12.0 STORMWATER

James W. Sewall Company (Sewall) has developed, as part of the turbine site and road plans, this comprehensive stormwater management and control plan for the project.

In general, the stormwater control plan is designed to minimize the concentration of stormwater flows off the project site. The primary components of the plan include minimizing areas permanently impacted by the project and incorporating appropriate Best Management Practices (BMPs) into the project design.

A large component of stormwater management includes minimizing the permanent impacts associated with the project through systematic revegetation of disturbed areas. Turbine clearing areas will be stabilized and allowed to revegetate with the exception of the following: a 40-foot radius around the base of each turbine; 75-foot by 120-foot crane pads at each turbine; and a short 24-foot wide access drive to each of the crane pads.

Impacts to site hydrology from the proposed project will also be minimized by the use of appropriate stormwater management BMPs, such as culverts with outlet protection and level spreaders. In areas where ditches are required (primarily in areas of cut), they will outlet to stone bermed level lip spreaders or to traditional level spreaders as suggested by the MDEP design criteria. Through proper installation and maintenance of BMPs, no significant water quality impacts to the watersheds will occur.

12.1 METHODOLOGY

Criteria used to establish a viable stormwater management scheme were as follows:

- Maintain existing flow paths and discharge points to the extent possible;
- Maintain current runoff curve numbers for all watersheds;
- Provide MDEP prescribed levels of water quality treatment for the developed area; and
- Avoid disturbance of existing wetlands to the maximum extent practicable.

The runoff curve numbers (CNs) determined by ground cover and soil types (Section 11.0 - Soils), were calculated to compare the pre- and post-development conditions. Soils found on the site were predominantly Hydrologic Group C soils. Existing roads were not included in the CN calculations. Existing roads will remain the same in both the pre- and post-development conditions and therefore will not affect the outcome of the calculations.

12.2 MODELING ASSUMPTIONS

The pre-development watershed study assumes an undeveloped site.

12.3 ALTERATIONS TO LAND COVER

Alterations to land cover will be consistent with development of the wind energy facility and access roads. Developed areas of existing roads will be regraded, and final road and project surface areas will consist

of gravel roads and turbine areas. In areas where existing roads are in close proximity to natural resources, roadway widths will remain as is.

12.4 EXISTING CONDITIONS

Land cover within the project area consists primarily of secondary deciduous, coniferous, and mixed deciduous/coniferous forest. There is also a network of existing gravel roads within the project area. The project watershed is divided into two sub-areas draining to various locations. Both sub-areas are within lake watersheds, including Spectacle Pond, and Graham Lake.

12.5 PROPOSED CONDITIONS

Alterations associated with the post-development conditions consist of gravel roads and gravel turbine pad areas.

The post-development watershed for project was also divided into two sub-catchments. The relative amount of disturbance from the development in each watershed was minimal. The drainage areas were the same in the pre- and post-development conditions. The curve number calculations were adjusted to add the different land cover (gravel) associated with the proposed development. No changes in the curve numbers were noted, therefore there were no changes in the runoff as a result of the proposed project. See the attached calculations in Exhibit 12-1.

12.6 SUMMARY

See the table in Exhibit 12-1 for the summarized results of pre-development and post-development CN calculations for the project area. There was no change in curve numbers from pre-development to post-development conditions.

12.7 CONCLUSIONS

Based upon results of the above analysis, no increase in discharge rate from the project area will be created. No adverse impact to adjacent waterbodies and/or properties will occur upon the implementation of stormwater management schemes depicted on referenced drainage plans.

Attached as Exhibit 12-1 are the CN calculations.

12.8 PHOSPHOROUS ANALYSIS

There are two lake watersheds for the Weaver Wind Project: Spectacle Pond (Eastbrook, T22MD and Osborn) and Graham Lake. The following describes the phosphorus loading for the lake watersheds. See the attached calculations in Exhibit 12-2.

The phosphorus analysis is based on several assumptions listed in this narrative, support calculations and specific analytical methods described in *Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development* (MDEP, January 2008). Data on current water quality and allowable loading for Spectacle Pond and Graham Lake were obtained from MDEP. See the attached phosphorous calculations in Exhibit 12-2 for the phosphorous allocations, small watershed thresholds, and the phosphorous budget for the lake watersheds.

The phosphorous budget for Spectacle Pond Watershed in Osborn was calculated using the given phosphorous budget (P value) and by selecting a development area of 208.34 acres for the watershed.[1] Based on this, a Project Phosphorus Budget (PPB) of 14.5840 pounds/year was calculated. The post-development calculation on the attached spreadsheet (Exhibit 12-2) was prepared using a permanent gravel area of 15.96 acres of gravel roads and crane pads that will remain on the site once revegetation occurs. The calculations demonstrate that the currently proposed development will result in a phosphorus loading of 13.9395 pounds/year, which is less than the 14.5840 pounds/year PPB.

The phosphorous budget for Spectacle Pond Watershed in Eastbrook was calculated using the given P value and by selecting a development area of 203.76 acres for the watershed[1]. Based on this, a PPB of 3.4722 pounds/year was calculated. The post-development calculation on the attached spreadsheet in Exhibit 12-2 was prepared using a permanent gravel area of 6.71 acres of gravel roads and crane pads that will remain on the site once revegetation occurs. The calculations demonstrate that the currently proposed development will result in a phosphorus loading of 3.4341 pounds/year, which is less than the 3.4722 pounds/year PPB.

The phosphorous budget for Spectacle Pond Watershed in T22MD was calculated using the given P value and by selecting a development area of 1.73 acres for the watershed[1]. Based on this, a PPB of 0.1261 pounds/year was calculated. The post-development calculation on the attached spreadsheet in Exhibit 12-2 was prepared using a permanent gravel area of 0.07 acres of road widening for the Stone Dam Road for the turbine transportation that will remain impervious. The calculations demonstrate that the currently proposed development will result in a phosphorus loading of 0.1181 pounds/year, which is less than the 0.1261 pounds/year PPB.

According to MDEP, Graham Lake is an exception to the phosphorous standards because its algal productivity is not currently limited by phosphorus. Graham Lake is a large, fairly shallow, man-made lake with substantial water level fluctuation. The water level in Graham Lake is drawn down fairly often. During such periods in windy conditions, bottom sediments, particularly in the large Union River delta in the north half of the lake, are suspended, and the lake becomes murky. Secchi disc readings are often less than two meters, but chlorophyll concentrations indicate very low algal productivity because suspended sediment limits light penetration and therefore limits algal production. Because of this, the phosphorus standard is not applicable. The runoff from the Graham Lake Watershed is required to meet the general standards, which requires 75% of the linear portion of the development be treated. Within this watershed, 17.19 acres of new impervious surface is being proposed in this watershed, and 85.03% of stormwater runoff is being treated through a combination of buffers.

Phosphorus treatment will be accomplished by extensive forest and meadow roadside buffering (see deed restriction forms, Exhibit 12-3 and Exhibit 12-4). The deed restriction language is based on the standard forms with minor adjustments specific to the project, and that will ensure the buffers function for their intended purposes. The forms are consistent with forms approved by MDEP in prior wind power projects.

The road surface runoff will be treated either by sheet-flow roadside buffers or by buffers with stone bermed level spreaders. Typically, forested or meadow roadside buffers will be established wherever grading will permit sheet flow runoff from the access and crane path roads. Where sheet flow is not

[1] The “development” area is an area that was chosen around the project to determine the allowable phosphorous budget within the lake watersheds. The development area is shown on the design plans.

possible, stormwater running off the roads will be collected in ditches on the downhill side of the roads. These ditches will then be periodically discharged downhill via buffers with stone bermed level spreaders. Buffers will also be utilized around the turbine pads.

In addition to stormwater buffer restriction, future development will be prohibited in the phosphorous development area as depicted on the civil design plans. However, general forestry practices as outlined in the Maine Forest Practices Act may continue within the phosphorous development area.

12.9 MAINTENANCE OF COMMON FACILITIES OR PROPERTY

Facilities requiring regular maintenance at the project include the stormwater management system, roads and turbine pads. Following are the maintenance requirements that will be included in this project.

The Applicant will be responsible for ensuring that maintenance activities are completed in a timely manner. During construction, the prime contractor will have this responsibility.

12.9.1 Long-term Maintenance Plan

At a minimum, inspect the following components two times annually on or about May 1 and November 1 and after severe storms:

1. **Ditches**

    a. Rip-rap Lined Ditches:

    - Inspect semi-annually;
    - Remove sediment buildup, leaves, litter, or other debris from the bottom and side slopes; and
    - Reposition stones to restore channel to original dimensions.

    b. Vegetated Ditches:

    - Inspect the ditch lining monthly for slumping of the lining, downcutting of the ditches base, or undercutting of the banks;
    - Repair any damage immediately; and
    - Mow or brush-cut annually to prevent the establishment of woody vegetation.

2. **Culverts**

    - Inspect for sediment buildup; and
    - Flush pipes and remove sediment when depth of sediment at any location in the pipe exceeds three inches.

3. **Rip-Rap Aprons, Level Spreaders, and Stone Bermed Level Lip Spreaders**

    - Inspect semi-annually or after severe storms for dislodged stones or slumping of the stone lining;

- Reposition stones to restore original dimensions of the pool and create a uniform surface;
- Clean any accumulated sediments and debris from the plunge pool; and
- Cut and remove any woody vegetation growing within the pool.

4. Vegetation

- Inspect vegetated areas each spring;
- Re-seed and mulch areas where cover is less than 90 percent; and
- Rework, seed, and mulch areas with spotty plant germination, sparse vegetation, or where soil erosion is evident.

5. Stones Check Dams

a. Prior to establishment of permanent vegetation:

- Inspect check dams after each storm event until permanent vegetation is established; and
- Remove sediment buildup behind check dams.

b. After establishment of permanent vegetation:

- Inspect for sediment build-up in void space between stones and dislodged stones;
- Remove sediment build-up;
- Seed and mulch disturbed areas;
- Replace check dams if sediment is filling void space; and
- Replace dislodged stones.

6. Road Grading

- Grade the road to maintain the proposed roadway crown or super elevation and to prevent the creation of berms or ruts that may channelize flow.

12.9.2 Minimum Annual Maintenance

1. Side Slopes of Gravel Surfaces

- Inspect slopes for rill erosion due to concentrated flows; and
- Replace topsoil and reseed eroded slopes.

2. Level Spreaders and Stone Bermed Level Lip Spreaders

- Inspect and verify that top of stone is level (+/- one inch);
- Repair level lip to distribute flows uniformly across the buffer;

- Inspect stone to verify that it remains clean and free of sediment and is in place as designed; and
- Remove sediments, replace any dislodged stone, and maintain lip level to disperse flows uniformly across the buffer area.

Inspection and Maintenance Log of Stormwater Structures

Month of _____, 20___

Structure	Date	Checked by	Comments

Exhibit 12-1

Curve Number Calculations

Project Name	**Weaver Wind**
Project Number	**84176E**
Date	10/23/2018
Done by	JAO

CN Value Calcs

Spectacle Pond

Condition	Wooded Area	CN Value Woods	Imp Area (acres)	CN Value Impervious	Total Area (acres)	Overall CN Value
Pre Development	3421.14	70		96	3421.14	70
Post Development	3398.40	70	22.74	96	3421.14	70

Graham Lake

Condition	Wooded Area (acres)	CN Value Woods	Imp Area (acres)	CN Value Impervious	Total Area (acres)	Overall CN Value
Pre Development	3236.79	70		96	3236.79	70
Post Development	3219.60	70	17.19	96	3236.79	70

Exhibit 12-2

Phosphorus Analysis

Project Name	**Weaver Wind**	BA=Buffer Adjacent to Small Imp	RB=Roadside buffer
Project Number	**84176E**	BL=Buffer w/level spreader	DB=Detention basin
Date	10/23/2018	DT=Buffer w/ditch turnout	WP=Wet pond
Done by	JAO	USF=Underdrain Soil Filter	INF=Infiltration

QUALITY CALCULATIONS FOR NON LINEAR PORTION

Total NEW NONLIN impervious area for project=	283465	sf	=	6.51	acres
Total NEW NONLIN landscaped area for project=	33187	sf	=	0.76	acres
Total NEW NONLINEAR area of project=	316652	sf	=	7.27	acres

		NONLinear Area		
Subcatchment #	**BMP Type & #**	**Imp (sf)**	**Land (sf)**	**Description If Applicable**
1	Substation Pad	68200	0	Previously Permitted
2	B27	17130	0	Previously Permitted
3	B28	7610	6908	Previously Permitted
4	BA	16056	7328	Previously Permitted
5	Substation Pad	133637	0	Weaver self treating gravel pad
6	B29	40144	0	New access road
	TOTAL	***282777***	***14236***	

SUMMARY FOR THE NONLINEAR PORTION OF THE PROJECT

IMP Area Required area to be treated (sf)=	269291.75		
Total NONLIN IMP Area Being Treated (sf)=	**282777**	***99.8%***	**>=95%**
DEVEL Area Required area to be treated (sf)=	253321.60		
Total NONLIN DEVEL Area Being Treated (sf)=	**297013**	***93.80%***	**>=80%**
NONLinear Area Not Being Treated (sf)=	19639		

