For Farm All

### Annual Pounds Of Available N, P2O5 And K2O Applied From Manure and Fertilizer.

| | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|
| Produced from Manure (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Available Manure Nutrients Applied (lb) | Ninj | 0 | 0 | 0 | 0 | 0 | 0 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Fertilizer Nutrients Applied (lb) | N | 0 | 2,144 | 2,144 | 2,144 | 2,144 | 2,144 |
| | P2O5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | K2O | 2,144 | 0 | 0 | 0 | 0 | 0 |
| Total Crop Removal (lb) | P2O5 | 1,282 | 1,282 | 1,282 | 1,282 | 1,282 | 1,282 |
| | K2O | 4,893 | 4,544 | 4,544 | 4,544 | 4,544 | 4,544 |
| Nutrient Balance (Applied - Crop removal, lb) | P2O5 | -1,282 | -1,282 | -1,282 | -1,282 | -1,282 | -1,282 |
| | K2O | -2,749 | -4,544 | -4,544 | -4,544 | -4,544 | -4,544 |

# NM3: Field Data and 590 Assessment Plan

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |

SnapPlus Version 17.1 built on 2018-05-25

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23 Total Acres Reported.

| Field Name | Sub Farm | FSA Trct | FSA Fld | Acres | County | Critical Soil Series & Symbol | F. Slp % | F.Slp Len ft | Below Field Slope To Water % | Dist.To Water ft | N/Fld Res | Contour/ Filters | Irrig | Tiled | Rotation | Tillage | Report Period | Field "T" t/ac | Rot Avg Soil Loss t/ac | SCI | Rot Avg PI | Soil Test P ppm | Rot P2O5 Bal lb/ac | P2O5 Bal Target lb/ac |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | | | | 16.6 | Clark | FLAMBEAU FhB | 4 | 250 | 0 - 2 | 1001 - 5000 | % | On contour / No | No | No | OgAGs-GH-GH-GH-GH-GH | SVT-None-None-None-None-None | 2018-2023 | **5** | **0** | **1.5** | **0** | 63 | -330 | 0 |
| PATTY2 | | | | 6.7 | Clark | HUMBIRD HuC | 9 | 150 | 0 - 2 | 1001 - 5000 | W % | On contour / No | No | No | OgAGs-GH-GH-GH-GH-GH | SVT-None-None-None-None-None | 2018-2023 | **3** | **0** | **1.5** | **1** | 120 | -330 | -83 |

### Crop Abbreviations

| Abbreviation | Crop |
|---|---|
| GH | Grass hay |
| OgAGs | Oats w/ Alfalfa/Grass Seeding Spring |

### Tillage Abbreviations

| Abbreviation | Tillage |
|---|---|
| None | None |
| SVT | Spring vertical tillage |

**Restriction Legend**

| Code | Description of Code |
|---|---|
| S | Field is in SWQMA |
| D | Drinking water well within 50 feet of field. |
| C | Conduit to groundwater within 300 feet |
| L | Local restrictions on nutrient applications. |
| % | Slope restriction for winter applications |
| P | High permeability N restricted soils |
| R | N restricted soils with less than 20 inches to bedrock |
| W | N restricted soils with less than 12 inches to apparent water table |
| + | This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present. |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2018** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2017 Crop and Tillage | 2018 Crop and Tillage | Adjusted Crop Need lb/ac | 2018 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Soybeans 15-20 inch row Spring Chisel, disked | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage | 20-0-0 | 20 | 0 | 0-0-92 | 20-0-92 | 0-0-92 | 0-0-0 | Potassium chloride 0-0-61 | 150 lb | Spring Unincorp | 2,490 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |
| PATTY2 | 6.7 | Soybeans 15-20 inch row Spring Chisel, disked | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage | 20-0-0 | 20 | 0 | 0-0-92 | 20-0-92 | 0-0-92 | 0-0-0 | Potassium chloride 0-0-61 | 150 lb | Spring Unincorp | 1,005 lb |
| | | | | | | | | | | | legume | | 20-0-0 | |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2019** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

