APPENDICES



APPENDIX A: LETTER TO VILLAGE OF ENOSBURG FALLS



October 15, 2009

Gary Atherton Public Works Director Village of Enosburg Falls 42 Village Drive Enosburg Falls, VT 05478

SEI No. 082119-W RE: Enosburg Falls IDDE results to date



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

Dear Gary:

This letter is to summarize the results of the illicit discharge detection and elimination project in Enosburg Falls to date. We apologize for the delay in getting these data to you. I've also sent a copy of this letter to Brian Ovitt.

The initial assessment in June of all the stormwater outfalls pointed towards six discharge points with potential contamination warranting further investigation. These are identified in Table 1 below. See Table 4 for supporting data.

Table 1: Disch	arge points with contaminated dry weather flows in initia	l assessment (June)
Structure ID	Location	Contaminant detected
EN-040	Concrete structure on north side Missisquoi Street east	Ammonia (high), fluoride
	of cemetery	
EN-100	Outfall on north side of bike path (rail trail) off Bismark	Optical brightener; detergents
	Street	(high)
EN-160	Outfall discharging below grade into a hole on the north	Optical brightener; detergents
	side of the bridge on Pearl Street east of the Mobil	
	station	
EN-210	Outfall from central municipal drainage system,	Ammonia; detergents (low)
	discharging from Main Street to Missisquoi River 200	
	feet north of the Hwy 108 bridge	
EN-280	Manhole in grass up-pipe from outfall EN-230 (which	Fluoride
	was buried) near bend in Dickinson Avenue	
EN-360	Outfall below wastewater treatment plant	Optical brightener; ammonia
		(low)

Much of the downtown area is drained by the stormsewer that runs below Main Street and discharges to the Missisquoi River from outfall EN-210 200 feet north of the West Enosburg Road (Hwy 108) bridge. During the June assessment, samples were also collected at several manholes along this stormsewer line. June results for these assessment points are summarized in Table 2 below:

Table 2: Manholes sampled in the initial assessment (June) of the Main Street stormsewer

(discharging at outfall EN-210)				
Structure ID	Location	Contaminant detected		
EN-300	Manhole at intersection of Stebbins and School streets	Ammonia; detergents (high)		
EN-310	Manhole at intersection of Pleasant and Missisquoi streets	Insufficient flow to sample		
EN-320	Manhole at intersection of Depot and Archambault	Optical brightener; ammonia		
	streets	(low); detergents (low)		
EN-330	Manhole at intersection of Main and Bismark streets	Ammonia (low)		
EN-340	Manhole at intersection of Main Street and Dickinson	Optical brightener; ammonia		
	Avenue	(low); detergents		

The initial results suggest that several discharge points—EN-100, EN-160, EN-210, and EN-360—are contaminated by small flows of sanitary wastewater. This includes the Main Street stormsewer which discharges at outfall EN-210. Additionally, elevated fluoride was detected at the manhole at the bend in Dickinson Avenue (EN-280) in June, suggesting that drinking water was entering or infiltrating the stormsewer line.

In September, 2009, we tested dry weather flows at the outfalls listed in Table 1 for *E. coli* and total phosphorus. These data are presented in Table 4. With the Town's assistance, we also sampled dry weather flows at access points (manholes and catchbasins) up-pipe from the outfalls listed in Table 1 to try to isolate contaminant sources between structures. In general, we tested for the same contaminants as we detected in the June assessment. Where possible, we collected samples from inflowing stormlines rather than manhole and catchbasin sumps. The results of these stormsewer investigations are provided on the attached maps and schematics.

Unfortunately, tracing contaminants within the stormsewers was not as successful as expected. In three cases (EN-40, EN-100, and EN-160) concentrations of ammonia and/or detergents at the outfall were

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well below what we found in June, so isolating contaminant sources within the stormsewer was difficult. Why levels of ammonia and detergents declined between the June assessment and the September follow-up investigations is not known, although it is likely that infiltration of contaminated groundwater into the stormsewer was greater in June due to higher groundwater levels in June than in September.