Project Name	**Weaver Wind**	BA=Buffer Adjacent to Small Imp	RB=Roadside buffer	BRS=Roadside Buffer with Rock Sandwich
Project Number	**84176E**	BL=Buffer w/level spreader	DB=Detention basin	
Date	10/23/2018	DT=Buffer w/ditch turnout	WP=Wet pond	
Done by	JAO	USF=Underdrain Soil Filter	INF=Infiltration	

QUALITY CALCULATIONS FOR LINEAR PORTION

Graham Lake

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C):	P	N/A	# P/acre/year	Total ac of devel. parcel:	TA		acres
Small Watershed Threshold (Appendix C)	SWT		acres	NWI wetland acreage:	WA		acres
Allowable increase in Town's share of annual phos (App C)	FC		lbs P/year	Steep slope acreage:	SA		acres
Area avail. For development (App C)	AAD		acres	Existing imp area (Pre 1980)	EIA_B		acres
Project acreage: $A = TA - (WA + SA + EIA_B + EIA_A)$	A		acres	Existing imp area (post 1980)	EIA_A		acres
A/AAD	R						

Project Phos Budget: PPB = P x A	**PPB**	**N/A**	**lbs P/year**
Project Phos Budget with small watershed adjustment:	**PPB**	**N/A**	**lbs P/year**

Total Post Development Phos Export (lbs P/yr)=	**0.0000**	<=	**N/A**	Access rd width(Const)=	24	Crane path width(Const)=	39.5
% of Project Treated for WS=	**85.03%**	>=	75%	Access rd width(Perm)=	24	Crane path width(Perm)=	39.5
Total Impervious Area for WS=	17.19	Acres		Existing NC=	remain as is	Met Tower Rd width=	16

North String

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor
Access/Crane T20	Access	148	900	100%	NONE	BOTH		10	0.2417	0.4143	1
Access/Crane T20	Access	900	1085	100%	BL1	BOTH	Meadow	10	0.0595	0.1019	0.4
Access/Crane T20	Access	1085	1475	50%	BL2	LEFT	Forest	10	0.0627	0.1074	0.4
Access/Crane T20	Access	1085	1420	50%	BL3	RIGHT	Forest	10	0.0538	0.0923	0.4
MET PMT20	Met	120000	120080	50%	BL2	LEFT	Forest		0.0147	0.0147	0.4
MET PMT20	Met	120000	120080	50%	BL4	RIGHT	Forest		0.0147	0.0147	0.4
MET PMT20	Met	120080	120314	100%	NONE				0.0860	0.0860	1
Access/Crane T20	Access	1420	1475	50%	RB1	RIGHT	Forest	10	0.0088	0.0152	0.4

Access/Crane T20	Access	1475	1500	50%	BL4	RIGHT	Forest	10	0.0040	0.0069	0.4
Access/Crane T20	Access	1500	1580	50%	RB2	RIGHT	Meadow	10	0.0129	0.0220	0.4
Access/Crane T20	Access	1475	1650	50%	BL4	LEFT	Forest	10	0.0281	0.0482	0.4
Access/Crane T20	Crane	1580	1640	50%	NONE	RIGHT		10	0.0203	0.0272	1
Access/Crane T20	Crane	1640	2100	50%	RB2B	RIGHT	Meadow	10	0.1558	0.2086	0.4
Access/Crane T20	Crane	1650	1825	100%	BL4	LEFT	Forest	10	0.1185	0.1587	0.4
Access/Crane T20	Crane	1825	2050	50%	BL4	LEFT	Forest	10	0.0762	0.1020	0.4
Access/Crane T20	Crane	2050	2450	50%	BL5	LEFT	Forest	10	0.1354	0.1814	0.4
Access/Crane T20	Crane	2100	2450	50%	BL6	RIGHT	Meadow	10	0.1185	0.1587	0.4
Access/Crane T20	Crane	2450	2570	100%	B20	BOTH	Forest	10	0.0813	0.1088	0.4
T20	Turbine			70%	B20		Forest		0.2878	0.2878	0.4
Access/Crane T23	Access	10050	10230	100%	NONE	BOTH		10	0.0579	0.0992	1
Access/Crane T23	Access	10230	10700	100%	BL7	BOTH	Forest	10	0.1511	0.2590	0.4
Access/Crane T23	Access	10700	10970	100%	BL8	BOTH	Forest	10	0.0868	0.1488	0.4
Access/Crane T23	Access	10970	11500	50%	BL9	LEFT	Forest	10	0.0852	0.1460	0.4
Access/Crane T23	Crane	11500	11800	50%	BL9	LEFT	Forest		0.1360	0.1360	0.4
Access/Crane T23	Access	10970	11040	50%	BL9	RIGHT	Forest		0.0193	0.0193	0.4
Access/Crane T23	Access	11040	11175	50%	RB3	RIGHT	Forest		0.0372	0.0372	0.4
MET PMT22/23	Met	121915	122000	100%	NONE	BOTH			0.0312	0.0312	1
MET PMT22/23	Met	122000	122560	50%	BL58	LEFT	Forest		0.1028	0.1028	0.4
MET PMT22/23	Met	122560	122811	50%	BL59	LEFT	Meadow		0.0461	0.0461	0.4
MET PMT22/23	Met	122000	122811	50%	NONE	RIGHT			0.1489	0.1489	1
MET PMT22/23	Laydown			100%	BL59		Meadow		0.1102	0.1102	0.4
T22	Turbine			50%	BL9				0.3121	0.3121	0.4
Access/Crane T24	Access	24063	24180	100%	NONE	BOTH		10	0.0376	0.0645	1
Access/Crane T24	Access	24180	24200	50%	BL17	RIGHT	Forest	10	0.0032	0.0055	0.4
Access/Crane T24	Access	24200	24400	50%	RB7	RIGHT	Forest	10	0.0321	0.0551	0.4
Access/Crane T24	Access	24400	24700	50%	RB7	RIGHT	Forest		0.0826	0.0826	0.4
Access/Crane T24	Access	24180	24200	50%	NONE	LEFT		10	0.0032	0.0055	1
Access/Crane T24	Access	24200	24400	50%	BL17	LEFT	Forest	10	0.0321	0.0551	0.4
Access/Crane T24	Access	24400	24725	50%	BL17	LEFT	Forest		0.0895	0.0895	0.4
Access/Crane T24	Access	24700	24725	50%	BL18	RIGHT	Forest	10	0.0040	0.0069	0.4
Access/Crane T24	Access	24725	25150	100%	BL18	BOTH	Forest	10	0.1366	0.2342	0.4
Access/Crane T24	Access	25150	25550	100%	BL19	BOTH	Forest	10	0.1286	0.2204	0.4
Access/Crane T24	Access	25550	26125	100%	BL20	BOTH	Meadow	10	0.1848	0.3168	0.4
Access/Crane T24	Access	26125	26450	100%	BL21	BOTH	Forest	10	0.1045	0.1791	0.4
Access/Crane T24	Crane	26450	26500	100%	BL21	BOTH	Forest		0.0453	0.0453	0.4
Access/Crane T24	Crane	26500	26600	50%	B25	LEFT	Forest		0.0453	0.0453	0.4
T25	Turbine			50%	B25		Forest		0.3123	0.3123	0.4

5.4716

Weaver/Een Ridge

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor
T19	Turbine			25%	B19		Forest		0.3123	0.3123	0.4
Crane P Een Ridge	Crane	40250	40350	50%	B19	RIGHT	Forest		0.0453	0.0453	0.4
Crane P Een Ridge	Crane	40350	40900	50%	BL38	RIGHT	Forest		0.2494	0.2494	0.4
Crane P Een Ridge	Crane	40650	40900	50%	BL38	LEFT	Forest		0.1133	0.1133	0.4
Crane P Een Ridge	Crane	40900	41350	50%	BL39	RIGHT	Forest		0.2040	0.2040	0.4
Crane P Een Ridge	Crane	41350	41800	50%	BL40	RIGHT	Forest		0.2040	0.2040	0.4
Crane P Een Ridge	Crane	40900	41325	50%	BL39	LEFT	Forest		0.1927	0.1927	0.4
Crane P Een Ridge	Crane	41325	41800	50%	BL40	LEFT	Forest		0.2154	0.2154	0.4
Crane P Een Ridge	Crane	41800	42050	100%	BL41	BOTH	Forest		0.2267	0.2267	0.4
Crane P Een Ridge	Crane	42050	42300	50%	BL41	RIGHT	Forest		0.1133	0.1133	0.4
Crane P Een Ridge	Crane	42050	42175	50%	RB12	LEFT	Forest		0.0567	0.0567	0.4
Crane P Een Ridge	Crane	42500	42900	50%	BL43	RIGHT	Forest		0.1814	0.1814	0.4
Crane P Een Ridge	Crane	42900	43050	50%	BL43	RIGHT	Forest	10	0.0508	0.0680	0.4
Crane P Een Ridge	Crane	42510	42900	50%	BL43	LEFT	Forest		0.1768	0.1768	0.4
Crane P Een Ridge	Crane	42900	42950	50%	BL43	LEFT	Forest	10	0.0169	0.0227	0.4
Crane P Een Ridge	Crane	43050	43100	50%	RB14	RIGHT	Forest		0.0227	0.0227	0.4
Crane P Een Ridge	Crane	43100	43200	50%	RB14	RIGHT	Forest	10	0.0339	0.0453	0.4
Weaver Access Rd	Access	53800	54075	50%	RB21	RIGHT	Forest	14	0.0316	0.0758	0.4
Weaver Access Rd	Access	54075	54140	50%	NONE	Right		14	0.0075	0.0179	1
Weaver Access Rd	Access	53800	54500	50%	BL49	LEFT	Meadow	14	0.0803	0.1928	0.4
Weaver Access Rd	Access	54140	54150	50%	BL49	RIGHT	Meadow	14	0.0011	0.0028	0.4
Weaver Access Rd	Access	54150	54250	50%	RB22	RIGHT	Forest	14	0.0115	0.0275	0.4
Weaver Access Rd	Access	54250	54500	50%	BL50	RIGHT	Meadow	14	0.0287	0.0689	0.4
Weaver Access Rd	Access	54500	54700	100%	BL51	BOTH	Meadow	14	0.0459	0.1102	0.4
Weaver Access Rd	Access	54700	54846	100%	NONE	BOTH		14	0.0335	0.0804	1
Weaver Crane Path	Crane	60000	60475	50%	NONE	LEFT			0.2154	0.2154	1
Weaver Crane Path	Crane	60000	60110	50%	NONE	RIGHT			0.0499	0.0499	1
Weaver Crane Path	Crane	60110	60400	50%	NONE	RIGHT			0.1315	0.1315	1
Weaver Crane Path	Crane	60400	60600	50%	NONE	RIGHT	Forest		0.0907	0.0907	1
T16	Turbine			100%	NONE		Forest		0.3123	0.3123	1
Weaver Crane Path	Crane	60600	61250	50%	BL52	RIGHT	Forest		0.2947	0.2947	0.4
Weaver Crane Path	Crane	61200	62100	50%	BL54	LEFT	Forest		0.4081	0.4081	0.4
Weaver Crane Path	Crane	61250	61500	50%	BL54	RIGHT	Forest		0.1133	0.1133	0.4
Weaver Crane Path	Crane	61500	61650	50%	B15	RIGHT	Forest		0.0680	0.0680	0.4
MET PMT15/16	Met	115020	115350	100%	BL52	BOTH	Forest		0.1212	0.1212	0.4
MET PMT15/16	Met	115350	115500	50%	BL52	RIGHT	Forest		0.0275	0.0275	0.4
MET PMT15/16	Met	115500	116026	50%	BL60	RIGHT	Meadow		0.0966	0.0966	0.4
MET PMT15/16	Met	115350	116026	50%	BL60	LEFT	Meadow		0.1242	0.1242	0.4
T15	Turbine			100%	B15		Forest		0.3113	0.3113	0.4
Weaver Crane Path	Crane	61650	62275	50%	BL55	RIGHT	Forest		0.2834	0.2834	0.4

Weaver Crane Path	Crane	62275	62767	50%	BL56	RIGHT	Forest		0.2231	0.2231	0.4	
Weaver Crane Path	Crane	62100	62275	50%	BL55	LEFT	Forest		0.0793	0.0793	0.4	
Weaver Crane Path	Crane	62275	62700	50%	BL57	LEFT	Meadow		0.1927	0.1927	0.4	
Weaver Crane Path	Crane	62700	62767	50%	NONE	LEFT			0.0304	0.0304	1	
T14	Turbine			50%	BL56		Forest		0.2878	0.2878	0.4	
T14	Turbine			50%	NONE		Forest		0.2878	0.2878	1	
MET PMT14	Met	114000	114100	100%	NONE	BOTH		10	0.0367	0.0597	1	
MET PMT14	Met	114100	114500	100%	BL105	BOTH	Forest	10	0.1469	0.2388	0.4	
MET PMT14	Met	114500	114975	100%	BL106	BOTH	Forest	10	0.1745	0.2835	0.4	
MET PMT14	Met	114975	115475	100%	BL106	BOTH	Forest		0.1837	0.1837	0.4	
MET PMT14	Met	115475	115680	100%	NONE	BOTH			0.0753	0.0753	1	7.6164

