



202 South Highway 86
Lakefield, MN 56150
507.662.5005 phone
507.662.5105 fax
info@extendedag.com

March 24, 2026

Environmental Land Management
1602 11th Drive NE
Austin, MN 55912

RE: Eagle Grove Cooperative-Eagle Grove, IA Permit # 99-SDP-06-19

The following is an agronomic review of waste products applied from the Eagle Grove Cooperative-Eagle Grove, IA facility. Waste was applied in the 2025 crop year. A brief description of the regulated waste product will be given to provide context of the review and a brief discussion of the land application sites, application rates and site characteristics will be done as well.

Product Description:

The Eagle Grove Cooperative is permitted to apply up to 7.0 wet tons (2.3 dry tons) per acre per year on the permitted land application site(s). Based on the most recent review of the material from February of 2025, an application of rate of approximately 2.3 dry tons per acre (the average rate applied in the scope of this review) will supply about 112 pounds of available nitrogen (N). It also contains about 173 pounds of P₂O₅. The organic nitrogen in the product will be slowly converted to plant available nitrate as soil microbes convert it – thus, its availability will depend on numerous environmental conditions including, soil temperature, moisture, drainage and pH. This should not result in any negative impacts soil sodicity. It should be noted that the product does not contain significant levels of arsenic, lead or mercury.

A corn crop with a yield of 200 bushels per acre will require approximately 180-190 pounds of nitrogen and will remove about 64 pounds of phosphorus and 44 pounds of potassium per acre. A soybean crop with a yield of 50 bushels per acre will require approximately 190 pounds of nitrogen (fixed on its own), 36 pounds of phosphorus and 60 pounds of potassium per acre each year. From an agronomic perspective, soil fertility in the high range is preferred. This translates to ±21 ppm for phosphorus using the Mehlich test and ±180 ppm for Potassium (dried). The opinion in this review will be based on characteristics and rates of the applied waste product, current soil tests and land application site conditions.

Site	Permitted Acres	Acres Applied	Rate	Dry Tons	By Product	Application Period
Harmon Newark Troy 12-7	300	300	1.9	584.6	Industrial Sludge	4th Quarter
Harmon Wagner	155	118	1.2	137	Industrial Sludge	4th Quarter
Harmon Troy 14	228	197	2.2	430.5	Industrial Sludge	4th Quarter
Durschmidt Hammer	189	189	2.0	383.3	Industrial Sludge	1st Quarter
Harmon Troy 17-18	227	120	1.6	193	Industrial Sludge	1st Quarter

The fields used for land application were evaluated for soil phosphorus levels, salts and soil pH. Farms with a soil pH below 6.0 should receive an application of agricultural lime. Salt levels should be managed to maintain levels below 1.0. Fields with a phosphorus level exceeding 31 ppm in the Mehlich P should be managed so that fertility levels do not increase, thus applying nutrients at crop removal rates. A summary of field characteristics is shown below – site specific discussion follows:

Farmer	Site	pH	MEH-3 P	Salts	Net P2O5	Net K2O
Sean Harmon	Harmon Newark Troy 12-7	5.7	34	0.3	83	-41
Sean Harmon	Harmon Wagner	5.9	44	0.4	13	-50
Sean Harmon	Harmon Troy 14	5.8	36	0.3	95	-44
Jason Durschmidt	Durschmidt Hammer	6.3	15	0.4	81	-46
Sean Harmon	Harmon Troy 17-18	6.4	28	0.3	56	-42

Land Application Sites for 2025 Crop Year:

Harmon Newark Troy 12-7: This farm received 584.6 dry tons of product applied on approximately 300 acres in the 4th Quarter of the 2024-2025 crop year. A single by-product source was applied to the acres. A reported Corn yield of 202 Bushels per acre was harvested on the farm. Based on this yield, approximately 65 lbs. of P₂O₅ and 44 lbs. of K₂O were removed. Soil test results show that the organic matter levels are approximately 4.9%, the phosphorus ranges from a minimum of 14 and a max of 59 with an average of 34 ppm; the Very High range according to Iowa State University. Soil potassium averages 155 ppm; the Low range according to Iowa State University. Based on the cumulative application rate and reported crop yields, a net of 83 lbs of P₂O₅ and -41 lbs of K₂O are calculated on these acres. Average soil pH is 5.7 - Very Acidic and should be treated with agricultural lime to raise the pH to 6.5. Reported salt (EC) levels are 0.3 mhoms/dm and there are no concerns related to current measured salt levels.