The following is our summary regarding the presence of illicit discharges in Ensoburg Falls, considering the June and September data. I've included recommendations for further investigation, where warranted.

Table 3: Investigation of discharge points with contaminated dry weather flows				
Structure ID	Location	Contaminant detected		
EN-040	Concrete structure on north side Missisquoi Street	June: Ammonia (high), fluoride		
	east of cemetery			
September inve	estigation:			
A sample collected at the outfall on 9/3 had a low <i>E. coli</i> level (60 MPN/100 mL). On 9/7, ammonia and				
fluoride levels were below detection at the structure, therefore no further investigation was done.				
Recommendation:				
This may be an intermittent discharge. We recommend retesting flows for ammonia at a later date and				
attempting to trace any detection up the channel to the source. Note that one area of interest is the facility				
at the end of Depot Street. At this facility, the Department of Environmental Conservation's stormwater				
mapping shows	s an outfall discharging to the channel upslope from t	he EN-040 monitoring point. This		
outfall was not	sampled because the surrounding land is posted.			
EN-100	Outfall on north side of bike path (rail trail) off	June: Optical brightener; detergents		
	Bismark Street	(high)		
September inve	estigation:			
A sample collected at the outfall on 9/3 had a low <i>E. coli</i> level (100 MPN/100 mL). On 9/24, flow was				
observed in the second catchbasin (EN-102) up the stormline from the outfall, continuing to the outfall.				
There was no flow at Main Street. No ammonia or detergents were detected at the outfall. However,				
optical brightener was definitely present at the outfall and at the first catchbasin up the line. Optical				
brightener was	not found in the second catchbasin up the line. There	efore we suspect a sanitary wastewater		
or washwater c	onnection between the first and second catchbasin up	the line from the outfall.		
Recommendati	on:			
We recommend	d inspection of the stormsewer line between the first a	nd second catchbasin up from the		

outfall using a closed circuit television camera. The line will need to be cleaned prior to inspection.				
EN-160	Outfall discharging below grade into a hole on the June: Optical brightener; detergents			
	north side of the bridge on Pearl Street east of the			
	Mobil station			
September investigation:				
A sample colled	tted at the outfall on 9/3 had a low <i>E. coli</i> level (160 M	IPN/100 mL). A sample collected on		
9/24 had ammonia and detergents below the detection levels.				
Recommendati	on:			
We recommend	d retesting this outfall periodically after the planned s	anitary sewer connection is made at		
the Mobil station	on.			
EN-210	Outfall from central municipal drainage system,	June: Ammonia; detergents (low)		
	discharging from Main Street to Missisquoi River			
	200 feet north of the Hwy 108 bridge			
September investigation:				
A sample collected on 9/3 at the outfall had <i>E. coli</i> > 4,000 MPN/100 mL. Based on this result, on $9/17$				
samples were c	ollected for <i>E. coli</i> analysis in a portion of the contribu	uting stormsewer. On 9/17, the level		
was 6 500 E coli /100 mL at the outfall indicating sanitary wastewater contamination. At the intersection				

was 6,500 *E. coli* /100 mL at the outfall, indicating sanitary wastewater contamination. At the intersection of Main St. and Pearl St., flow in the Main St. line had 2,000 *E. coli* /100 mL and a trickle of flow from the Pearl St. line was not sampled. Up Main St. at the intersection of Dickinson St., there was no flow from the Dickinson St. line, but flow down the Main St. line had 10,000 *E. coli* /100 mL. Further up Main St. at the intersection of School St., flow from the Main St. line had 12,000 *E. coli* /100 mL while flow from the School St. line had 2,200 *E. coli*/100 mL. Up School St. at the intersection with Stebbins St., the only inflow to the manhole was from the Stebbins St. line, which had an exceedingly high count of >48,000 *E. coli*/100 mL. Up Main St. at the intersection with Depot St., the only inflow was from the Depot St. line, which had almost no *E. coli* (20 MPN/100 mL). Based on these data, it appears that sanitary wastewater enters the stormsewer on Main St. between School St. and Depot St. and also somewhere in the system above the Stebbins St. and School St. intersection.