Little Bull Hill West

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	
T4	Turbine			50%	BL75		Forest		0.3121	0.3121	0.4	
T3	Turbine			100%	B3		Forest		0.2878	0.2878	0.4	
LBHW	Crane	76132	76225	100%	B3	BOTH	Forest		0.0843	0.0843	0.4	
LBHW	Crane	76225	76530	50%	BL71	LEFT	Forest		0.1383	0.1383	0.4	
LBHW	Crane	76530	76850	50%	BL73	LEFT	Meadow		0.1451	0.1451	0.4	
LBHW	Crane	76850	77075	50%	RB34	LEFT	Forest		0.1020	0.1020	0.4	
LBHW	Crane	77075	77200	50%	NONE	LEFT			0.0567	0.0567	1	
LBHW	Crane	76225	76700	50%	BL72	RIGHT	Forest		0.2154	0.2154	0.4	
LBHW	Crane	76700	76885	50%	BL74	RIGHT	Meadow		0.0839	0.0839	0.4	
LBHW	Crane	76885	77200	50%	BL75	RIGHT	Forest		0.1428	0.1428	0.4	1.5683

Little Bull Hill

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor
LBH T6	Access	81400	81700	100%	BL78	BOTH	Forest	15	0.0620	0.1653	0.4
LBH T6	Access	81700	82000	100%	BL79	LEFT	Forest	15	0.0620	0.1653	0.4
LBH T6	Access	81700	81875	50%	BL79	RIGHT	Forest	15	0.0181	0.0482	0.4
LBH T6	Access	81875	82000	50%	BL80	RIGHT	Forest	15	0.0129	0.0344	0.4
LBH T6	Existing NC	82000	82050	50%		Remain As Is		15	0.0000	0.0000	1
LBH T6	Access	82050	82175	50%	RB35	RIGHT	Forest	15	0.0129	0.0344	0.4
LBH T6	Access	82175	82210	50%	NONE	RIGHT		15	0.0036	0.0096	1

LBH T6	Access	82210	82250	50%	RB36	RIGHT	Meadow	15	0.0041	0.0110	0.4
LBH T6	Access	82250	82750	50%	RB36	RIGHT	Meadow		0.1377	0.1377	0.4
LBH T6	Transport Widen	82225	82600	100%	RB36	RIGHT	Meadow		0.2494	0.2494	0.4
LBH T6	Access	82000	82250	50%	BL80	LEFT	Forest	15	0.0258	0.0689	0.4
LBH T6	Access	82250	82500	50%	BL80	LEFT	Forest		0.0689	0.0689	0.4
LBH T6	Access	82500	82750	50%	BL81	LEFT	Forest		0.0689	0.0689	0.4
LBH T6	Access	82750	83150	50%	BL82	RIGHT	Meadow		0.1102	0.1102	0.4
LBH T6	Access	82750	83150	50%	BL83	LEFT	Forest		0.1102	0.1102	0.4
LBH T6	Access	83150	83275	100%	B6	BOTH	Forest		0.0689	0.0689	0.4
T6	Turbine			100%	B6		Forest		0.2878	0.2878	0.4
LBH T9	Access	85015	85225	50%	BL80	LEFT	Forest	18	0.0145	0.0579	0.4
LBH T9	Access	85015	85225	50%	BL81	RIGHT	Forest	18	0.0145	0.0579	0.4
LBH T9	Existing NC	85225	85500	100%		Remain As Is		18	0.0000	0.0000	1
LBH T9	Access	85500	85625	100%	NONE	BOTH		18	0.0172	0.0689	1
LBH T9	Access	85625	85700	100%	BL82B	BOTH	Forest	18	0.0103	0.0413	0.4
LBH T9	Access	85700	86050	100%	BL82B	BOTH	Forest		0.1928	0.1928	0.4
LBH T9	Crane	86050	86125	100%	BL82B	BOTH	Forest		0.0680	0.0680	0.4
LBH T9	Crane	86125	86450	50%	BL82B	LEFT	Forest		0.1474	0.1474	0.4
LBH T9	Crane	86125	86450	50%	B7	RIGHT	Forest		0.1474	0.1474	0.4
T7	Turbine			100%	B7		Forest		0.3123	0.3123	0.4
LBH T9	Crane	86450	86675	50%	BL83B	RIGHT	Forest		0.1020	0.1020	0.4
LBH T9	Crane	86450	86975	50%	BL83B	LEFT	Forest		0.2380	0.2380	0.4
LBH T9	Crane	86675	86800	50%	RB37	RIGHT	Forest		0.0567	0.0567	0.4
LBH T9	Crane	86800	86975	50%	NONE	RIGHT			0.0793	0.0793	1
LBH T9	Crane	86975	87375	50%	BL84	LEFT	Forest		0.1814	0.1814	0.4
LBH T9	Crane	86975	87180	50%	BL84	RIGHT	Forest		0.0929	0.0929	0.4
LBH T9	Crane	87375	87425	50%	RB38	LEFT	Forest		0.0227	0.0227	0.4
LBH T9	Crane	87180	87400	50%	RB39	RIGHT	Forest		0.0997	0.0997	0.4
LBH T9	Crane	87400	87675	50%	B8	RIGHT	Forest		0.1247	0.1247	0.4
T8	Turbine			100%	B8		Forest		0.3604	0.3604	0.4
LBH T9	Crane	87425	87850	50%	BL85	LEFT	Forest		0.1927	0.1927	0.4
LBH T9	Crane	87675	87745	50%	BL89	RIGHT	Forest		0.0317	0.0317	0.4
LBH T11	Access	90300	90750	100%	BL89	BOTH	Forest	18	0.0620	0.2479	0.4
LBH T11	Access	90750	91200	100%	BL90	BOTH	Forest	18	0.0620	0.2479	0.4
LBH T10	Crane	95240	95375	50%	NONE	RIGHT			0.0612	0.0612	1
LBH T10	Crane	95300	95375	50%	NONE	LEFT			0.0340	0.0340	1
T10	Turbine			100%	NONE				0.2878	0.2878	1
LBH T11	Crane	100575	100875	50%	NONE	RIGHT			0.1360	0.1360	1

Total Impervious **17.191** acres

Project Name	**Weaver Wind**	BA=Buffer Adjacent to Small Imp	RB=Roadside buffer	BRS=Roadside Buffer with Rock Sandwich
Project Number	**84176E**	BL=Buffer w/level spreader	DB=Detention basin	
Date	10/12/2018	DT=Buffer w/ditch turnout	WP=Wet pond	
Done by	JAO	USF=Underdrain Soil Filter	INF=Infiltration	

QUALITY CALCULATIONS FOR LINEAR PORTION

Spectacle Pond (Osborn)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C):	P	0.07	# P/acre/year	Total ac of devel. parcel:	TA	208.34	acres
Small Watershed Threshold (Appendix C)	SWT	335	acres	NWI wetland acreage:	WA		acres
Allowable increase in Town's share of annual phos (App C)	FC	93.24	lbs P/year	Steep slope acreage:	SA		acres
Area avail. For development (App C)	AAD	6691	acres	Existing imp area (Pre 1980)	EIA_B		acres
Project acreage: $A = TA - (WA + SA + EIA_B + EIA_A)$	A	208.34	acres	Existing imp area (post 1980)	EIA_A		acres
A/AAD	R	0.031					

Project Phos Budget: PPB = P x A	**PPB**	**14.5840**	**lbs P/year**
Project Phos Budget with small watershed adjustment:	**PPB**	**N/A**	**lbs P/year**

Total Post Development Phos Export (lbs P/yr)=	**13.9395**	<=	**14.5840**	Access rd width(Const)=	24	Crane path width(Const)=	39.5
% of Project Treated for Watershed=		>=	75%	Access rd width(Perm)=	24	Crane path width(Perm)=	39.5
Total Impervious Area for Watershed=	15.96	Acres		Existing NC=	remain as is	Met Tower Rd width=	16

North String

Roadway Alignment or Turbine Site	Access Crane Turbine	Station	to Station	% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
T20	Turbine			30%	B20				0.2878	0.2878	0.4	1.75	0.5036	0.2014
Access/Crane T23	Access	11175	11500	50%	RB4	Right	Forest		0.0895	0.0895	0.4	1.75	0.1567	0.0627
Access/Crane T23	Crane	11500	11960	50%	RB4	Right	Forest		0.2086	0.2086	0.4	1.75	0.3650	0.1460
Access/Crane T23	Crane	11800	12150	50%	BL10	Left	Forest		0.1587	0.1587	0.4	1.75	0.2777	0.1111
Access/Crane T23	Crane	12150	12725	50%	NONE	Left			0.2607	0.2607	1	1.75	0.4562	0.4562
T22	Turbine			50%	BL10		Forest		0.3121	0.3121	0.4	1.75	0.5462	0.2185
Access/Crane T23	Crane	11960	12025	50%	BL10	Right	Forest		0.0295	0.0295	0.4	1.75	0.0516	0.0206
Access/Crane T23	Crane	12025	12725	50%	NONE	Right			0.3174	0.3174	1	1.75	0.5554	0.5554
Access/Crane T23	Crane	12725	12900	100%	BL11	Both	Meadow		0.1587	0.1587	0.4	1.75	0.2777	0.1111
Access/Crane T23	Crane	12900	13100	50%	RB5	Left	Forest		0.0907	0.0907	0.4	1.75	0.1587	0.0635
Access/Crane T23	Crane	13100	13200	50%	NONE	Left			0.0453	0.0453	1	1.75	0.0793	0.0793
Access/Crane T23	Crane	13200	13275	50%	B23	Left	Meadow		0.0340	0.0340	0.4	1.75	0.0595	0.0238
Access/Crane T23	Crane	12900	13275	50%	B23	Right	Meadow		0.1700	0.1700	0.4	1.75	0.2975	0.1190
T23	Turbine			100%	B23		Meadow		0.2878	0.2878	0.4	1.75	0.5036	0.2014
T25	Turbine			50%	B25		Forest		0.3123	0.3123	0.4	1.75	0.5466	0.2186
Access/Crane T24	Crane	26600	26800	50%	B25	Left	Forest		0.0907	0.0907	0.4	1.75	0.1587	0.0635
Access/Crane T24	Crane	26800	27100	50%	BL22	Left	Forest		0.1360	0.1360	0.4	1.75	0.2380	0.0952
Access/Crane T24	Crane	26500	27075	50%	BL22	RIGHT	Forest		0.2607	0.2607	0.4	1.75	0.4562	0.1825
Access/Crane T24	Crane	27075	27500	50%	BL23	RIGHT	Forest		0.1927	0.1927	0.4	1.75	0.3372	0.1349
Access/Crane T24	Crane	27100	27510	50%	BL23	Left	Forest		0.1859	0.1859	0.4	1.75	0.3253	0.1301
Access/Crane T24	Crane	27510	27950	50%	BL24	Left	Forest		0.1995	0.1995	0.4	1.75	0.3491	0.1396
Access/Crane T24	Crane	27500	28045	50%	BL25	RIGHT	Forest		0.2471	0.2471	0.4	1.75	0.4324	0.1730
T24	Turbine			50%	BL25		Forest		0.2878	0.2878	0.4	1.75	0.5036	0.2014
T24	Turbine			50%	B24		Forest		0.2878	0.2878	0.4	1.75	0.5036	0.2014
Access/Crane T24	Crane	27950	28045	50%	B24	Left	Forest		0.0431	0.0431	0.4	1.75	0.0754	0.0302