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**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2018 Crop and Tillage | 2019 Crop and Tillage | Adjusted Crop Need lb/ac | 2019 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage | Grass hay None | 130-0-0 | 60 | 0 | 92-0-0 | 152-0-0 | 22-0-0 | 0-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 3,320 lb |
| | | | | | | | | | | | legume | | 60-0-0 | |
| PATTY2 | 6.7 | Oats w/ Alfalfa/Grass Seeding Spring Spring vertical tillage | Grass hay None | 130-0-0 | 40 | 0 | 92-0-0 | 132-0-0 | 2-0-0 | 0-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 1,340 lb |
| | | | | | | | | | | | legume | | 40-0-0 | |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2020** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb** | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2019 Crop and Tillage | 2020 Crop and Tillage | Adjusted Crop Need lb/ac | 2020 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 3,320 lb |
| PATTY2 | 6.7 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 1,340 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2021** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2020 Crop and Tillage | 2021 Crop and Tillage | Adjusted Crop Need lb/ac | 2021 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 3,320 lb |
| PATTY2 | 6.7 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 1,340 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2022** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |
| **SnapPlus Version 17.1 built on 2018-05-25** | |
| **M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb** | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2021 Crop and Tillage | 2022 Crop and Tillage | Adjusted Crop Need lb/ac | 2022 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 3,320 lb |
| PATTY2 | 6.7 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 1,340 lb |

# FM3: Producer's Plan Report

| | |
|---|---|
| **Crop Year** | **2023** |
| **Reported For** | **PATTI SUDA** |
| **Printed** | **2018-09-06** |
| **Plan Completion/Update Date** | **2018-05-16** |

**SnapPlus Version 17.1 built on 2018-05-25**

**M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb**

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

## Field Data: 23.3 Total Acres Reported.

| Field Name | Ac. | 2022 Crop and Tillage | 2023 Crop and Tillage | Adjusted Crop Need lb/ac | 2023 Legume Credit N lb/ac | 2nd Year N Manure Credit lb/ac | Manure Fert Apps lb/ac | Total Credits and Apps | Over-Application based on UW Recs | Under-Application based on UW Recs | Product Name and Analysis | Rate per Acre | Season and Method | Field Amount |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PATTY1 | 16.6 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 3,320 lb |
| PATTY2 | 6.7 | Grass hay None | Grass hay None | 130-0-0 | 0 | 0 | 92-0-0 | 92-0-0 | 0-0-0 | 38-0-0 | Urea 46-0-0 | 200 lb | Spring Unincorp | 1,340 lb |

# WQ1: P Trade Report

| Reported For | PATTI SUDA |
|---|---|
| Printed | 2018-09-06 |
| Plan Completion/Update Date | 2018-05-16 |
| SnapPlus Version 17.1 built on 2018-05-25 | |
| M:\M Drive\2014\2014-160 Greenwood Phosphorous\WATER QUALITY TRADING\Water Quality trading plan\Patty Suda\PATTY SUDA - hay.snapDb | |

**Prepared for:**
PATTI SUDA
attn:PATTI SUDA

The P Trade Report estimates the annual pounds of phosphorus (P) in surface runoff from cropland entering surface waters. These P loss calculations are based on a field's soil test P concentration, crops, tillage, nutrient management practices and estimates of average runoff and sheet and rill erosion for the predominant soil type. Losses from concentrated flow channel or gully erosion with a field are not included in these calculations. Field runoff losses are calculated for each year as **PTP** (lb P/field/yr). Fields are only included if there are at least 2 years of crops before the selected start year. Before using this report as part of a Water Quality Trade activity, phosphorus losses (PTP) must be converted into 'P credits' according to DNR guidance.

**Questions?** Please contact DNRphosphorus@wisconsin.gov

For more information go to **http://dnr.wi.gov/** and type keyword: **Water Quality Trading**

*This report was developed for Wisconsin DNR Water Quality Trading and Adaptive Management purposes and cannot be used to demonstrate compliance with NR 151 or NRCS 590 NM plan requirements.*

| P Trade Report | | | | PTP | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Field Name | Soil Series | Soil Symbol | Acres | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| PATTY1 | FLAMBEAU | FhB | 17 | 23 | 8 | 7 | 5 | 4 | 4 |
| PATTY2 | FLAMBEAU | FhB | 7 | 11 | 6 | 5 | 4 | 4 | 3 |
| **Total** | | | **23** | **34** | **14** | **12** | **9** | **8** | **7** |

**SUDA**

**ATTACHMENT F**

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Management Practice Registration

Form 3400-207 (R 1/14)

**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that is using water quality trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Lonna Klinke | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

## Broker/Exchange Information (if applicable)

Was a broker/exchange be used to facilitate trade? ○ Yes ◉ No

| Broker/Exchange Organization Name | Contact Name | |
|---|---|---|
| Address | Phone Number | Email |