Recommendation:

We recommend inspecting the stormsewer line on Main St. between School Street and Depot Street using a closed circuit television camera. We also recommend inspecting the stormsewer line starting at the intersection of School St. and Stebbins St. and working as far up the system as is feasible. The lines will need to be cleaned prior to inspection. page 5. . October 15, 2009

EN-280	Manhole in grass up-pipe from outfall EN-230	June: Fluoride		
	(which was buried) near bend in Dickinson Ave.			
September inve	estigation:			
Located outfall	EN-230 beneath grass clippings. No flow was observ	ed on 9/17 or 9/24, therefore no		
further investig	ration was made.			
Recommendation:				
Our testing here was inconclusive. It is likely that drinking water enters the stormline under some				
conditions from a leak in the water distribution system. It is possible that this is a function of groundwater				
levels. If the To	own is concerned about the possibility of a leak, we re-	commend the Town engage Vermont		
Rural Water to	perform leak detection.			
EN-360	Outfall below wastewater treatment plant	June: Optical brightener; ammonia		
		(low)		
September inve	estigation:			
A sample collected at the outfall on 9/3 had a no detectable <i>E. coli</i> (<20 MPN/100 mL). On 9/24, a trickle				
of flow was observed in the first catchbasin (EN-362) up the line from the outfall, continuing to the				
outfall. No flow was observed further up the line. No ammonia was detected at the outfall. We have yet to				
retrieve and rea	ad the optical brightener pads.			
Recommendati	on:			
We need to che	eck the optical brightener pads before making a recom	mendation.		

Overall, we strongly encourage the Town to engage Vermont Rural Water to inspect the indicated stormlines using a closed circuit television camera. I am aware that Vermont Rural Water charges a camera maintenance fee, but that their services are otherwise free of charge. There is a possibility this project could reimburse the Town for a portion of the camera maintenance fee. I will contact you soon to answer any questions you have about these date and discuss next steps.

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com c:Documents and Settings/Dave/Dedktop/Atherton_101409.docx