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
Access Een Ridge	Access	30021	30400	50%	NONE	RIGHT	Forest	10	0.0609	0.1044	1	1.75	0.1066	0.1066
Access Een Ridge	Access	30021	30375	50%	NONE	LEFT	Forest	10	0.0569	0.0975	1	1.75	0.0996	0.0996
Access Een Ridge	Access	30400	30700	50%	BL26	RIGHT	Meadow	10	0.0482	0.0826	0.4	1.75	0.0844	0.0337
Access Een Ridge	Access	30375	30500	50%	NONE	LEFT	Forest	10	0.0201	0.0344	1	1.75	0.0352	0.0352
Access Een Ridge	Access	30500	30900	50%	BL28	LEFT	Forest	10	0.0643	0.1102	0.4	1.75	0.1125	0.0450
Access Een Ridge	Access	30700	31025	50%	BL27	RIGHT	Forest	10	0.0522	0.0895	0.4	1.75	0.0914	0.0366
Access Een Ridge	Access	31025	31150	50%	RB8	RIGHT	Forest		0.0344	0.0344	0.4	1.75	0.0603	0.0241
Access Een Ridge	Access	31150	31400	50%	BL30	RIGHT	Forest		0.0689	0.0689	0.4	1.75	0.1205	0.0482
Access Een Ridge	Access	31400	31725	50%	RB9	RIGHT	Forest		0.0895	0.0895	0.4	1.75	0.1567	0.0627
Access Een Ridge	Access	30900	31400	50%	BL29	LEFT	Forest		0.1377	0.1377	0.4	1.75	0.2410	0.0964
Access Een Ridge	Access	31400	32000	50%	BL31	LEFT	Forest		0.1653	0.1653	0.4	1.75	0.2893	0.1157
Access Een Ridge	Access	31725	32000	50%	BL32	RIGHT	Forest		0.0758	0.0758	0.4	1.75	0.1326	0.0530
Access Een Ridge	Access	32000	32500	50%	BL33	RIGHT	Forest		0.1377	0.1377	0.4	1.75	0.2410	0.0964
Access Een Ridge	Access	32000	32500	50%	BL34	LEFT	Forest		0.1377	0.1377	0.4	1.75	0.2410	0.0964
Access Een Ridge	Access	32500	32750	50%	BL35	LEFT	Forest		0.0689	0.0689	0.4	1.75	0.1205	0.0482
Access Een Ridge	Access	32500	32900	50%	BL36	RIGHT	Forest		0.1102	0.1102	0.4	1.75	0.1928	0.0771
Access Een Ridge	Access	32750	32885	50%	RB10	LEFT	Forest		0.0372	0.0372	0.4	1.75	0.0651	0.0260
Access Een Ridge	Access	32885	32900	50%	BL37	LEFT	Forest		0.0041	0.0041	0.4	1.75	0.0072	0.0029
Access Een Ridge	Access	32900	33160	50%	RB11	LEFT	Forest		0.0716	0.0716	0.4	1.75	0.1253	0.0501
Crane P Een Ridge	Crane	40000	40650	50%	RB11	LEFT	Forest		0.2947	0.2947	0.4	1.75	0.5157	0.2063
Access Een Ridge	Access	32900	33160	50%	BL37	RIGHT	Forest		0.0716	0.0716	0.4	1.75	0.1253	0.0501
Crane P Een Ridge	Crane	40000	40200	50%	BL37	RIGHT	Forest		0.0907	0.0907	0.4	1.75	0.1587	0.0635
Crane P Een Ridge	Crane	40200	40250	50%	B19	RIGHT	Forest		0.0227	0.0227	0.4	1.75	0.0397	0.0159
T19	Turbine			75%	B19		Forest		0.3123	0.3123	0.4	1.75	0.5466	0.2186
Crane P Een Ridge	Crane	42200	42300	50%	RB12	LEFT	Forest		0.0453	0.0453	0.4	1.75	0.0793	0.0317
Crane P Een Ridge	Crane	42300	42500	50%	BL42	RIGHT	Forest		0.0907	0.0907	0.4	1.75	0.1587	0.0635
Crane P Een Ridge	Crane	42300	42510	50%	BL42	LEFT	Forest		0.0952	0.0952	0.4	1.75	0.1666	0.0666
Crane P Een Ridge	Crane	42950	43050	50%	RB13	LEFT	Forest	10	0.0339	0.0453	0.4	1.75	0.0593	0.0237
Crane P Een Ridge	Crane	43050	43225	50%	NONE	LEFT	Forest		0.0793	0.0793	1	1.75	0.1389	0.1389
T18	Turbine			50%	B18		Forest		0.3123	0.3123	0.4	1.75	0.5466	0.2186
T18	Turbine			50%	BL43B		Forest		0.3123	0.3123	0.4	1.75	0.5466	0.2186
Crane P Een Ridge	Crane	43200	43500	50%	RB14	RIGHT	Forest		0.1360	0.1360	0.4	1.75	0.2380	0.0952
Crane P Een Ridge	Crane	43225	43350	50%	B18	LEFT	Forest		0.0567	0.0567	0.4	1.75	0.0992	0.0397
Crane P Een Ridge	Crane	43350	43850	50%	BL43B	LEFT	Forest		0.2267	0.2267	0.4	1.75	0.3967	0.1587
Crane P Een Ridge	Crane	43500	43850	50%	BL43B	RIGHT	Forest		0.1587	0.1587	0.4	1.75	0.2777	0.1111
Crane P Een Ridge	Crane	43850	44150	50%	RB15	LEFT	Forest		0.1360	0.1360	0.4	1.75	0.2380	0.0952
Crane P Een Ridge	Crane	43850	44150	50%	NONE	RIGHT			0.1360	0.1360	1	1.75	0.2380	0.2380
Crane P Een Ridge	Crane	44150	44250	50%	BL46	RIGHT	Forest		0.0453	0.0453	0.4	1.75	0.0793	0.0317
Crane P Een Ridge	Crane	44250	44450	50%	BL44	RIGHT	Meadow		0.0907	0.0907	0.4	1.75	0.1587	0.0635
Crane P Een Ridge	Crane	44150	44450	50%	BL45	LEFT	Forest		0.1360	0.1360	0.4	1.75	0.2380	0.0952
Crane P Een Ridge	Crane	44450	44537	100%	B17	BOTH	Forest		0.0789	0.0789	0.4	1.75	0.1381	0.0552
T17	Turbine			100%	B17		Forest		0.2878	0.2878	0.4	1.75	0.5036	0.2014
Weaver Access Rd	Access	50300	50350	50%	BL44	LEFT	Forest		0.0138	0.0138	0.4	1.75	0.0241	0.0096
Weaver Access Rd	Access	50350	50480	50%	BL46A	LEFT	Forest		0.0358	0.0358	0.4	1.75	0.0627	0.0251
Weaver Access Rd	Access	50300	50480	50%	BL46	RIGHT	Forest		0.0496	0.0496	0.4	1.75	0.0868	0.0347
Weaver Access Rd	Access	50480	50750	100%	BL46A	BOTH	Forest		0.1488	0.1488	0.4	1.75	0.2603	0.1041
Weaver Access Rd	Access	50750	51175	100%	BL46B	BOTH	Forest		0.2342	0.2342	0.4	1.75	0.4098	0.1639
Weaver Access Rd	Access	51175	51325	50%	RB17	LEFT	Forest		0.0413	0.0413	0.4	1.75	0.0723	0.0289
Weaver Access Rd	Access	51325	51650	50%	NONE	LEFT			0.0895	0.0895	1	1.75	0.1567	0.1567
Weaver Access Rd	Access	51650	52000	50%	RB18	LEFT	Meadow	14	0.0402	0.0964	0.4	1.75	0.0703	0.0281
Weaver Access Rd	Access	52000	52075	50%	BL47	LEFT	Forest	14	0.0086	0.0207	0.4	1.75	0.0151	0.0060
Weaver Access Rd	Access	52075	52315	50%	RB19	LEFT	Meadow	14	0.0275	0.0661	0.4	1.75	0.0482	0.0193
Weaver Access Rd	Access	52315	52560	50%	BL48	LEFT	Forest	14	0.0281	0.0675	0.4	1.75	0.0492	0.0197
Weaver Access Rd	Transport Widen	52525	52560	100%	BL48	LEFT	Forest		0.0016	0.0016	0.4	1.75	0.0028	0.0011
Weaver Access Rd	Transport Widen	52560	52675	100%	BL48A	LEFT	Forest		0.0053	0.0053	0.4	1.75	0.0093	0.0037
Weaver Access Rd	Access	52560	52750	50%	BL48A	LEFT	Forest	14	0.0218	0.0523	0.4	1.75	0.0382	0.0153
Weaver Access Rd	Access	51175	51710	50%	BL47A	RIGHT	Meadow		0.1474	0.1474	0.4	1.75	0.2579	0.1032
Weaver Access Rd	Access	51710	52050	50%	BL47	RIGHT	Forest	14	0.0390	0.0937	0.4	1.75	0.0683	0.0273
Weaver Access Rd	Access	52050	52540	50%	BL48	RIGHT	Forest	14	0.0562	0.1350	0.4	1.75	0.0984	0.0394
Weaver Access Rd	Transport Widen	52525	52540	100%	BL48	RIGHT	Forest		0.0007	0.0007	0.4	1.75	0.0012	0.0005

Weaver Access Rd	Access	52750	53800	50%	NONE	LEFT		14	0.1205	0.2893	1	1.75	0.2109	0.2109
Weaver Access Rd	Transport Widen	52925	53200	100%	NONE	LEFT			0.1334	0.1334	1	1.75	0.2335	0.2335
Weaver Access Rd	Access	52540	52750	50%	BL48A	RIGHT	Forest	14	0.0241	0.0579	0.4	1.75	0.0422	0.0169
Weaver Access Rd	Transport Widen	52540	52675	100%	BL48A	RIGHT	Forest		0.0062	0.0062	0.4	1.75	0.0109	0.0043
Weaver Access Rd	Access	52750	53250	50%	NONE	RIGHT		14	0.0574	0.1377	1	1.75	0.1004	0.1004
Weaver Access Rd	Access	53250	53800	50%	RB21	RIGHT	Forest	14	0.0631	0.1515	0.4	1.75	0.1105	0.0442
Weaver Crane Path	Crane	60475	61200	50%	BL53	LEFT	Forest		0.3287	0.3287	0.4	1.75	0.5752	0.2301

Little Bull Hill West

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
LBH West Access	Access	70017	70050	100%	NONE	BOTH		14	0.0076	0.0182	1	1.75	0.0133	0.0133
LBH West Access	Access	70050	70200	50%	RB26	RIGHT	Meadow	14	0.0172	0.0413	0.4	1.75	0.0301	0.0121
LBH West Access	Access	70200	70225	50%	NONE	RIGHT		14	0.0029	0.0069	1	1.75	0.0050	0.0050
LBH West Access	Access	70225	70425	50%	RB27	RIGHT	Meadow	14	0.0230	0.0551	0.4	1.75	0.0402	0.0161
LBH West Access	Access	70050	70425	50%	RB28	LEFT	Meadow	14	0.0430	0.1033	0.4	1.75	0.0753	0.0301
LBH West Access	Access	70425	70900	100%	BL61	BOTH	Forest	10	0.1527	0.2617	0.4	1.75	0.2672	0.1069
LBH West Access	Access	70900	71175	50%	BL62	RIGHT	Forest	10	0.0442	0.0758	0.4	1.75	0.0773	0.0309
LBH West Access	Access	70900	71275	50%	BL62	LEFT	Forest	10	0.0603	0.1033	0.4	1.75	0.1055	0.0422
LBH West Access	Access	71175	71275	50%	RB29	RIGHT	Forest	10	0.0161	0.0275	0.4	1.75	0.0281	0.0112
LBH West Access	Access	71275	71485	100%	BL63	BOTH	Forest	10	0.0675	0.1157	0.4	1.75	0.1181	0.0472
LBH West Access	Access	71485	71600	100%	NONE	BOTH		10	0.0370	0.0634	1	1.75	0.0647	0.0647
LBH West Access	Access	71600	71880	100%	BL64	BOTH	Forest	10	0.0900	0.1543	0.4	1.75	0.1575	0.0630
LBH West Access	Access	71880	71900	50%	BL65	RIGHT	Meadow	16	0.0018	0.0055	0.4	1.75	0.0032	0.0013
LBH West Access	Access	71900	71975	50%	RB30	RIGHT	Meadow	16	0.0069	0.0207	0.4	1.75	0.0121	0.0048
LBH West Access	Access	71975	72100	50%	BL66	RIGHT	Meadow	16	0.0115	0.0344	0.4	1.75	0.0201	0.0080
LBH West Access	Access	71880	72350	50%	BL65	LEFT	Forest	16	0.0432	0.1295	0.4	1.75	0.0755	0.0302
LBH West Access	Access	72100	72350	50%	RB31	RIGHT	Meadow	16	0.0230	0.0689	0.4	1.75	0.0402	0.0161
LBH West Access	Access	72350	72550	50%	BL67	RIGHT	Forest	14	0.0230	0.0551	0.4	1.75	0.0402	0.0161
LBH West Access	Access	72550	73150	50%	RB32	RIGHT	Meadow	14	0.0689	0.1653	0.4	1.75	0.1205	0.0482
LBH West Access	Access	72350	72800	50%	BL67	LEFT	Forest	14	0.0517	0.1240	0.4	1.75	0.0904	0.0362
LBH West Access	Access	72800	73000	50%	NONE	LEFT		14	0.0230	0.0551	1	1.75	0.0402	0.0402
LBH West Access	Access	73150	73225	50%	BL68	RIGHT	Forest	14	0.0086	0.0207	0.4	1.75	0.0151	0.0060
LBH West Access	Access	73225	73538	50%	BL68	RIGHT	Forest		0.0862	0.0862	0.4	1.75	0.1509	0.0604
LBH West Access	Access	73000	73225	50%	BL68	LEFT	Forest	14	0.0258	0.0620	0.4	1.75	0.0452	0.0181
LBH West Access	Access	73225	73538	50%	BL68	LEFT	Forest		0.0862	0.0862	0.4	1.75	0.1509	0.0604
LBH West	Crane	77200	77300	50%	B4	RIGHT	Forest		0.0453	0.0453	0.4	1.75	0.0793	0.0317
LBH West	Crane	77300	77700	50%	RB33	RIGHT	Forest		0.1814	0.1814	0.4	1.75	0.3174	0.1270
LBH West	Crane	77700	78200	50%	BL68	RIGHT	Forest		0.2267	0.2267	0.4	1.75	0.3967	0.1587
LBH West	Crane	78200	78550	50%	BL69	RIGHT	Forest		0.1587	0.1587	0.4	1.75	0.2777	0.1111
LBH West	Crane	78550	78680	50%	B5	RIGHT	Forest		0.0589	0.0589	0.4	1.75	0.1031	0.0413
LBH West	Crane	77200	78200	50%	BL70	LEFT	Forest		0.4534	0.4534	0.4	1.75	0.7934	0.3174
LBH West	Crane	78200	78550	50%	BL70	LEFT	Forest		0.1587	0.1587	0.4	1.75	0.2777	0.1111
LBH West	Crane	78550	78680	50%	B5	LEFT	Forest		0.0589	0.0589	0.4	1.75	0.1031	0.0413
T4	Turbine			50%	B4		Forest		0.3121	0.3121	0.4	1.75	0.5462	0.2185
T5	Turbine			100%	B5		Forest		0.2878	0.2878	0.4	1.75	0.5036	0.2014