## Trade Registration Information (Use a separate form for each trade agreement)

| Type | Trade Agreement Number | Practices Used to Generate Credits | Anticipated Load Reduction | Trade Ratio | Method of Quantification |
|---|---|---|---|---|---|
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | | Conservation Easement/ Perennial Vegetation, notill/reduced tillage, cover crops, filter/buffer strips | 1,000 | 1.2:1 | Snap plus |

| County | Closest Receiving Water Name | Land Parcel ID(s) | Parameter(s) being traded |
|---|---|---|---|
| Clark | Black River | see attached maps | Phosphorous |

## The preparer certifies all of the following:

- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Amy Lottam | 8-6-18 |

## Authorized Representative Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Lonna Klinke | 8-6-18 |

**Leave Blank -- For Department Use Only**

| Date Received | | Trade Docket Number |
|---|---|---|
| Entered in Tracking System ☐ Yes | Date Entered | Name of Department Reviewer |

**Larry Gotham**

**To:** Ezra Gotham (egotham@centurytel.net)
**Subject:** FW: Greenwood WQT

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

**From:** Oldenburg, Patrick S - DNR [mailto:Patrick.Oldenburg@wisconsin.gov]
**Sent:** Tuesday, September 12, 2017 8:53 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>; Larry Gotham <lgotham@centurytel.net>
**Subject:** RE: Greenwood WQT

For Greenwood and trading, the point of standards compliance is the outfall, so anything upstream of the outfall is considered "upstream". Since Rock Creek enters downstream of the outfall, there would need to be a small additional downstream trading factor (+0.1) for projects in Rock Creek. For example, if the practice would normally yield a 1:1 trade ratio, it would become a 1.1:1 ratio due to the downstream factor.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

**From:** Fassbender, Lori - DNR
**Sent:** Monday, September 11, 2017 4:55 PM
**To:** Larry Gotham <lgotham@centurytel.net>
**Cc:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Subject:** RE: Greenwood WQT

Pat,
Could you help Larry out with his question.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Lori Fassbender, PE
Phone: 715-284-1458
Lori.Fassbender@wisconsin.gov

**From:** Larry Gotham [mailto:lgotham@centurytel.net]
**Sent:** Friday, March 31, 2017 10:22 AM
**To:** Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
**Subject:** Greenwood WQT

Hi Lori: Would you please provide a map for the Greenwood WWTF that shows what the DNR will consider for upstream WQ Trading? Ideally the City would prefer to have the upstream trading area include the Rock Creek basin. Rock Creek flows through the City and a one to one trading ratio would make any stream projects more beneficial to both the State and the City. Thank you!

**Larry Gotham, P.E., R.L.S.**
***Morgan & Parmley, Ltd.***
***rusk surveying***
115 W. 2nd Street, South
Ladysmith, WI 54848
Office (715) 532-3721
(715) 532-5757
Fax (715) 532-5305

## Larry Gotham

**From:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>
**Sent:** Friday, February 02, 2018 9:17 AM
**To:** Larry Gotham; Fassbender, Lori - DNR
**Cc:** Ezra Gotham; Hartenbower, Benjamin P - DNR
**Subject:** RE: Greenwood WQT

Larry, we historically used the online USGS SPARROW Decision Support Tool to make these determinations, however that service is no longer available. We have a SPARROW training session scheduled with USGS later this month, so unfortunately a final answer will need to wait until that occurs. However, based on my previous use of the Decision Support Tool, it is very likely that there will be very little or even no adjustment in trade ratio due to the proximity of the site to the WWTP outfall.

In the meantime, if you want ad some conservatism to your planning, I wouldn't assume anything more than a 5% loss/adjustment factor based on the distance, as it will likely be less. After the training session later this month we will be able to provide you with a more precise answer on the trade ratio adjustment.

Finally, I'm transitioning out of my role as Adaptive Management/Trading coordinator for the region. Ben Hartenbower is taking up those duties. Here is his contact information:

Benjamin Hartenbower, PE
Wastewater Engineer
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701
Phone: (715) 839-3712
Benjamin.Hartenbower@wisconsin.gov

In the meantime, if there is anything else you need, just let us know.