		Date	Ammonia	Sp. conductance	Deteraents	Fluoride			Date	E. coli	Total	Discharge
Structure ID	Structure type	assessed	(mg/L)	(ms/cm)	(mg/L)	(mg/L)	Optical brightener	Odor	sampled	(MPN/100 mL)	(mg/L)	(s/J)
EN-010	Outfall pipe	6/22/09	0.0	663	0.0	0.0	Negative					
EN-020	Outfall pipe	6/22/09	0.0	710	0.1	0.0	Lost pad, not reset					
EN-030	Outfall pipe	6/22/09	0.0	698	0.0	0.2	Lost pad, not reset					
EN-040	Outfall pipe	6/22/09	1.0	445	0.0	0.6	Negative		60/2/06	60	0.11	0.046
EN-050	Outfall pipe	6/22/09	0.0	553	0.0	0.0	Negative					
EN-060	Stream crossing	6/22/09	0.0	258	0.0	0.0	Lost pad, twice					
EN-070	Outfall pipe	6/22/09	0.25	732	0.1	0.0	Negative					
EN-080	Outfall pipe	6/22/09	Dry	Dry	Dry	Dry	Negative					
EN-090	Outfall pipe	6/22/09	0.0	823	0.2	0.0	Lost pad					
EN-100	Outfall pipe	6/22/09	0.0	393	1.7	0.2	Positive (definite)		9/3/09	100	0.029	0.084
EN-110	Outfall pipe	6/22/09	0.0	1,058	0.2	0.0	Negative					
EN-120	Outfall pipe	6/22/09	0.0	828	0.1	0.2	Negative					
EN-130	Outfall pipe	6/22/09	Dry	Dry	Dry	Dry	Negative					
EN-140	Outfall pipe	6/22/09	0.0	1,257	0.2	0.0	Positive (streak)					
EN-150	Stream crossing	6/22/09	0.0	272	0.0	0.0	Positive (spot)					
EN-160	Outfall pipe	6/22/09	0.0	1,663	0.4	0.0	Positive (definite)		9/3/09	160	0.012	0.000
EN-170	Outfall pipe	6/23/09	0	1,216	0.1	0.2	Negative	sewer odor				
EN-180	Outfall pipe	6/23/09			Dry							
EN-190	Outfall pipe	6/23/09			Dry							
EN-200	Outfall pipe	6/23/09			Dry							
EN-210	Outfall pipe	6/23/09	0.5	942	0.1	0.0	Lost pad		9/3/09	>4,000	0.023	0.360
EN-220	Outfall pipe	6/23/09	-		Dry							
EN-230	Outfall pipe	6/23/09		Outfall buriedSa	mpled line at r	nanhole EN	-280					
EN-240	Outfall pipe	6/23/09		Outfall not foundS	ampled line at e	catchbasin I	EN-270					
EN-250	Outfall pipe	6/23/09	0.4	680	0.0	0.1	Lost					
EN-260	Outfall pipe	6/23/09		Stagnar	it waternot sa	umpled						
EN-270	Catchbasin	6/23/09	0.0	1,148	0.0	0.0	Negative					
EN-280	Manhole	6/23/09	0.0	621	0.0	0.5	Negative					
EN-290	Manhole	6/23/09		Manhole too deep t	o sample		Negative					
EN-350	Outfall pipe	6/23/09	_	Not assessedCould	not locate prev	iously mapp	ed outfall					
EN-360	Outfall pipe	6/23/09	0.25	1,070	0.0	0.2	Positive (weak)		9/3/09	<20	0.012	0.055
Structure	s in the central	municipal	system dis	scharging at outf	all EN-210 (200 ft no	th of the Hwy 105	3 bridge)				
EN-300	Manhole	6/23/09	0.7	Insufficient sample	1.5	0.0	Negative					
EN-310	Manhole	6/23/09		Insufficient flow to	sample		Negative					
EN-320	Manhole	6/23/09	0.25	571	0.1	0.0	Positive (bright spot)					
EN-330	Manhole	6/23/09	0.25	Insufficient sample	0.0	0.1	Negative					
EN-340	Manhole	6/23/09	0.25	730	0.75	0.0	Positive (spots)					

Table 4: Initial discharge assessment in Enosburg Falls, followed by sampling for *E. coli* and total phosphorus where necessary

Missisquoi	IDDE.	
Client/Sponsor:		
itive for a	detergents	
line		
(ppm)	OB Set	Flooride
0.0	Yes	0.0
NS	Yes	NS
NS	Yes	
et.	on individ	val
, EN 101 (EN102 on	912-109
24109		
PM		
	Client/Sponsor: Client/Sponsor: itive for a line setergents (ppm) 0.0 NS NS NS NS thetated itive o.0 NS NS thetated thetated itive o.0 NS NS thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 thetated o.0 NS thetated o.0 thetated o.0 NS thetated o.0 NS thetated o.0 NS thetated o.0 thetated o.0 NS thetated o.0 thetated o.0 thetated o.0 thetated o.0 thetated o.0 thetated o.0 thetated o.0 thetated o.0 thetated o.0 NS NS thetated o.0 thetated o.	Client/Sponsor: Client/Sponsor: i Hive for detergents line Detergents OB Set (ppm) OB Set (ppm

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APPENDIX B: CAMERA INSPECTION REPORTS FOR

ENOSBURG FALLS

STONE ENVIRONMENTAL INC



SEWER LINE INSPECTION REPORT ENOSBURG STORM WATER SYSTEM 6/22/10

On June 22nd, of 2010, Wayne Graham (VRWA) performed a full day of sewer camera inspections. These inspections were conducted at Dave Braun's (Stone Environmental) direction in order to find illicit discharges into storm water lines, they were not performed as comprehensive line inspections. Defects noted in red. The video tape of the actual sewer camera inspections is available at the WW treatment facility.