Stone Dam Rd

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
Stone Dam Rd	Widening	41090	41180	100%	NONE	Right			0.0105	0.0105	1	1.75	0.0184	0.0184
Stone Dam Rd	Widening	41875	42040	100%	NONE	Right			0.0145	0.0145	1	1.75	0.0254	0.0254
Stone Dam Rd	Widening	42800	43075	100%	NONE	Right			0.0855	0.0855	1	1.75	0.1496	0.1496
Stone Dam Rd	Widening	43580	43710	100%	NONE	Left			0.0187	0.0187	1	1.75	0.0327	0.0327
Stone Dam Rd	Widening	43710	44045	100%	NONE	Right			0.1998	0.1998	1	1.75	0.3497	0.3497
Stone Dam Rd	Widening	43960	44275	100%	NONE	Left			0.0314	0.0314	1	1.75	0.0549	0.0549
Stone Dam Rd	Widening	44060	44275	100%	NONE	Right			0.0620	0.0620	1	1.75	0.1085	0.1085
Stone Dam Rd	Widening	44325	44810	100%	NONE	Right			0.0497	0.0497	1	1.75	0.0869	0.0869
Stone Dam Rd	Widening	44325	44575	100%	NONE	Left			0.1001	0.1001	1	1.75	0.1752	0.1752
Stone Dam Rd	Widening	44690	45010	100%	NONE	Left			0.1331	0.1331	1	1.75	0.2329	0.2329
Stone Dam Rd	Widening	45280	45680	100%	NONE	Right			0.0664	0.0664	1	1.75	0.1163	0.1163

Stone Dam Rd	Widening	45710	46170	100%	NONE	Right			0.1855	0.1855	1	1.75	0.3246	0.3246
Stone Dam Rd	Widening	46910	47310	100%	NONE	Left			0.0319	0.0319	1	1.75	0.0558	0.0558
Stone Dam Rd	Widening	47010	47360	100%	NONE	Right			0.0453	0.0453	1	1.75	0.0793	0.0793
Stone Dam Rd	Widening	47410	47450	100%	NONE	Right			0.0014	0.0014	1	1.75	0.0025	0.0025
Stone Dam Rd	Widening	47490	47825	100%	NONE	Left			0.2437	0.2437	1	1.75	0.4265	0.4265
Stone Dam Rd	Widening	47490	47950	100%	NONE	Right			0.0825	0.0825	1	1.75	0.1443	0.1443
Stone Dam Rd	Widening	47875	48225	100%	NONE	Left			0.0502	0.0502	1	1.75	0.0879	0.0879
Stone Dam Rd	Widening	48125	48325	100%	NONE	Right			0.0254	0.0254	1	1.75	0.0445	0.0445
Stone Dam Rd	Widening	48525	48775	100%	NONE	Right			0.0286	0.0286	1	1.75	0.0501	0.0501
Stone Dam Rd	Widening	48610	49075	100%	NONE	Left			0.0517	0.0517	1	1.75	0.0904	0.0904
Stone Dam Rd	Widening	48810	49025	100%	NONE	Right			0.0199	0.0199	1	1.75	0.0348	0.0348
Stone Dam Rd	Widening	50025	50200	100%	NONE	Left			0.0192	0.0192	1	1.75	0.0335	0.0335
Stone Dam Rd	Widening	50210	50450	100%	NONE	Right			0.0189	0.0189	1	1.75	0.0331	0.0331
Stone Dam Rd	Widening	50350	50640	100%	NONE	Left			0.0276	0.0276	1	1.75	0.0484	0.0484
Stone Dam Rd	Widening	51175	51475	100%	NONE	Left			0.0356	0.0356	1	1.75	0.0623	0.0623
Stone Dam Rd	Widening	51450	51840	100%	NONE	Right			0.0391	0.0391	1	1.75	0.0684	0.0684
Stone Dam Rd	Widening	51540	51780	100%	NONE	Left			0.0320	0.0320	1	1.75	0.0559	0.0559
Stone Dam Rd	Widening	51860	52060	100%	NONE	Left			0.0144	0.0144	1	1.75	0.0252	0.0252
Stone Dam Rd	Widening	51855	52175	100%	NONE	Right			0.0908	0.0908	1	1.75	0.1589	0.1589
Stone Dam Rd	Widening	53575	53925	100%	NONE	Left			0.0436	0.0436	1	1.75	0.0763	0.0763
Stone Dam Rd	Widening	54110	54340	100%	NONE	Right			0.0118	0.0118	1	1.75	0.0206	0.0206
Stone Dam Rd	Widening	54275	54475	100%	NONE	Left			0.0195	0.0195	1	1.75	0.0341	0.0341
										0.0000				
										0.0000				

Total Impervious **15.962** acres Total Pre Tx Phos **27.9333** lbs P/year Total Post Tx Phos **14.6783** lbs P/year

1.8902

Mitigation credit when a pre-existing source is treated by a new BMP

Watershed	**Existing Road Area to be Tx** (acres)	**Export Coefficient** (lbs P/acre/year)	**Modifier**	**Pre-treatment Historical P Export** (lbs P/year)	**Treatment Factor for Historical BMP(s)** (1.0 if no BMPs)	**Historical P Export** (lbs P/year)		**Treatment Factor for New BMP(s)** Chapter 6	**Mitigation Credit** (lbs P/year)		**Comments**
Spec Pond (Osborn)	1.4073	1.75	0.5	1.2313	1	1.2313	1 -	0.4	0.7388		
				Total source treatment mitiagion credit (STC)					**0.7388**		**lbs P/year**

Project Name	**Weaver Wind**	BA=Buffer Adjacent to Small Imp	RB=Roadside buffer	BRS=Roadside Buffer with Rock Sandwich
Project Number	**84176E**	BL=Buffer w/level spreader	DB=Detention basin	
Date	10/16/2018	DT=Buffer w/ditch turnout	WP=Wet pond	
Done by	JAO	USF=Underdrain Soil Filter	INF=Infiltration	

QUALITY CALCULATIONS FOR LINEAR PORTION

Spectacle Pond (Eastbrook)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C):	P	0.062	# P/acre/year	Total ac of devel. parcel:	TA	203.76	acres
Small Watershed Threshold (Appendix C)	SWT	36	acres	NWI wetland acreage:	WA		acres
Allowable increase in Town's share of annual phos (App C)	FC	8.86	lbs P/year	Steep slope acreage:	SA		acres
Area avail. For development (App C)	AAD	718	acres	Existing imp area (Pre 1980)	EIA_B		acres
Project acreage: A = TA - (WA + SA + EIA_B + EIA_A)	A	203.76	acres	Existing imp area (post 1980)	EIA_A		acres
A/AAD	R	0.284					
				Project Phos Budget: PPB = P x A	**PPB**	**N/A**	**lbs P/year**
				Project Phos Budget with small watershed adjustment:	**PPB**	**3.4722**	**lbs P/year**

Total Post Development Phos Export (lbs P/yr)=	**3.4341**	<=	**3.4722**	Access rd width(Const)=	24	Crane path width(Const)=	39.5
% of Project Treated for Mill Privilege Pond WS=	**96.79%**	>=	75%	Access rd width(Perm)=	24	Crane path width(Perm)=	39.5
Total Impervious Area for Mill Priviledge Pond WS=	6.71	Acres		Existing NC=	remain as is	Met Tower Rd width=	16

Little Bull Hill

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
LBH T6	Access	80010	80350	100%	NONE	BOTH		15	0.0702	0.2677	1	1.75	0.1229	0.1229
LBH T6	Access	80350	80900	100%	BL76	BOTH	Forest	15	0.1136	0.3030	0.4	1.75	0.1989	0.0795
LBH T6	Access	80900	81400	100%	BL77	BOTH	Forest	15	0.1033	0.2755	0.3	1.75	0.1808	0.0542
LBH T9	Crane	87745	88025	50%	BL86	RIGHT	Forest		0.1270	0.1270	0.3	1.75	0.2222	0.0666
LBH T9	Crane	87850	88350	50%	BL87	LEFT	Forest		0.2267	0.2267	0.3	1.75	0.3967	0.1190
LBH T9	Crane	88025	88325	50%	RB40	RIGHT	Forest		0.1360	0.1360	0.3	1.75	0.2380	0.0714
LBH T9	Crane	88325	88450	50%	BL87	RIGHT	Forest		0.0567	0.0567	0.3	1.75	0.0992	0.0298
LBH T9	Crane	88450	88575	50%	RB40A	RIGHT	Forest		0.0567	0.0567	0.3	1.75	0.0992	0.0298
LBH T9	Crane	88575	88860	50%	BL88	RIGHT	Meadow		0.1292	0.1292	0.3	1.75	0.2261	0.0678
LBH T9	Crane	88350	88860	50%	BL88	LEFT	Meadow		0.2312	0.2312	0.3	1.75	0.4047	0.1214
LBH T9	Crane	88860	88975	100%	B9	BOTH	Meadow		0.1043	0.1043	0.3	1.75	0.1825	0.0547
T9	Turbine			100%	B9		Meadow		0.2878	0.2878	0.3	1.75	0.5036	0.1511
LBH T11	Existing NC	91200	91750	100%	BL91	BOTH	Forest	18	0.0000	0.2273	0.3	1.75	0.0000	0.0000
LBH T11	Access	91750	92150	100%	BL91	BOTH	Forest	18	0.0551	0.2204	0.3	1.75	0.0964	0.0289
LBH T11	Existing NC	92150	92850	100%		Remain As Is		18	0.0000	0.0000	1	1.75	0.0000	0.0000
LBH T11	Access	92850	93350	100%	BL92	BOTH	Forest	20	0.0459	0.2755	0.4	1.75	0.0803	0.0321
LBH T10	Crane	95012	95240	50%	BL92	RIGHT	Forest		0.1034	0.1034	0.4	1.75	0.1809	0.0724
LBH T10	Crane	95012	95300	50%	BL92	LEFT			0.1306	0.1306	0.4	1.75	0.2285	0.0914
LBH T11	Access	93350	93525	50%	NONE	LEFT		18	0.0121	0.0482	1	1.75	0.0211	0.0211
LBH T11	Access	93350	93525	50%	BL92	RIGHT		18	0.0121	0.0482	0.3	1.75	0.0211	0.0063
LBH T11	Existing NC	93525	94250	100%		Remain As Is		16	0.0000	0.0000	1	1.75	0.0000	0.0000
LBH T11	Access	94250	94350	100%	NONE	BOTH		16	0.0184	0.0551	1	1.75	0.0321	0.0321
LBH T11	Access	94350	94725	100%	BL93	BOTH	Forest	16	0.0689	0.2066	0.3	1.75	0.1205	0.0362
PMT12	Existing NC	111200	111850	100%		Remain As Is		12	0.0000	0.0000	1	1.75	0.0000	0.0000
PMT12	Existing NC	111850	112050	100%	BL107	BOTH	Meadow	12	0.0000	0.0551	0.3	1.75	0.0000	0.0000
PMT12	MET	112050	112100	100%	BL107	BOTH	Meadow	12	0.0184	0.0321	0.3	1.75	0.0321	0.0096
PMT12	MET	112100	112250	100%	BL107	BOTH	Meadow		0.0551	0.0551	0.3	1.75	0.0964	0.0289

