

**Attachment 3**  
**Pollutant Loading Analysis**

A pollutant loading analysis was completed for the project using the SIMPLE method spreadsheet model developed by NHDES (form: NHDES-W-07-055). The project was evaluated for each of 5 primary subwatersheds in which project developments are proposed. Land cover types were determined from existing site conditions and proposed development features. The project includes 585 acres of total drainage area within the proposed stormwater management area, currently 2.31% of which is impervious (13.5 acres) proposed to increase to 4.52% impervious area (26.45 acres). Stormwater from the site is currently managed using conventional drainage and the proposed project includes the use of infiltration BMPs to manage and treat stormwater prior to discharge. The SIMPLE model evaluates net increase/decrease of three pollutants of concern: total suspended solids, total phosphorus, and total nitrogen. Based on analysis with the SIMPLE model, the proposed project will have a net decrease from the five combined subwatershed areas of: -3,876 lbs. of TSS and -11 lbs. of total nitrogen. There will be an estimated net increase of 1 lb. of total phosphorus.

The objective of the Pollutant Loading Analysis is to preferably show no net increase of pollutants as a result of the proposed project; however, the SIMPLE method spreadsheet model used for the analysis of this project shows an estimated net increase of 1 lb of total phosphorus. The 1 lb. increase in total phosphorus is expected to be essentially a de minimis effect on the environment and the proposed stormwater management system is demonstrated to be effective in minimizing the contribution of pollutants to the environment.

To understand the effect of 1 pound of total phosphorus added to the environment each year at the project site, it is necessary to compare it to the existing condition and the relative change in conditions as a result of the activity. The 1 pound of total phosphorus is equal to 0.45 kg or 455,000 mg per year. The annual precipitation at the site is 40 inches or 1.02 m per year. This translates to an annual runoff volume (assuming a runoff fraction of 0.9) of 2.2 billion liters per year for the 585-acre site. The resulting stormwater discharge would therefore increase in total phosphorus concentration by  $\sim 0.0002$  mg/l as an annual average compared to the pre-build condition. Receiving waters in the watershed were found to have an average total phosphorus concentration of  $\sim 0.019$  mg/L and therefore the average annual effect of the proposed discharge would be a 1% or less increase in the average total phosphorus concentration at the points of discharge to surface waters. These effects would decrease proportionally with distance from the points of discharge as stormwater is diluted in receiving waters. Therefore, it is reasonable to consider the negligible net increase in total phosphorus as a result of the activity to be a de minimis condition that is consistent with the objective of demonstrating no net increase in pollutants as a result of the proposed activity.

The results of the pollutant loading analysis are provided in the following pages. Five subwatershed areas were identified for stormwater management and the results of each subwatershed pollutant loading analysis are provided individually. The original SIMPLE Method Spreadsheet model files are provided separately for review.

Subcatchment	Post-development Area (acres)	TSS Pre-development load (Lb/year)	TP Pre-development Load (Lb/year)	TN Pre-development Load (Lb/year)
A	176.53	5,101.0	14.0	181.0
B	81.74	2,951.8	7.7	103.5
C	270.74	8,018.5	24.2	289.7
D	27.66	1,336.1	4.7	49.4
E	28.53	2,653.2	9.3	85.4
<b>Total</b>	<b>585.2</b>	<b>20,060.6</b>	<b>59.9</b>	<b>709</b>
Subcatchment	Post-development Area (acres)	TSS Post-development load (Lb/year)	TP Post-development Load (Lb/year)	TN Post-development Load (Lb/year)
A	176.53	4,717.3	14.3	177.0
B	81.74	1,867.3	6.6	79.8
C	270.74	6,000.6	25.2	303.3
D	27.66	1,228.8	5.5	56.3
E	28.53	2,370.6	9.5	82.0
<b>Total</b>	<b>585.2</b>	<b>16,184.6</b>	<b>61.1</b>	<b>698.4</b>
Subcatchment	Post-development Area (acres)	TSS net change (Lb/year)	TP net change (Lb/year)	TN net change (Lb/year)
A	176.53	-383.7	0.3	-4.0
B	81.74	-1,084.5	-1.2	-23.7
C	270.74	-2,018.0	0.9	13.7
D	27.66	-107.3	0.8	6.9
E	28.53	-282.6	0.2	-3.4
<b>Total</b>	<b>585.2</b>	<b>-3,876.1</b>	<b>1.0</b>	<b>-10.5</b>