Inspection: Main St/Depot to South, 10 Inch PVC

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
DEBRIS/SAND	43	TOO MUCH DEBRIS/SAND
		END INSPECTION

Inspection: Main St./Bismark to North, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
DRIP AT JOINT	7	12 O'CLOCK
CONNECTION	28	10 O'CLOCK, CAPPED
OBSTRUCTION	? SEE TAPE	75% LINE BLOCKED WITH
		MINERALIZATION
		END INSPECTION

Inspection: Main St./Bismark to South, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
DEBRIS,SAND	14	TOO MUCH DEBRIS/SAND
		END INSPECTION

Inspection: Main/School to North, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
SAND	2	TOO MUCH SAND END INSPECTION

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	? SEE TAPE	12 O'CLOCK, DRIPPING
		(GOES TO LEFT HAND
		CATCH BASIN)
CONNECTION	? SEE TAPE	1 O'CLOCK, DRY
		(GOES TO RIGHT HAND
		CATCH BASIN)
CONNECTION	74	12 O'CLOCK, CAPPED
CONNECTION	80	12 O'CLOCK, CATCH BASIN
CONNECTION	161	12 O'CLOCK, CAPPED
CONNECTION	166	12 O'CLOCK, FLOWING
CONNECTION	184	12 O'CLOCK, DRY
MANHOLE	205	END INSPECTION

Inspection: Main St. to School St. Clay Pipe

Inspection: School/Stebbins to Main, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	68	12 O'CLOCK, CAPPED
CONNECTION	150	12 O'CLOCK, CAPPED
CONNECTION	152	12 O'CLOCK, CAPPED
MANHOLE	200	END INSPECTION

Inspection: School to Stebbins, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	34	12 O'CLOCK, DRY
CONNECTION	59	12 O'CLOCK, DRY
CONNECTION	89	12 O'CLOCK, CAPPED?
CONNECTION	106	12 O'CLOCK, DRY
CONNECTION	107	12 O'CLOCK, DRY
CONNECTION	108	12 O'CLOCK, CAPPED
CONNECTION	135	12 O'CLOCK, CAPPED
CONNECTION	158	12 O'CLOCK, DRY
CONNECTION	165	10 O'CLOCK, CAPPED
CONNECTION	212	12 O'CLOCK, CAPPED
CONNECTION	218	12 O'CLOCK, CAPPED
DEBRIS	250	END INSPECTION

Inspection: School/Stebbins to East, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
SAND	6	TOO MUCH SAND
		END INSPECTION

Inspection: Stebbins to School, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	15	3 O'CLOCK, DRY
SAND	43	TOO MUCH SAND
		END INSPECTION

Inspection: Depot/Pleasant to North, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	12	3 O'CLOCK, PLUGGED
SAND	17	TOO MUCH SAND

Inspection: Depot/Pleasant to South, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
BRICK IN PIPE	68	END INSPECTION

Wayne Graham

Wastewater Specialist

Vermont Rural Water Association (VRWA)

802-343-1355 cell

wgraham@vtruralwater.org



SEWER LINE INSPECTION REPORT ENOSBURG STORM WATER SYSTEM 6/23/10

On June 23nd, of 2010, Wayne Graham (VRWA) performed a full day of sewer camera inspections. These inspections were conducted at Dave Braun's (Stone Environmental) direction in order to find illicit discharges into storm water lines, they were not performed as comprehensive line inspections. Defects noted in red. The video tape of the actual sewer camera inspections is available at the WW treatment facility.