PMT12	MET	112250	112289	100%	NONE	BOTH			0.0143	0.0143	1	1.75	0.0251	0.0251
LBH T11	Access	94725	94884	50%	RB41	RIGHT	Forest		0.0438	0.0438	0.3	1.75	0.0767	0.0230
LBH T11	Access	94725	94884	50%	NONE	LEFT			0.0438	0.0438	1	1.75	0.0767	0.0767
LBH T11	Crane	100000	100575	50%	BL94	RIGHT	Forest		0.2607	0.2607	0.3	1.75	0.4562	0.1369
LBH T11	Crane	100000	100775	50%	BL94A	LEFT	Meadow		0.3514	0.3514	0.3	1.75	0.6149	0.1845
T11	Turbine			100%	BL94		Forest		0.3160	0.3160	0.3	1.75	0.5530	0.1659
LBH T11	Crane	100875	101125	50%	BL95	RIGHT	Meadow		0.1133	0.1133	0.3	1.75	0.1984	0.0595
LBH T11	Crane	100775	101275	50%	BL95	LEFT	Meadow		0.2267	0.2267	0.3	1.75	0.3967	0.1190
LBH T11	Crane	101125	101300	50%	BL95	RIGHT	Meadow		0.0793	0.0793	0.3	1.75	0.1389	0.0417
LBH T11	Crane	101300	101600	100%	BL96	BOTH	Forest		0.2720	0.2720	0.3	1.75	0.4761	0.1428
LBH T11	Crane	101600	102025	50%	BL97	LEFT	Forest		0.1927	0.1927	0.3	1.75	0.3372	0.1012
LBH T11	Crane	101600	102000	50%	B12	RIGHT	Meadow		0.1814	0.1814	0.3	1.75	0.3174	0.0952
T12	Turbine			100%	B12				0.3123	0.3123	0.3	1.75	0.5466	0.1640
LBH T11	Crane	102000	102025	50%	BL97	RIGHT	Forest		0.0113	0.0113	0.3	1.75	0.0198	0.0060
LBH T11	Crane	102025	102300	50%	BL98	LEFT	Forest		0.1247	0.1247	0.3	1.75	0.2182	0.0655
LBH T11	Crane	102025	102250	50%	RB42	RIGHT	Forest		0.1020	0.1020	0.3	1.75	0.1785	0.0536
LBH T11	Crane	102250	102300	50%	BL98	RIGHT	Forest		0.0227	0.0227	0.3	1.75	0.0397	0.0119
LBH T11	Crane	102300	102755	100%	BL99	BOTH	Forest		0.4126	0.4126	0.3	1.75	0.7220	0.2166
LBH T11	Crane	102755	103050	50%	BL100	LEFT	Forest		0.1338	0.1338	0.3	1.75	0.2341	0.0702
LBH T11	Crane	102755	103025	50%	RB43	RIGHT	Forest		0.1224	0.1224	0.3	1.75	0.2142	0.0643
LBH T11	Crane	103025	103050	50%	BL100	RIGHT	Forest		0.0113	0.0113	0.3	1.75	0.0198	0.0060
LBH T11	Crane	103050	103575	100%	BL101	BOTH	Forest		0.4761	0.4761	0.3	1.75	0.8331	0.2499
LBH T11	Crane	103575	103750	50%	BL102	LEFT	Forest		0.0793	0.0793	0.3	1.75	0.1389	0.0417
LBH T11	Crane	103750	103800	50%	NONE	LEFT			0.0227	0.0227	1	1.75	0.0397	0.0397
LBH T11	Crane	103575	103900	50%	BL103	RIGHT	Forest		0.1474	0.1474	0.3	1.75	0.2579	0.0774
LBH T11	Crane	103900	103975	50%	NONE	RIGHT			0.0340	0.0340	1	1.75	0.0595	0.0595
LBH T11	Crane	103975	104060	50%	BL104	RIGHT	Forest		0.0385	0.0385	0.3	1.75	0.0674	0.0202
LBH T11	Crane	103800	103850	50%	BL103	LEFT	Forest		0.0227	0.0227	0.3	1.75	0.0397	0.0119
LBH T11	Crane	103850	104060	50%	RB44	LEFT	Forest		0.0952	0.0952	0.3	1.75	0.1666	0.0500
T13	Turbine			100%	BL104				0.2878	0.2878	0.3	1.75	0.5036	0.1511

Total Impervious **6.715** acres Total Pre Tx Phos **11.7508** lbs P/year Total Post Tx Phos **3.8581** lbs P/year

Mitigation credit when a pre-existing source is treated by a new BMP

Watershed	Existing Road Area to be Tx (acres)	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)		Treatment Factor for New BMP(s) Chapter 6	Mitigation Credit (lbs P/year)		Comments
Spec Pond (EB)	0.8075	1.75	0.5	0.7066	1	0.7066	1 -	0.4	0.4239		
				Total source treatment mitiagion credit (STC)					**0.4239**		**lbs P/year**

Project Name	**Weaver Wind**	BA=Buffer Adjacent to Small Imp	RB=Roadside buffer	BRS=Roadside Buffer with Rock Sandwich
Project Number	**84176E**	BL=Buffer w/level spreader	DB=Detention basin	
Date	10/16/2018	DT=Buffer w/ditch turnout	WP=Wet pond	
Done by	JAO	USF=Underdrain Soil Filter	INF=Infiltration	

QUALITY CALCULATIONS FOR LINEAR PORTION

Spectacle Pond (T22MD)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C):	P	0.073	# P/acre/year	Total ac of devel. parcel:	TA	1.73	acres
Small Watershed Threshold (Appendix C)	SWT	224	acres	NWI wetland acreage:	WA		acres
Allowable increase in Town's share of annual phos (App C)	FC	65.46	lbs P/year	Steep slope acreage:	SA		acres
Area avail. For development (App C)	AAD	4470	acres	Existing imp area (Pre 1980)	EIA_B		acres
Project acreage: $A = TA - (WA + SA + EIA_B + EIA_A)$	A	1.73	acres	Existing imp area (post 1980)	EIA_A		acres
A/AAD	R	0.000					

Project Phos Budget: PPB = P x A	**PPB**	**0.126**	**lbs P/year**
Project Phos Budget with small watershed adjustment:	**PPB**	**N/A**	**lbs P/year**

Total Post Development Phos Export (lbs P/yr)=	**0.1181**	<=	**0.1261**	Access rd width(Const)=	24	Crane path width(Const)=	39.5
% of Project Treated for Mill Privilege Pond WS=	**0.00%**	>=	75%	Access rd width(Perm)=	24	Crane path width(Perm)=	39.5
Total Impervious Area for Mill Priviledge Pond WS=	0.07	Acres		Existing NC=	remain as is	Met Tower Rd width=	16

Stone Dam Road

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	Side of road being Tx right, left, both	BMP cover Forest Meadow	Existing Imp Area Width	New Imp. Area (acres)	Imp Area to be Tx (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
Stone Dam Rd	Transport Widen	40210	40475	100%	None	Right			0.0342	0.0342	1	1.75	0.0599	0.0599
Stone Dam Rd	Transport Widen	40940	41090	100%	None	Right			0.0333	0.0333	1	1.75	0.0583	0.0583

Total Impervious **0.068** acres Total Pre Tx Phos **0.1181** lbs P/year Total Post Tx Phos **0.1181** lbs P/year

Project Name	**Weaver Wind**
Project Number	**84176E**
Date	10/23/2018
Done by	JAO

RB=Roadside Buffer
Imp=Impervious area
Land=Landscaped Area

L=Length
W=Width
B=Buffer

REQUIRED BUFFER FLOW PATH LENGTHS
~BUFFER ADJACENT TO DOWN HILL SIDE OF ROAD~

Access/Met Tower Roads

# of Travel Ways to Buffer	Length of Flow Forest	Length of Flow Meadow
1	35	50
2	55	80

Crane Paths

# of Travel Ways to Buffer	Length of Flow Forest	Length of Flow Meadow
1	55	80
2	80	110

* Buffer slopes may not exceed 20%
** Buffers may not be located in a wetland
*** Roadside slopes may be included in a meadow buffer **if** the slope is less than 4:1 **and** if the soils allow infiltration

Spec Pond (OS)

BMP Type & #	Roadway Align. or Turbine Site	Type of Road	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)
RB4	Access/Crane T23	Access	1	Forest	0.40	35	35
RB5	Access/Crane T23	Crane	1	Forest	0.40	55	55
RB8	Access Een Ridge	Access	1	Forest	0.40	35	35
RB9	Access Een Ridge	Access	1	Forest	0.40	35	35
RB10	Access Een Ridge	Access	1	Forest	0.40	35	35
RB11	Access Een Ridge	Access	1	Forest	0.40	35	35
RB13	Crane P Een Ridge	Crane	1	Forest	0.40	55	55
RB14	Crane P Een Ridge	Crane	1	Forest	0.40	55	55
RB15	Crane P Een Ridge	Crane	1	Forest	0.40	55	55
RB17	Weaver Access Rd	Access	1	Forest	0.40	35	35
RB18	Weaver Access Rd	Access	1	Meadow	0.40	50	50
RB19	Weaver Access Rd	Access	1	Meadow	0.40	50	50
RB21	Weaver Access Rd	Access	1	Forest	0.40	35	35
RB26	LBH West Access	Access	1	Meadow	0.40	50	50

RB27	LBH West Access	Access	1	Meadow	0.40	50	50
RB28	LBH West Access	Access	1	Meadow	0.40	50	50
RB29	LBH West Access	Access	1	Forest	0.40	35	35
RB30	LBH West Access	Access	1	Meadow	0.40	50	50
RB31	LBH West Access	Access	1	Meadow	0.40	50	50
RB32	LBH West Access	Access	1	Meadow	0.40	50	50
RB33	LBH West	Crane	1	Forest	0.40	55	55

Spec Pond (EB)

BMP Type & #	Roadway Align. or Turbine Site	Type of Road	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)
RB40	LBH T9	Crane	1	Forest	0.30	55	73
RB40A	LBH T9	Crane	1	Forest	0.30	55	73
RB41	LBH T11	Access	1	Forest	0.30	35	47
RB42	LBH T11	Crane	1	Forest	0.30	55	73
RB43	LBH T11	Crane	1	Forest	0.30	55	73
RB44	LBH T11	Crane	1	Forest	0.30	55	73

Graham Lake

BMP Type & #	Roadway Align. or Turbine Site	Type of Road	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)
RB1	Access/Crane T20	Access	1	Forest	0.40	35	35
RB2	Access/Crane T20	Access	1	Meadow	0.40	50	50
RB3	Access/Crane T23	Access	1	Forest	0.40	35	35
RB7	Access/Crane T24	Access	1	Forest	0.40	35	35
RB12	Crane P Een Ridge	Crane	1	Forest	0.40	55	55
RB14	Crane P Een Ridge	Crane	1	Forest	0.40	55	55
RB21	Weaver Access Rd	Access	1	Forest	0.40	35	35
RB22	Weaver Access Rd	Access	1	Forest	0.40	35	35
RB34	LBHW	Crane	1	Forest	0.40	55	55
RB35	LBH T6	Access	1	Forest	0.40	35	35
RB36	LBH T6	Access	1	Meadow	0.40	50	50
RB37	LBH T9	Crane	1	Forest	0.40	55	55
RB38	LBH T9	Crane	1	Forest	0.40	55	55
RB39	LBH T9	Crane	1	Forest	0.40	55	55

Project Name **Weaver Wind**
Project Number **84176E**
Date 10/23/2016
Done by JAO

BL=Buffer with a Level Lip Spreade L=Length
Imp=Impervious area W=Width
Land=Landscaped Area B=Buffer
C1=Loamy Sand or Sandy Loam C2=Silt Loam, Clay Loam or Silty Clay Loam

REQUIRED BUFFER FLOW PATH LENGTHS
~BUFFERS WITH LEVEL LIP SPREADERS~

0-8% Buffer Slope

Soils	Length of Flow Thru Buffer (ft)	Berm L for Forested Buffer(ft)		Berm L for Meadow Buffer(ft)	
		Per acre Imp	Per acre Land	Per acre Imp	Per acre Land
A	75	75	25	125	35
	100	65	20	75	25
	150	50	15	60	20
B	75	100	30	150	45
	100	80	25	100	30
	150	65	20	75	25
C1	75	125	35	150	45
	100	100	30	125	35
	150	75	25	100	30
C2	100	150	45	200	60
	150	100	30	150	45
D	150	150	45	200	60

9-15% Buffer Slope

Length of Flow Thru Buffer (ft)	Berm L for Forested Buffer(ft)		Berm L for Meadow Buffer(ft)	
	Per acre Imp	Per acre Land	Per acre Imp	Per acre Land
75	90	30	150	42
100	78	24	90	30
150	60	18	72	24
75	120	36	180	54
100	96	30	120	36
150	78	24	90	30
75	150	42	180	54
100	120	36	150	42
150	90	30	120	36
100	180	54	240	72
150	120	36	180	54
150	180	54	240	72

Spec Pond (Osborn) Watershed

BMP Type & #	Roadway Align. or Turbine Site	Imp (acres)	Buffer Type (forest/meadow)	Treatment Factor	Soil Type	Buffer Slope	Standard Buffer Length (ft) (from table)	L of Berm per ac. imp (from table)	Standard Berm Length (ft)	Adjusted Buffer Length (ft)
BL10	Access/Crane T23	0.5003	Forest	0.4	C	7%	100	100	50	100
BL11	Access/Crane T23	0.1587	Meadow	0.4	C	6%	75	150	24	75
BL22	Access/Crane T24	0.3967	Forest	0.4	C	3%	100	100	40	100
BL23	Access/Crane T24	0.3786	Forest	0.4	C	3%	100	100	38	100
BL24	Access/Crane T24	0.1995	Forest	0.4	C	6%	75	125	25	75
BL25	Access/Crane T24	0.5349	Forest	0.4	C	3%	150	75	40	150
BL26	Access Een Ridge	0.0826	Meadow	0.4	C	7%	75	150	12	75
BL27	Access Een Ridge	0.0895	Forest	0.4	C	16%	75	150	13	75
BL28	Access Een Ridge	0.1102	Forest	0.4	C	12%	75	150	17	75
BL29	Access Een Ridge	0.1377	Forest	0.4	C	17%	75	150	21	75
BL30	Access Een Ridge	0.0689	Forest	0.4	C	7%	75	125	9	75
BL31	Access Een Ridge	0.1653	Forest	0.4	C	12%	100	120	20	100