	A	B	C	D	E	J
1	Date (MM/DD/YYYY):	8/21/2023				
2	Project Name:	Granite State Landfill				
3	Town/City:	Dalton, NH				
4	Impacted Surface Waters:	Ammonoosuc River				
5	Applicant:	Granite State Landfill, LLC				
6	DES File #:	NA				
7						
8	TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	182.05				
9	TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	2.36				
10	TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	1.3%				
11						
12	TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	176.53				
13	TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	3.39				
14	TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	1.9%				
15	TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00				
16	TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%				
17						
18						
19			TSS	TP	TN	
20	PRE DEVELOPMENT LOADS (NO BMPS)		(LBS/YR)	(LBS/YR)	(LBS/YR)	
21	PRE DEVELOPMENT LOADS (WITH BMPS)		5101.0	14.0	181.0	
22	PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPS		0.0	0.0	0.0	
23						
24	PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE		NA	0.0%	0.0%	
25	POST DEVELOPMENT LOADS (NO BMPS)		5578.1	16.3	200.0	
26	POST DEVELOPMENT LOADS (WITH BMPS)		4717.3	14.3	177.0	
27	POST DEVELOPMENT LOAD REDUCTION DUE TO BMPS		860.8	2.0	23.0	
28						
29	POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)		-383.7	0.3	-4.0	
30	% DIFFERENCE FROM PRE DEVELOPMENT LOADS (SHOULD BE 0 OR NEGATIVE)		-7.5%	2.3%	-2.2%	
31						
32	TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD		8.6%	14.3%	9.5%	
33						
34						
35	2020-03-02		(603) 271-2304 PO Box 95, Concord, NH 03302-0095 www.des.nh.gov			Tab 6 of 9
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Subcatchment A – SIMPLE Model Summary

	A	B	C	D	E	J
1	Date (MM/DD/YYYY):	8/21/2023				
2	Project Name:	Granite State Landfill				
3	Town/City:	Dalton, NH				
4	Impacted Surface Waters:	Ammonoosuc River				
5	Applicant:	Granite State Landfill, LLC				
6	DES File #:	NA				
7						
8	TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	112.93				
9	TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	1.06				
10	TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	0.9%				
11						
12	TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	81.74				
13	TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	2.14				
14	TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	2.6%				
15	TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00				
16	TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%				
17						
18						
19			TSS	TP	TN	
20	PRE DEVELOPMENT LOADS (NO BMPS)		(LBS/YR)	(LBS/YR)	(LBS/YR)	
21	PRE DEVELOPMENT LOADS (WITH BMPS)		2951.8	7.7	103.5	
22	PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPS		0.0	0.0	0.0	
23						
24	PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE		NA	0.0%	0.0%	
25	POST DEVELOPMENT LOADS (NO BMPS)		2925.1	9.0	105.5	
26	POST DEVELOPMENT LOADS (WITH BMPS)		1867.3	6.6	79.8	
27	POST DEVELOPMENT LOAD REDUCTION DUE TO BMPS		1057.8	2.5	25.6	
28						
29	POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)		-1084.5	-1.2	-23.7	
30	% DIFFERENCE FROM PRE DEVELOPMENT LOADS (SHOULD BE 0 OR NEGATIVE)		-36.7%	-14.9%	-22.9%	
31						
32	TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD		-0.9%	14.5%	1.8%	
33						
34						
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Subcatchment B – SIMPLE Model Summary

	A	B	C	D	E	J
1	Date (MM/DD/YYYY):	8/21/2023				
2	Project Name:	Granite State Landfill				
3	Town/City:	Dalton, NH				
4	Impacted Surface Waters:	Ammonoosuc River				
5	Applicant:	Granite State Landfill, LLC				
6	DES File #:	NA				
7						
8	TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	236.96				
9	TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	5.52				
10	TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	2.3%				
11						
12	TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	270.74				
13	TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	13.59				
14	TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	5.0%				
15	TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00				
16	TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%				
17						
18						
19			TSS	TP	TN	
20	PRE DEVELOPMENT LOADS (NO BMPs)		(LBS/YR)	(LBS/YR)	(LBS/YR)	
21	PRE DEVELOPMENT LOADS (WITH BMPs)		8018.5	24.2	289.7	
22	PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPs		0.0	0.0	0.0	
23						
24	PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE		NA	0.0%	0.0%	
25	POST DEVELOPMENT LOADS (NO BMPs)		13148.3	45.3	488.5	
26	POST DEVELOPMENT LOADS (WITH BMPs)		6000.6	25.2	303.3	
27	POST DEVELOPMENT LOAD REDUCTION DUE TO BMPs		7147.7	20.1	185.2	
28						
29	POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)		-2018.0	0.9	13.7	
30	% DIFFERENCE FROM PRE DEVELOPMENT LOADS (SHOULD BE 0 OR NEGATIVE)		-25.2%	3.8%	4.7%	
31						
32	TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD		39.0%	46.4%	40.7%	
33						
34						
35	2020-03-02		(603) 271-2304 PO Box 95, Concord, NH 03302-0095 www.des.nh.gov			Tab 6 of 9
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Subcatchment C – SIMPLE Model Summary