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	4	9 O'CLOCK, CAPPED
CONNECTION	60	3 O'CLOCK, CAPPED
CONNECTION	81	9 O'CLOCK, CAPPED
CONNECTION	96	1 O'CLOCK, CAPPED
CONNECTION	109	12 O'CLOCK, CAPPED
CONNECTION	122	12 O'CLOCK, CAPPED
CONNECTION	127	2 O'CLOCK, CAPPED?
CONNECTION	175	2 O'CLOCK, CAPPED?
REPAIRED PIPE	181	12 O'CLOCK
CONNECTION	236	3 O'CLOCK, CAPPED
CONNECTION	265	12 O'CLOCK, CAPPED
MANHOLE	272	END INSPECTION

Inspection: Pleasant House # 418 to West, Clay Pipe

Inspection: Pleasant/Depot to East, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	12	3 O'CLOCK, DRY, FULL OF
		SAND AND ROCKS
SAND	17	TOO MUCH SAND
		END INSPECTION

Inspection: Pleasant/Depot to West, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	13	12 O'CLOCK, CAPPED
BRICK IN LINE	79	END INSPECTION

Inspection: Pleasant/East St. to South, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
DROP IN LINE	3	CANNOT MAKE IT
		END INSPECTION

Inspection: Missisquoi/Pleasant to North, Clay Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	58	9 O'CLOCK, CAPPED
CONNECTION	75	2 O'CLOCK, CAPPED?
CONNECTION	89	12 O'CLOCK, CAPPED?
CRACKS	89	LARGE CRACKS
CONNECTION	102	12 O'CLOCK, CAPPED?
CONNECTION	103	9 O'CLOCK, CAPPED
CONNECTION	104	1 O'CLOCK, CAPPED
CONNECTION	107	12 O'CLOCK, CAPPED
CONNECTION	108	11 O'CLOCK, CAPPED
CONNECTION	148	9 O'CLOCK, CATCH BASIN
CONNECTION	157	12 O'CLOCK, CAPPED
CONNECTION	161	12 O'CLOCK, CAPPED
CONNECTION	198	CONNECTION FULL OF
		ROCKS
CONNECTION	219	3 O'CLOCK, CAPPED
CONNECTION	319	9 O'CLOCK, CAPPED?
BRICK IN LINE	336	END INSPECTION

Inspection: Bismark to outfall, PVC Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	52	12 O'CLOCK, DRIPPING
CONNECTION	86	12 O'CLOCK, DRIPPING
OUTFALL	265	END OF INSPECTION

Inspection: Bismark to Main, PVC Pipe

ITEM OF NOTE	DISTANCE IN FEET	DESCRIPTION
CONNECTION	4	3 O'CLOCK, FLOWING
CONNECTION	100	10 O'CLOCK, FLOWING
CATCH BASIN	297	END INSPECTION

Wayne Graham

Wastewater Specialist

Vermont Rural Water Association (VRWA)

802-343-1355 cell

wgraham@vtruralwater.org

APPENDIX C: LETTER TO TOWN OF HIGHGATE CENTER

STONE ENVIRONMENTAL INC

November 3, 2009

David Jescavage Town Administrator PO Box 189 Highgate Center, VT 05459

SEI No. 082119-W RE: Highgate Center IDDE results



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

Dear David:

This letter is to summarize the results of the illicit discharge assessment performed in Highgate Center this past summer. The purpose of the assessment was to identify contaminated dry-weather flows—such as sanitary wastewater, industrial discharges, and other contaminated "non-stormwater" flows—entering the town's stormwater drainage system. The work in Highgate Center was part of a larger illicit discharge detection and elimination project funded by the Vermont Agency of Natural Resources, Center for Clean and Clear.

On July 22, 2009, water quality tests were conducted at four catchbasins in Highgate Center during dryweather conditions (see Figure 1). We tested for ammonia, detergents (specifically, methylene blue active substances), specific conductance (electrical conductivity), and optical brighteners, which are fluorescent dyes contained in most laundry detergents. Results from the assessment are summarized in Table 1 below.