BL32	Access Een Ridge	0.0758	Forest	0.4	C	11%	75	150	11	75
BL33	Access Een Ridge	0.1377	Forest	0.4	C	9%	75	150	21	75
BL34	Access Een Ridge	0.1377	Forest	0.4	C	9%	75	150	21	75
BL35	Access Een Ridge	0.0689	Forest	0.4	C	10%	75	150	10	75
BL36	Access Een Ridge	0.1102	Forest	0.4	C	8%	75	125	14	75
BL37	Access Een Ridge	0.1664	Forest	0.4	C	13%	100	120	20	100
BL42	Crane P Een Ridge	0.1859	Forest	0.4	C	10%	100	120	22	100
BL43B	T18	0.6977	Forest	0.4	C	6%	150	75	52	150
BL44	Crane P Een Ridge	0.1045	Meadow	0.4	C	8%	75	150	16	75
BL45	Crane P Een Ridge	0.1360	Forest	0.4	C	11%	75	150	20	75
BL46	Crane P Een Ridge	0.0949	Forest	0.4	C	6%	75	125	12	75
BL46A	Weaver Access Rd	0.1846	Forest	0.4	C	9%	75	150	28	75
BL46B	Weaver Access Rd	0.2342	Forest	0.4	C	15%	75	150	35	75
BL47	Weaver Access Rd	0.1143	Forest	0.4	C	14%	75	150	17	75
BL47A	Weaver Access Rd	0.1474	Meadow	0.4	C	29%	75	180	27	75
BL48	Weaver Access Rd	0.2048	Forest	0.4	C	17%	75	150	31	75
BL48A	Weaver Access Rd	0.1217	Forest	0.4	C	5%	75	125	15	75
BL53	Weaver Crane Path	0.3287	Forest	0.4	C	1%	100	100	33	100
BL61	LBH West Access	0.2617	Forest	0.4	C	7%	75	125	33	75
BL62	LBH West Access	0.1791	Forest	0.4	C	15%	100	120	21	100
BL63	LBH West Access	0.1157	Forest	0.4	C	29%	75	150	17	75
BL64	LBH West Access	0.1543	Forest	0.4	C	27%	75	150	23	75
BL65	LBH West Access	0.1350	Meadow	0.4	C	19%	75	150	20	75
BL66	LBH West Access	0.0344	Meadow	0.4	C	18%	75	180	6	75
BL67	LBH West Access	0.1791	Forest	0.4	C	16%	100	120	21	100
BL68	LBH West Access	0.4818	Forest	0.4	C	3%	150	75	36	150
BL69	LBH West	0.1587	Forest	0.4	C	10%	100	120	19	100
BL70	LBH West	0.6121	Forest	0.4	C	6%	150	75	46	150

Spec Pond (Eastbrook) Watershed

							from table	from table		
BMP Type & #	Roadway Align. or Turbine Site	Imp (acres)	Buffer Type (forest/meadow)	Treatment Factor	Soil Type	Buffer Slope	Standard Buffer Length (ft)	L of Berm per ac. imp	Standard Berm Length (ft)	Adjusted Buffer Length (ft)
BL76	LBH T6	0.3030	Forest	0.4	C	11%	100	120	36	100
BL77	LBH T6	0.2755	Forest	0.3	C	8%	100	100	28	133
BL86	LBH T9	0.1270	Forest	0.3	C	12%	75	150	19	100
BL87	LBH T9	0.2834	Forest	0.3	C	7%	100	100	28	133
BL88	LBH T9	0.3605	Meadow	0.3	C	10%	100	150	54	133
BL91	LBH T11	0.4477	Forest	0.3	C	5%	100	100	45	133
BL92	LBH T11	0.5576	Forest	0.4	C	4%	100	100	56	100
BL93	LBH T11	0.2066	Forest	0.3	C	5%	75	125	26	100
BL94	LBH T11	0.5767	Forest	0.3	C	6%	100	100	58	133
BL94A	LBH T11	0.3514	Meadow	0.3	C	6%	100	150	53	133
BL95	LBH T11	0.4194	Meadow	0.3	C	3%	100	125	52	133
BL96	LBH T11	0.2720	Forest	0.3	C	4%	100	100	27	133
BL97	LBH T11	0.2040	Forest	0.3	C	3%	100	100	20	133
BL98	LBH T11	0.1474	Forest	0.3	C	5%	75	125	18	100
BL99	LBH T11	0.4126	Forest	0.3	C	10%	100	120	50	133
BL100	LBH T11	0.1451	Forest	0.3	C	11%	75	150	22	100
BL101	LBH T11	0.4761	Forest	0.3	C	5%	100	100	48	133
BL102	LBH T11	0.0793	Forest	0.3	C	3%	75	125	10	100
BL103	LBH T11	0.1700	Forest	0.3	C	3%	75	125	21	100
BL104	LBH T11	0.3263	Forest	0.3	C	7%	100	100	33	133
BL107	PMT12	0.1423	Meadow	0.3	C	6%	75	150	21	100

Graham Lake Watershed

BMP Type & #	Roadway Align. or Turbine Site	Imp (acres)	Buffer Type (forest/meadow)	Treatment Factor	Soil Type	Buffer Slope	Standard Buffer Length (ft) (from table)	L of Berm per ac. imp (from table)	Standard Berm Length (ft)	Adjusted Buffer Length (ft)
BL1	Access/Crane T20	0.1019	Meadow	0.4	C	6%	75	150	15	75
BL2	Access/Crane T20	0.1221	Forest	0.4	C	5%	75	125	15	75
BL3	Access/Crane T20	0.0923	Forest	0.4	C	3%	75	125	12	75
BL4	MET PMT20	0.3305	Forest	0.4	C	8%	100	100	33	100
BL5	Access/Crane T20	0.1814	Forest	0.4	C	7%	75	125	23	75
BL6	Access/Crane T20	0.1587	Meadow	0.4	B/C	11%	75	150	24	75
BL7	Access/Crane T23	0.2590	Forest	0.4	B/C	5%	100	100	26	100
BL8	Access/Crane T23	0.1488	Forest	0.4	C	8%	75	125	19	75
BL9	Access/Crane T23	0.6134	Forest	0.4	C	6%	150	75	46	150
BL17	Access/Crane T24	0.1501	Forest	0.4	C	20%	75	150	23	75
BL18	Access/Crane T24	0.2410	Forest	0.4	C	14%	100	100	24	100
BL19	Access/Crane T24	0.2204	Forest	0.4	C	8%	75	125	28	75
BL20	Access/Crane T24	0.3168	Meadow	0.4	C	7%	100	125	40	100
BL21	Access/Crane T24	0.2244	Forest	0.4	C	8%	100	100	22	100
BL38	Crane P Een Ridge	0.3627	Forest	0.4	C	5%	100	100	36	100
BL39	Crane P Een Ridge	0.3967	Forest	0.4	C	8%	100	100	40	100
BL40	Crane P Een Ridge	0.4194	Forest	0.4	C	8%	100	100	42	100
BL41	Crane P Een Ridge	0.3400	Forest	0.4	C	7%	75	125	43	75
BL43	Crane P Een Ridge	0.4489	Forest	0.4	C	10%	150	75	34	150
BL49	Weaver Access Rd	0.1956	Meadow	0.4	C	8%	100	100	20	100
BL50	Weaver Access Rd	0.0689	Meadow	0.4	B/C	9%	75	180	12	75
BL51	Weaver Access Rd	0.1102	Meadow	0.4	B/C	11%	75	180	20	75
BL52	Weaver Crane Path	0.4435	Forest	0.4	C	4%	100	100	44	100
BL54	Weaver Crane Path	0.5214	Forest	0.4	C	4%	150	75	39	150
BL55	Weaver Crane Path	0.3627	Forest	0.4	C	2%	100	100	36	100
BL56	Weaver Crane Path	0.5108	Forest	0.4	C	6%	100	100	51	100
BL57	Weaver Crane Path	0.1927	Meadow	0.4	C	3%	75	150	29	75
BL58	MET PMT22/23	0.1028	Forest	0.4	C	6%	100	100	10	100
BL59	MET PMT22/23	0.1563	Meadow	0.4	C	5%	100	125	20	100
BL60	MET PMT15/16	0.2208	Meadow	0.4	C	3%	100	100	22	100
BL71	LBHW	0.1383	Forest	0.4	C	6%	75	125	17	75
BL72	LBHW	0.2154	Forest	0.4	C	7%	100	100	22	100
BL73	LBHW	0.1451	Meadow	0.4	C	6%	75	150	22	75
BL74	LBHW	0.0839	Meadow	0.4	C	6%	75	150	13	75
BL75	T4	0.4549	Forest	0.4	C	7%	150	75	34	150
BL78	LBH T6	0.1653	Forest	0.4	C	8%	75	125	21	75
BL79	LBH T6	0.2135	Forest	0.4	C	9%	75	150	32	75
BL80	LBH T6	0.2300	Forest	0.4	C	7%	75	125	29	75
BL81	LBH T6	0.1267	Forest	0.4	C	5%	75	125	16	75
BL82	LBH T6	0.1102	Meadow	0.4	C	15%	75	150	17	75

BL82B	LBH T9	0.4495	Forest	0.4	C	5%	100	100	45	100
BL83	LBH T6	0.1102	Forest	0.4	C	8%	75	125	14	75
BL83B	LBH T9	0.3400	Forest	0.4	C	9%	100	100	34	100
BL84	LBH T9	0.2743	Forest	0.4	C	12%	75	150	41	75
BL85	LBH T9	0.1927	Forest	0.4	C	7%	100	100	19	100
BL89	LBH T9	0.2797	Forest	0.4	C	12%	100	120	34	100
BL90	LBH T11	0.2479	Forest	0.4	C	5%	100	100	25	100
BL105	MET PMT14	0.2388	Forest	0.4	C	3%	100	100	24	100
BL106	MET PMT14	0.4672	Forest	0.4	C	1%	150	75	35	150

Substation

							from table	from table		
BMP Type & #	Roadway Align. or Turbine Site	Imp (acres)	Buffer Type (forest/meadow)	Treatment Factor	Soil Type	Buffer Slope	Standard Buffer Length (ft)	L of Berm per ac. imp	Standard Berm Length (ft)	Adjusted Buffer Length (ft)
B29	Hancock Sub Access	0.9216	Forest	0.4	C	7%	150	75	69	150

Project Name	**Weaver Wind**	c= 0.2
Project Number	**84176E**	I (10 yr)= 5.2
Date	10/23/2018	
Done by	JAO	

Culvert/Level Spreader Calcs

Q=ciA

North String

Road Name	CL Station	Drainage Area (sq ft)	Drainage Area (acres)	Flow (Q)	Req. Level Spreader Length (ft)	Culvert Diameter (in)	Construct Level Spreader (ft)
Access/Crane T20	1+85	334119	7.7	7.98	31.9	18	N/A
Access/Crane T20	8+25 right	2534	0.1	0.06	0.2	15	N/A
Access/Crane T20	8+25 left	1686	0.0	0.04	0.2	15	N/A
Access/Crane T20	9+00	5955	0.1	0.14	0.6	15	See BL1
Access/Crane T20	14+95	40451	0.9	0.97	3.9	15	See BL4
PMT20	1203+14 left	6772	0.2	0.16	0.6	N/A	5
PMT20	1203+14 right	7528	0.2	0.18	0.7	N/A	5
Access/Crane T23	100+67	173769	4.0	4.15	16.6	15	N/A
Access/Crane T23	102+45	280180	6.4	6.69	26.8	18	See BL7
Access/Crane T23	107+05	160366	3.7	3.83	15.3	15	See BL8
Access/Crane T23	108+40 right	2885	0.1	0.07	0.3	15	N/A
Access/Crane T23	110+40	613700	14.1	14.65	58.6	24	See BL9
Access/Crane T23	110+60 left	613700	14.1	14.65	58.6	24	N/A
Access/Crane T23	119+75	254651	5.8	6.08	24.3	18	See BL10
Access/Crane T23	120+50 right	13404	0.3	0.32	1.3	15	5
Access/Crane T23	122+40	181030	4.2	4.32	17.3	15	18
Access/Crane T23	126+36	51823	1.2	1.24	4.9	15	See BL11
Access/Crane T23	134+09 right	162640	3.7	3.88	15.5	N/A	16
Access/Crane T23	T23 (east)	162640	3.7	3.88	15.5	15	N/A
PMT 22/23	1220+06	86351	2.0	2.06	8.2	15	9
PMT 22/23	1228+11 right	47995	1.1	1.15	4.6	N/A	5
Access/Crane T24	242+00	534206	12.3	12.75	51.0	24	See BL17
Access/Crane T24	247+20	66464	1.5	1.59	6.3	15	See BL18
Access/Crane T24	247+50 right	541150	12.4	12.92	51.7	24	2-26'
Access/Crane T24	251+50	61339	1.4	1.46	5.9	15	See BL19
Access/Crane T24	254+30 left	61339	1.4	1.46	5.9	15	N/A
Access/Crane T24	255+47	71324	1.6	1.70	6.8	15	See BL20
Access/Crane T24	265+00	16534	0.4	0.39	1.6	15	N/A
Access/Crane T24	270+70	41691	1.0	1.00	4.0	15	See BL22
Access/Crane T24	271+75	3404	0.1	0.08	0.3	15	N/A
Access/Crane T24	275+00	18074	0.4	0.43	1.7	15	See BL23