	A	B	C	D	E	J
1	Date (MM/DD/YYYY):	8/21/2023				
2	Project Name:	Granite State Landfill				
3	Town/City:	Dalton, NH				
4	Impacted Surface Waters:	Ammonoosuc River				
5	Applicant:	Granite State Landfill, LLC				
6	DES File #:	NA				
7						
8	TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	24.81				
9	TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	1.43				
10	TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	5.8%				
11						
12	TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	27.66				
13	TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	2.81				
14	TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	10.2%				
15	TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00				
16	TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%				
17						
18						
19			TSS	TP	TN	
20	PRE DEVELOPMENT LOADS (NO BMPS)		(LBS/YR)	(LBS/YR)	(LBS/YR)	
21	PRE DEVELOPMENT LOADS (WITH BMPS)		1336.1	4.7	49.4	
22	PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPS		0.0	0.0	0.0	
23						
24	PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE		NA	0.0%	0.0%	
25	POST DEVELOPMENT LOADS (NO BMPS)		2187.9	8.3	82.1	
26	POST DEVELOPMENT LOADS (WITH BMPS)		1228.8	5.5	56.3	
27	POST DEVELOPMENT LOAD REDUCTION DUE TO BMPS		959.1	2.8	25.8	
28						
29	POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)		-107.3	0.8	6.9	
30	% DIFFERENCE FROM PRE DEVELOPMENT LOADS (SHOULD BE 0 OR NEGATIVE)		-8.0%	16.3%	14.0%	
31						
32	TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD		38.9%	43.3%	39.9%	
33						
34						
35	2020-03-02		(603) 271-2304	PO Box 95, Concord, NH 03302-0095	www.des.nh.gov	Tab 6 of 9
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Subcatchment D – SIMPLE Model Summary

	A	B	C	D	E	J
1	Date (MM/DD/YYYY):	8/21/2023				
2	Project Name:	Granite State Landfill				
3	Town/City:	Dalton, NH				
4	Impacted Surface Waters:	Ammonoosuc River				
5	Applicant:	Granite State Landfill, LLC				
6	DES File #:	NA				
7						
8	TOTAL PRE -DEVELOPMENT (PRE-DEV) AREA (ACRES) =	28.53				
9	TOTAL PRE-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	3.13				
10	TOTAL PRE-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	11.0%				
11						
12	TOTAL POST DEVELOPMENT (POST-DEV) AREA (ACRES) =	28.53				
13	TOTAL POST-DEV EFFECTIVE IMPERVIOUS AREA (ACRES) =	4.52				
14	TOTAL POST-DEV PERCENT EFFECTIVE IMPERVIOUS (%) =	15.8%				
15	TOTAL POST-DEV AREA THAT IS FERTILIZED ANNUALLY (ACRES) =	0.00				
16	TOTAL POST-DEV PERCENT OF AREA THAT IS FERTILIZED ANNUALLY (%) =	0.0%				
17						
18						
19			TSS	TP	TN	
20	PRE DEVELOPMENT LOADS (NO BMPS)		(LBS/YR)	(LBS/YR)	(LBS/YR)	
21	PRE DEVELOPMENT LOADS (WITH BMPS)		2653.2	9.3	85.4	
22	PRE DEVELOPMENT LOAD REDUCTION DUE TO BMPS		0.0	0.0	0.0	
23						
24	PROPOSED PERCENT REDUCTION IN FERTILIZER APPLICATION RATE		NA	0.0%	0.0%	
25	POST DEVELOPMENT LOADS (NO BMPS)		3702.7	13.4	118.2	
26	POST DEVELOPMENT LOADS (WITH BMPS)		2370.6	9.5	82.0	
27	POST DEVELOPMENT LOAD REDUCTION DUE TO BMPS		1332.1	3.9	36.2	
28						
29	POST DEVELOPMENT - PRE DEVELOPMENT (SHOULD BE 0 OR NEGATIVE)		-282.6	0.2	-3.4	
30	% DIFFERENCE FROM PRE DEVELOPMENT LOADS (SHOULD BE 0 OR NEGATIVE)		-10.7%	1.9%	-4.0%	
31						
32	TOTAL REMOVAL EFFICIENCY NEEDED TO MEET PRE-DEVELOPMENT LOAD		28.3%	30.6%	27.7%	
33						
34						
35	2020-03-02		(603) 271-2304			
36			PO Box 95, Concord, NH 03302-0095			
			www.des.nh.gov			Tab 6 of 9

Subcatchment E – SIMPLE Model Summary