**We are committed to service excellence.**
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Pat Oldenburg
Phone: 715 831-3262
patrick.oldenburg@wisconsin.gov

> **From:** Larry Gotham [mailto:lgotham@centurytel.net]
> **Sent:** Thursday, February 01, 2018 2:05 PM
> **To:** Oldenburg, Patrick S - DNR <Patrick.Oldenburg@wisconsin.gov>; Fassbender, Lori - DNR <Lori.Fassbender@wisconsin.gov>
> **Cc:** Ezra Gotham <egotham@centurytel.net>
> **Subject:** RE: Greenwood WQT
>
> Hi Pat:
> Greenwood has begun seeking WQT partners for phosphorus. We have an interested farmer upstream of our HUC 12. He is just over the line into HUC -305. Would there be an increase in the Trade Ratio at this location since it is not in our HUC? Thank you.
>
> **Larry Gotham, P.E., R.L.S.**

# Operation, Maintenance & inspection Plan
# Field Patti 1 & 2, Patti Suda Farm
For Water Quality Trading
City of Greenwood

The goal of the operation and maintenance plan is to ensure that the perennial grass cover will persist. The primary purpose of the grass cover is to reduce the phosphorus and sediments that leave the farm and degrade water quality on the Black River. The secondary purpose is to ensure that the grass cover is managed and maintained to produce a grass forage source for livestock. Success of the secondary purpose will be the best assurance that the primary goal is being met; a lush and vigorous stand of grass will have a high stem count maximizing trapped sediments and utilizing those sediments as nutrients to be removed by the following hay crop.

## Section 1 - Seeding Year 2018

A. **Seeding and site preparation** will be as outlined in the Water Quality Trading Plan
   - Germination of the nurse crop generally occurs within 10-20 days of planting
   - Germination of the grass seed generally occurs within 10-30 days of planting

B. **Harvest of the nurse crop** as hay at the boot stage. Upon harvest of the nurse crop, the grass stand will be evaluated.
   - Areas of poor germination larger than 1000 square feet will be reseeded by hand or with a drill.
   - Areas where the seed has been lost due to erosion will be reseeded as above but covered with biodegradable erosion mat.
   - Any gulley erosion will be repaired either by tillage or importing topsoil, reseeded and covered with biodegradable erosion mat.

C. **Clipping** of the weeds/grass hay will be done if weeds become competitive with the grass, the grass shall not be mowed lower than 6" or after September 1st.

D. **Harvesting** of the grass hay will be done when the grass matures. The grass shall not be mowed lower than 6" or after September 1st.

E. **Inspection Frequency** shall be **monthly** in the seeding year. Page 4 of this Operation & Maintenance Plan is an inspection form that shall be completed for each inspection. Inspections shall be completed by the County Soil Conservationist or Morgan & Parmley Ltd. These records shall be kept on file with the Clerk and be available for inspection by the DNR. Additionally, the Certified Waste Water Treatment Plant Operator for the City of Greenwood shall make a statement, as a comment, on the monthly discharge report certifying the condition of the management practices and that they are being properly maintained.

## Section 2 - 2019 and beyond

1. **Weed Management**,
    - Harvest of the hay will remove annual weeds, maintain perennial weeds, and prevent woody vegetation from developing.
    - Woody Vegetation - herbicide shall be applied to woody plants that encroach from the wood edge. If woody vegetation is allowed to persist and grow into trees it will shade out and kill the grass cover thereby creating a potential for soil erosion.
2. **Erosion control**. It is unlikely that there will be erosion issues or gully formation after the first year; the site has no highly erodible lands and no evidence of valleys or gullies in the fields. If erosion becomes evident with monthly inspections, it will be repaired as listed below:
    - Erosion will be filled by tillage or by importing topsoil
    - The area will be seeded with the original grass mix as listed in the water quality trading plan.
    - Erosion mat will be applied to the reseeded area.
    - American Excelsior Curlex Sediment logs will be placed 50' on center if the repaired erosion was a gully.
3. **Harvesting**. Forage will be harvested when the grass is mature and at a height and frequency necessary to maintain a productive stand.
    - The grass shall not be cut shorter than 4"; grass regrows from growing points at the base of the leaf blades, low cutting height removes the energy stored for regrowth in the stem, delaying regrowth of the field, and future yield potential.
    - Frequency of the cutting will be dictated by the forage quality required.
    - The field should not be harvested after September 1st to allow for winter ground cover.
4. **Nutrient Management.** The field will be operated to draw down the high phosphorus level as based upon UW soil tests. This will be done by removing the grass hay crop without replacing Phosphorous. The nutrients will be drawn down to the optimum level on the soil test, at which point in time fertilizer can be applied to maintain the optimum level on the soil test. The fertilizer application rate recommended on the soil test report will be used to apply the correct amount of fertilizer necessary to maintain the optimum level.
5. **Soil Sampling.** Soil sampling will be completed on a 4 year schedule to monitor the nutrients and maintain them at a level no higher than the optimum range. The soil tests will be used to prescribe the correct fertilizer rate and composition. Fields will be divided into approximately 5 acre sections. One composite sample will be taken from each section. The sample will be comprised of not less than 10 cores taken in the traditional "W" pattern. Composite samples will be sent to the UW Soil & Forage Analysis Lab in Medford. Fields with multiple composite samples will be averaged to make the recommendations. For a detailed description of the sampling procedure refer to UW Extension Bulletin A2809.
6. **Inspection** is vital to successful management. As previously stated, the frequency of inspection during the seeding year shall be monthly during the growing season. The following inspection and reporting procedure shall be used:
    - **Monthly Reporting (<u>seeding year</u>)** - Each month the Soil Conservationist or Engineer shall file the report with the Clerk assuring that the management practices installed are being maintained in a manner consistent with the WQT plan. Complete the form found on page 4. Additionally, the Operator shall make a statement, as a comment, on the monthly