Harmon Wagner: This farm received 137.3 dry tons of product applied on approximately 118 acres in the 4th Quarter of the 2024-2025 crop year. A single by-product source was applied to the acres. A reported Corn yield of 237 Bushels per acre was harvested on the farm. Based on this yield, approximately 76 lbs. of P₂O₅ and 52 lbs. of K₂O were removed. Soil test results show that the organic matter levels are approximately 4.8%, the phosphorus ranges from a minimum of 35 and a max of 52 with an average of 44 ppm; the Very High range according to Iowa State University. Soil potassium averages 216 ppm; the High range according to Iowa State University. Based on the cumulative application rate and reported crop yields, a net of 13 lbs of P₂O₅ and -50 lbs of K₂O are calculated on these acres. Average soil pH is 5.8 - Very Acidic and should be treated with agricultural lime to raise the pH to 6.5. Reported salt (EC) levels are 0.4 mhoms/dm and there are no concerns related to current measured salt levels.

Harmon Troy 14: This farm received 430.5 dry tons of product applied on approximately 197 acres in the 4th Quarter of the 2024-2025 crop year. A single by-product source was applied to the acres. A reported Corn yield of 222 Bushels per acre was harvested on the farm. Based on this yield, approximately 71 lbs. of P₂O₅ and 49 lbs. of K₂O were removed. Soil test results show that the organic matter levels are approximately 4.4%, the phosphorus ranges from a minimum of 16 and a max of 66 with an average of 36 ppm; the Very High range according to Iowa State University. Soil potassium averages 171 ppm; the Optimum range according to Iowa State University. Based on the cumulative application rate and reported crop yields, a net of 95 lbs of P₂O₅ and -44 lbs of K₂O are calculated on these acres. Average soil pH is 5.8 - Very Acidic and should be treated with agricultural lime to raise the pH to 6.5. Reported salt (EC) levels are 0.3 mhoms/dm and there are no concerns related to current measured salt levels.

Durschmidt Hammer: This farm received 383.3 dry tons of product applied on approximately 189 acres in the 1st Quarter of the 2024-2025 crop year. A single by-product source was applied to the acres. A reported Corn yield of 227 Bushels per acre was harvested on the farm. Based on this yield, approximately 73 lbs. of P₂O₅ and 50 lbs. of K₂O were removed. Soil test results show that the organic matter levels are approximately 4.4%, the phosphorus ranges from a minimum of 12 and a max of 26 with an average of 15 ppm; the Low range according to Iowa State University. Soil potassium averages

165 ppm; the Optimum range according to Iowa State University. Based on the cumulative application rate and reported crop yields, a net of 81 lbs of P₂O₅ and -46 lbs of K₂O are calculated on these acres. Average soil pH is 6.3 - Slightly Acidic and should be monitored to maintain soil pH near 6.5. Reported salt (EC) levels are 0.4 mhoms/dm and there are no concerns related to current measured salt levels.

Harmon Troy 17-18: This farm received 193 dry tons of product applied on approximately 120 acres in the 1st Quarter of the 2024-2025 crop year. A single by-product source was applied to the acres. A reported Corn yield of 207 Bushels per acre was harvested on the farm. Based on this yield, approximately 66 lbs. of P₂O₅ and 46 lbs. of K₂O were removed. Soil test results show that the organic matter levels are approximately 4.8%, the phosphorus ranges from a minimum of 14 and a max of 36 with an average of 28 ppm; the High range according to Iowa State University. Soil potassium averages 180 ppm; the Optimum range according to Iowa State University. Based on the cumulative application rate and reported crop yields, a net of 56 lbs of P₂O₅ and -42 lbs of K₂O are calculated on these acres. Average soil pH is 6.4 - Slightly Acidic and should be monitored to maintain soil pH near 6.5. Reported salt (EC) levels are 0.3 mhoms/dm and there are no concerns related to current measured salt levels.

Soil phosphorus and applied nitrogen are the primary nutrients of concern to water quality and public health. The reported rates of Nitrogen do not pose a risk to water quality. The applied phosphorus rates in conjunction with the reported soil phosphorus levels do not pose a significant risk to environmental quality or public health. Applied rates of Sodium should be monitored to ensure that sodicity of soils is not increased. If necessary, added calcium (gypsum) can be used to ensure a proper ratio of calcium, magnesium and sodium is preserved to protect soil health, structure and water infiltration. The reported rates are not likely to negatively impact soil SAR. Best management practices in nutrient management and land application should always be followed.

Regards,



Jim Nesseth
Certified Agronomist
License #: 17118



Andrew Nesseth
Environmental Consultant