Weaver/Een Ridge

Road Name	CL Station	Drainage Area (sq ft)	Drainage Area (acres)	Flow (Q)	Req. Level Spreader Length (ft)	Culvert Diameter (in)	Construct Level Spreader (ft)
Spec Pond Road	220' left	1337604	30.7	31.94	127.7	36	N/A
Access Een Ridge	300+78	879255	20.2	20.99	84.0	30	N/A
Access Een Ridge	310+00 left	413506	9.5	9.87	39.5	24	N/A
Access Een Ridge	329+00	68126	1.6	1.63	6.5	15	See BL37
Crane Een Ridge	408+94	63333	1.5	1.51	6.0	15	See BL38
Crane Een Ridge	413+35	15113	0.3	0.36	1.4	15	See BL39

Crane Een Ridge	415+65	169707	3.9	4.05	16.2	15	See BL40
Crane Een Ridge	416+25 right	5852	0.1	0.14	0.6	15	See BL40
Crane Een Ridge	418+00	7123	0.2	0.17	0.7	15	See BL41
Crane Een Ridge	419+25	7123	0.2	0.17	0.7	15	N/A
Crane Een Ridge	421+95	10702	0.2	0.26	1.0	15	See BL42
Crane Een Ridge	425+10	19953	0.5	0.48	1.9	15	See BL43
Crane Een Ridge	429+00 right	5357	0.1	0.13	0.5	15	N/A
Crane Een Ridge	431+50 left	34054	0.8	0.81	3.3	15	5
Crane Een Ridge	438+44	17222	0.4	0.41	1.6	15	See BL43B
Weaver Access Rd	507+50	16520	0.4	0.39	1.6	15	See BL46A
Weaver Access Rd	511+75	20193	0.5	0.48	1.9	15	See BL46B
Weaver Access Rd	517+10	250455	5.7	5.98	23.9	18	See BL47A
Weaver Access Rd	518+25 right	94883	2.2	2.27	9.1	15	N/A
Weaver Access Rd	520+50	240876	5.5	5.75	23.0	18	See BL47
Weaver Access Rd	525+40	733357	16.8	17.51	70.0	30	See BL48
Weaver Access Rd	527+50	139025	3.2	3.32	13.3	15	See BL48A
Weaver Access Rd	530+80 right	5644	0.1	0.13	0.5	N/A	5
Weaver Access Rd	530+40	77610	1.8	1.85	7.4	15	8
Weaver Access Rd	541+40	178584	4.1	4.26	17.1	15	See BL49
Weaver Access Rd	545+02	31399	0.7	0.75	3.0	15	See BL51
Weaver Crane Rd	600+65	112697	2.6	2.69	10.8	15	11
Weaver Crane Rd	614+10	175458	4.0	4.19	16.8	15	N/A
Weaver Crane Rd	618+50 left	40111	0.9	0.96	3.8	15	N/A
Weaver Crane Rd	622+75	76525	1.8	1.83	7.3	15	See BL55
Weaver Crane Rd	628+50 right	198912	4.6	4.75	19.0	15	N/A
Weaver Crane Rd	End of T14	314983	7.2	7.52	30.1	18	N/A
PMT 15/16	1150+28	157943	3.6	3.77	15.1	15	N/A
PMT 14	1140+18	34553	0.8	0.82	3.3	15	N/A
PMT 14	1145+05	10145	0.2	0.24	1.0	15	See BL105
PMT 14	1150+00 right	11875	0.3	0.28	1.1	15	N/A
PMT 14	1152+00	200893	4.6	4.80	19.2	15	See BL106
PMT 14	End of Road	19642	0.5	0.47	1.9	N/A	5

Little Bull Hill West

Road Name	CL Station	Drainage Area (sq ft)	Drainage Area (acres)	Flow (Q)	Req. Level Spreader Length (ft)	Culvert Diameter (in)	Construct Level Spreader (ft)
Access LBH West	706+20	539072	12.4	12.87	51.5	24	See BL61
Access LBH West	709+00	30539	0.7	0.73	2.9	15	See BL62
Access LBH West	712+80	9100	0.2	0.22	0.9	15	See BL63
Access LBH West	715+10	193822	4.4	4.63	18.5	15	19
Access LBH West	716+00	487228	11.2	11.63	46.5	24	See BL64
Access LBH West	718+83	20795	0.5	0.50	2.0	15	See BL65
Access LBH West	723+50	13340	0.3	0.32	1.3	15	See BL67
Access LBH West	735+18	39999	0.9	0.95	3.8	15	N/A

Little Bull Hill

Road Name	CL Station	Drainage Area (sq ft)	Drainage Area (acres)	Flow (Q)	Req. Level Spreader Length (ft)	Culvert Diameter (in)	Construct Level Spreader (ft)
Access LBH T6	802+50	199044	4.6	4.75	19.0	15	N/A
Access LBH T6	803+57	515000	11.8	12.30	49.2	24	See BL76
Access LBH T6	809+00	506629	11.6	12.10	48.4	24	See BL77
Access LBH T6	814+10	309275	7.1	7.38	29.5	18	See BL78
Access LBH T6	817+00	260881	6.0	6.23	24.9	18	See BL79
Access LBH T6	819+95	568306	13.0	13.57	54.3	24	See BL80
Access LBH T6	827+55	117277	2.7	2.80	11.2	15	See BL81
Access LBH T6	833+00 right	150550	3.5	3.59	14.4	15	See BL82
Access LBH T6	833+50 left	362847	8.3	8.66	34.7	24	N/A
Access/Crane LBH T9	856+25	495793	11.4	11.84	47.3	24	See BL82B

Access/Crane LBH T9	857+00 left	495793	11.4	11.84	47.3	24	N/A
Access/Crane LBH T9	864+55	317095	7.3	7.57	30.3	18	N/A
Access/Crane LBH T9	868+25 left	217764	5.0	5.20	20.8	15	N/A
Access/Crane LBH T9	869+78	21953	0.5	0.52	2.1	15	See BL84
Access/Crane LBH T9	877+50	4653	0.1	0.11	0.4	15	N/A
Access/Crane LBH T9	883+50	71295	1.6	1.70	6.8	15	N/A
Access/Crane LBH T9	888+67	295123	6.8	7.05	28.2	18	See BL88
Access LBH T11	907+46	19102	0.4	0.46	1.8	15	See BL89
Access LBH T11	912+00	24205	0.6	0.58	2.3	15	See BL90
Access LBH T11	921+50	34832	0.8	0.83	3.3	15	See BL91
Access LBH T11	928+56	33537	0.8	0.80	3.2	15	See BL92
Access LBH T11	943+50	14612	0.3	0.35	1.4	15	See BL93
Access LBH T10	950+30	68795	1.6	1.64	6.6	15	N/A
Access LBH T10	953+35 right	8978	0.2	0.21	0.9	N/A	5
Access LBH T10	955+55 right	134708	3.1	3.22	12.9	N/A	13
PMT 12	1112+11	24758	0.6	0.59	2.4	15	5
PMT 12	1122+50	34989	0.8	0.84	3.3	15.0	See BL107
Crane Path LBH T13	1001+75	102459	2.4	2.45	9.8	15	N/A
Crane Path LBH T13	1009+00 left	3367	0.1	0.08	0.3	15	N/A
Crane Path LBH T13	1009+25 right	7634	0.2	0.18	0.7	15	N/A
Crane Path LBH T13	1012+75	27222	0.6	0.65	2.6	15	See BL95
Crane Path LBH T13	1016+04	124071	2.8	2.96	11.8	15	N/A
Crane Path LBH T13	1016+40 right	138046	3.2	3.30	13.2	15	N/A
Crane Path LBH T13	1017+75 left	146563	3.4	3.50	14.0	15	N/A
Crane Path LBH T13	1020+24	264824	6.1	6.32	25.3	18	See BL97
Crane Path LBH T13	1023+00	80054	1.8	1.91	7.6	15	See BL98
Crane Path LBH T13	1027+58	214178	4.9	5.11	20.5	15	See BL99
Crane Path LBH T13	1030+50	179689	4.1	4.29	17.2	15	See BL100
Crane Path LBH T13	1035+85	28873	0.7	0.69	2.8	15	See BL101
Crane Path LBH T13	1038+12	145355	3.3	3.47	13.9	15	See BL103
Crane Path LBH T13	1039+50	87468	2.0	2.09	8.4	15	9

Substation

Road Name	CL Station	Drainage Area (sq ft)	Drainage Area (acres)	Flow (Q)	Req. Level Spreader Length (ft)	Culvert Diameter (in)	Construct Level Spreader (ft)
Access RD	1+43	436020	10.0	10.41	41.6	24	2-22
Hancock Access (exist)	0+20	50444	1.2	1.20	4.8	15	See B29

Exhibit 12-3

Forested Buffer Restrictions

DECLARATION OF RESTRICTIONS
(Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20__, by **WEAVER WIND, LLC**, a Delaware limited liability company having a mailing address of c/o Longroad Energy, 133 Federal Street, 12th Floor, Boston, MA 02110 (herein referred to as the "Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve buffer areas on certain parcels of land in _____, Hancock County, Maine.

WHEREAS, the Declarant is the developer of a certain wind power project constructed on lands located in _____, Hancock County, Maine (the "Project") in accordance with Maine Department of Environmental Protection Order #_____ dated _____, and as further revised (the "Order");

WHEREAS, the Declarant is the owner of certain leasehold and easement interests pursuant to certain agreements identified on the attached EXHIBIT A, all recorded at the Hancock County Registry of Deeds as set forth on the attached EXHIBIT A (the "Project Area Interests"), pursuant to which Project Area Interests the Declarant controls certain real property necessary for the Project situated in _____, Hancock County, Maine described in the recorded instruments specified on the attached EXHIBIT A, herein referred to as the "property"; and

WHEREAS, pursuant to Condition ___ of the Order, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows:

> Those areas shown as "Restricted Buffer Areas" on the plans attached hereto as EXHIBIT B, which areas all are marked/flagged in the field.

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein during the term hereof. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner or occupant of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped for the term of this Declaration. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

    a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

    b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following definition of general forest use:

        (i) The land must be maintained in essentially forest cover with undisturbed soil, duff layer and ground cover vegetation, and understory vegetation. Timber may be harvested on a selective basis provided that no more than 40% of the volume is harvested within any 10 year period.

    c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole, guy wires and anchors, or fence;

    d. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

    Any activity on or use of the Restricted Buffer Area during the term of this Declaration that is inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area during the term of this Declaration must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Term; Binding Effect. The term of this Declaration shall expire upon the decommissioning of the Project as described in the Order. The restrictions set forth herein shall be binding on any present or future owner or occupant of the Restricted Buffer Area during the term hereof. If the Restricted Buffer Area is at any time owned or leased by more than one owner/occupant, each owner/occupant shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner/occupant's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the holder of the Project Area Interests and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall

be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area during the term hereof.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

WEAVER WIND, LLC

By:_____
Print:_____
Its:_____

STATE OF _____ _____, 20__
COUNTY OF _____

Personally appeared before me the above named _____, _____ of Weaver Wind, LLC, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed and the free act and deed of said company.

_____
Notary Public

_____

EXHIBIT A

Project Area Interests

1. Easement interests:

2. Leasehold interests:

EXHIBIT B
(Plans of Restricted Buffer)

Exhibit 12-4

Meadow Buffer Restrictions

DECLARATION OF RESTRICTIONS
(Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20__, by **WEAVER WIND, LLC**, a Delaware limited liability company having a mailing address of c/o Longroad Energy, 133 Federal Street, 12th Floor, Boston, MA 02110 (herein referred to as the "Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve buffer areas on certain parcels of land in _____, Hancock County, Maine.

WHEREAS, the Declarant is the developer of a certain wind power project constructed on lands located in _____, Hancock County, Maine (the "Project") in accordance with Maine Department of Environmental Protection Order #_____ dated _____, and as further revised (the "Order");

WHEREAS, the Declarant is the owner of certain leasehold and easement interests pursuant to certain agreements identified on the attached EXHIBIT A, all recorded at the Hancock County Registry of Deeds as set forth on the attached EXHIBIT A (the "Project Area Interests"), pursuant to which Project Area Interests the Declarant controls certain real property necessary for the Project situated in _____, Hancock County, Maine described in the recorded instruments specified on the attached EXHIBIT A, herein referred to as the "property"; and

WHEREAS, pursuant to Condition ___ of the Order, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows:

> Those areas shown as "Restricted Buffer Areas" on the plans attached hereto as EXHIBIT B, which areas all are marked/flagged in the field.

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein during the term hereof. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner or occupant of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped for the term of this Declaration. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

    a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

    b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.

    c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole, guy wires and anchors, or fence;

    d. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

    Any activity on or use of the Restricted Buffer Area during the term of this Declaration that is inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area during the term of this Declaration must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Term; Binding Effect. The term of this Declaration shall expire upon the decommissioning of the Project as described in the Order. The restrictions set forth herein shall be binding on any present or future owner or occupant of the Restricted Buffer Area during the term hereof. If the Restricted Buffer Area is at any time owned or leased by more than one owner/occupant, each owner/occupant shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner/occupant's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the holder of the Project Area Interests and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area during the term hereof.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

WEAVER WIND, LLC

By:_____
Print:_____
Its:_____

STATE OF _____ _____, 20__
COUNTY OF _____

Personally appeared before me the above named _____, _____ of Weaver Wind, LLC, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed and the free act and deed of said company.

_____
Notary Public

_____

EXHIBIT A

Project Area Interests

1. Easement interests:

2. Leasehold interest:

EXHIBIT B
(Plans of Restricted Buffer)