discharge report certifying that management practices established are in good condition and properly maintained. This monthly update will also be used to record the following:

  - Harvest dates
  - Approximate hay yields to determine nutrient removal rate

- **Quarterly Reporting (<u>second year</u>)** Quarterly reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Semi-Annual Reporting (<u>third year and beyond</u>)** Semi-annual reporting, using the Form on page 4, shall be completed by the Soil Conservationist or Engineer, and the report filed with the City Clerk. Additionally, the Operator shall continue to make a statement, as a comment, on the monthly discharge report certifying that management practices established are in good condition and properly maintained.
- **Notification of Problems with Permanent Grass Cover -** The City shall notify the DNR within 7 days of becoming aware that the phosphorus reduction credits used by the City are not being generated as approved in the WQT Plan. The City will work to restore the vegetative cover and update the DNR on the progress of corrective measures.

**WATER QUALITY TRADING INSPECTION FORM**
**FOR THE CITY OF GREENWOOD**
**LOCATION: THE W1/2 - SE ¼, SECTION 33, T.27N. – R.2W.**

Date: _____ Inspector: _____ Weather: _____

Inspection Frequency (circle one): Monthly Quarterly Semi-Annual
Practice compliance (check appropriate box)
Seeding year ☐
Photo taken ☐
Established perennial hay crop ☐
Summary of findings:

_____
_____
_____
_____
_____

Identification of Items of non-compliance:

_____
_____
_____

Corrective measures required:

_____
_____
_____

Notice of **non-compliance** to the DNR required: Yes: _____ No: _____
Phosphorus credits used by City (annual report only): _____
Phosphorus credits available (annual report only): _____
Phosphorus credits deductions for failed practice

| Field # | Failed practice & reason | Credit Deduction |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

| FIELD # WHERE PHOTO WAS TAKEN | # OF PHOTOS TAKEN | GENERAL CONDITION OF FIELD |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

ATTACHMENT I

State of Wisconsin
Department of Natural Resources
101 South Webster Street
Madison WI 53707-7921
dnr.wi.gov

# Water Quality Trading Checklist

Form 3400-208 (1/14)



**Notice:** Pursuant to s. 283.84, Wis. Stats., this form must be completed by any WPDES permittee that intends to pursue pollutant trading as a method of complying with a permit limitation. Failure to complete this form would not result in penalties. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

## Applicant Information

| Permittee Name | Permit Number | Facility Site Number |
|---|---|---|
| City of Greenwood | WI- 020249-09 | |

| Facility Address | City | State | ZIP Code |
|---|---|---|---|
| Clearwater Drive | Greenwood | WI | 54437 |

| Project Contact Name (if applicable) | Address | City | State | ZIP Code |
|---|---|---|---|---|
| Kayla Schar | 102 N. Main Street | Greenwood | WI | 54437 |

Project Name

| Receiving Water Name | Parameter(s) being traded | HUC 12(s) |
|---|---|---|
| Black River | Phosphorus | 070400070405 |

## Credit Generator Information

Credit generator type (select all that apply):

- ☐ Permitted Discharge (non-MS4CAFO)
- ☐ Permitted MS4
- ☐ Permitted CAFO
- ☐ Urban nonpoint source discharge
- ☒ Agricultural nonpoint source discharge
- ☐ Other - Specify:

Are any of the credit generators in a different HUC 12 than the applicant? ◉ Yes; HUC 12: See Attachment A ○ No

Are any of the credit generators downstream of the applicant? ◉ Yes ○ No

Will a broker/exchange be used to facilitate trade? ○ Yes *(include description and contact information in WQT plan)* ◉ No

## Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO)

Are each of the point source credit generators identified in this section in compliance with their WDPES permit requirements? ○ Yes ○ No

| Discharge Type | Permit Number | Name | Contact Information | Trade Agreement Number |
|---|---|---|---|---|
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |
| ○ Traditional ○ MS4 ○ CAFO | | | | |

**Point to Point Trades (Traditional Municipal / Industrial, MS4, CAFO) *cont.***

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Summary of discharge and existing treatment including optimization | ○ Yes | ○ No | |
| b. Amount of credit being generated | ○ Yes | ○ No | |
| c. Timeline for credits and agreements | ○ Yes | ○ No | |
| d. Method for quantifying credits | ○ Yes | ○ No | |
| e. Tracking and verification procedures | ○ Yes | ○ No | |
| f. Location of credit generator in proximity to receiving water and credit user | ○ Yes | ○ No | |
| g. Other: _____ | ○ Yes | ○ No | |

**Point to Nonpoint Trades (Non-Permitted Urban, Agricultural, Other)**

| Discharge Type | Practices Used to Generate Credits | Method of Quantification | Trade Agreement Number | Have the practice(s) been formally registered? |
|---|---|---|---|---|
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Filter/Buffer strips<br>NoTill/Reduced Tillage | SnapPlus | Section C1 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C2 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>◉ Agricultural NPS<br>○ Other | Conservation Easement/Perennial Vegetation | SnapPlus | Section C3 | ◉ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |
| ○ Urban NPS<br>○ Agricultural NPS<br>○ Other | | | | ○ Yes<br>○ No<br>○ Only in part |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| a. Description of existing land uses | ◉ Yes | ○ No | |
| b. Management practices used to generate credits | ◉ Yes | ○ No | |
| c. Amount of credit being generated | ◉ Yes | ○ No | |
| d. Description of applicable trade ratio per agreement/management practice | ◉ Yes | ○ No | |
| e. Location where credits will be generated | ◉ Yes | ○ No | |
| f. Timeline for credits and agreements | ◉ Yes | ○ No | |
| g. Method for quantifying credits | ◉ Yes | ○ No | |

| Does plan have a narrative that describes: | | | Plan Section |
|---|---|---|---|
| h. Tracking procedures | ◉ Yes | ○ No | |
| i. Conditions under which the management practices may be inspected | ◉ Yes | ○ No | |
| j. Reporting requirements should the management practice fail | ◉ Yes | ○ No | |
| k. Operation and maintenance plan for each management practice | ◉ Yes | ○ No | |
| l. Location of credit generator in proximity to receiving water and credit user | ◉ Yes | ○ No | |
| m. Practice registration documents, if available | ◉ Yes | ○ No | |
| n. History of project site(s) | ◉ Yes | ○ No | |
| o. Other: _____ | ○ Yes | ○ No | |

**The preparer certifies all of the following:**

- I am familiar with the specifications submitted for this application, and I believe all applicable items in this checklist have been addressed.
- I have completed this document to the best of my knowledge and have not excluded pertinent information.
- I certify that the information in this document is true to the best of my knowledge.

| Signature of Preparer | Date Signed |
|---|---|
| Tony Latham | 2·21·19 |

**Authorized Representative Signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision. Based on my inquiry of those persons directly responsible for gathering and entering the information, the information is, to the best of my knowledge and belief, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature of Authorized Representative | Date Signed |
|---|---|
| Kayla Arnaz | 2/22/2019 |

**SUDA**
**ATTACHMENT J**

**Certification of Section C-3 of The Water Quality Trading Plan**

The undersigned hereby certifies that this water Quality Trading Plan is accurate and correct to the best of my knowledge and belief.

City of Greenwood:

Kayla Schar

Kayla Schar, City Clerk

Project Engineer:

Larry Gotham

Larry Gotham P.E., Morgan & Parmley Ltd.