Table 1: Initial discharge assessment in Highgate Center, July 22, 2009								
		Ammonia	Sp. conductance	Detergents (MBAS)	Optical			
Structure ID	Structure type	(mg/L)	(µs/cm)	(mg/L)	brighteners			
HC-010	catchbasin	0.0	329	0.0	Negative			
HC-020	catchbasin	0.0	261	0.25 ^A	Negative			
HC-030	catchbasin	0.0	252	0.0	Negative			
HC-040	catchbasin	0.0	251	0.0	Lost twice			

A = The HC-020 sample was extremely turbid. The detergents test on the HC-020 sample produced a green color instead of the expected blue color, likely due to fine clay particles in suspension. Therefore, the accuracy of this result is questionable.

No ammonia, detergents, or optical brighteners were detected at any of the catchbasins tested with the exception of a low concentration of detergents at catchbasin HC-020. We suspect the apparent detergents detection at HC-020 resulted from high turbidity (colloidal clays) rather than presence of

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synthetic detergent. Because the detergents test result was low and may not have been valid and there were no other indications of contamination at this catchbasin, no further investigation was necessary.

In summary, we detected no contaminated dry-weather flows in stormwater structures in Highgate Center. Thank you for your assistance.

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

C:\Documents and Settings\Dave\Desktop\Jescavage_110309.docx



Figure 1: Illicit Discharge, Detection, & Elimination Assessment Points Highgate Center, Vermont - Summer 2009

Sources: VCGI: NAIP 2008 Imagery; DEC: catch basins, manholes, outfalls, and stormlines.



APPENDIX D: LETTER TO TOWN OF MONTGOMERY

CENTER

STONE ENVIRONMENTAL INC

November 3, 2009

Mark Brouillette Montgomery Water Department P.O. Box 442 Montgomery Center, VT 05471

SEI No. 082119-W RE: Montgomery Center IDDE results



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

Dear Mark:

This letter is to summarize the results of the illicit discharge assessment performed in Montgomery Center this past summer. The purpose of the assessment was to identify contaminated dry-weather flows—such as sanitary wastewater, industrial discharges, and other contaminated "non-stormwater" flows—entering the town's stormwater drainage system. The work in Montgomery was part of a larger illicit discharge detection and elimination project funded by the Vermont Agency of Natural Resources, Center for Clean and Clear.

On July 6, 2009, we assessed six stormwater structures in Montgomery Center (see Figure 1) during dryweather conditions. Outfalls labeled MG-020 and MG-060 were not flowing. Water quality tests were conducted at three flowing outfalls and at a catchbasin on Main Street (labeled MG-030). We tested for ammonia, detergents (specifically, methylene blue active substances), specific conductance (electrical conductivity), and optical brighteners, which are fluorescent dyes contained in most laundry detergents. Results from the initial assessment are summarized in Table 1 below. No ammonia, detergents, or optical brighteners were detected at the outfalls. We did detect both ammonia and detergents at catchbasin MG-030, although the detergents test result is of questionable accuracy.

Table 1: Initial discharge assessment in Montgomery Center, July 6, 2009							
Structure ID	Structure type	Ammonia (mg/L)	Sp. conductance (µs/cm)	Detergents (MBAS) (mg/L)	Optical brighteners		
MG-010	Outfall	0.0	344	0.0	Negative		
MG-020	Outfall	Dry—No samples collected					
MG-030	Catchbasin	0.5	no sample	2.0 ^A	Negative		
MG-040	Outfall	0.0	262	0.0	Negative		
MG-050	Outfall	0.0	364	0.0	Negative		
MG-060	Outfall	Dry—No samples collected					
A = The detergents test on the MG-030 sample produced a green color instead of the expected blue color, most likely due to some type of chemical interference. Therefore, the accuracy of this result is questionable.							
page 2. . November 3, 2009

Catchbasin MG-030 discharges at outfall MG-010. Due to the detection of ammonia and detergents at catchbasin MG-030 on July 6, we collected follow-up samples for *E. coli* and total phosphorus at outfall MG-010. Very low concentrations of *E. coli* (30 MPN/100 mL) and total phosphorus (0.016 mg/L) were found in a grab sample collected on August 20, 2009. Further, no dry-weather flow was observed at catchbasin MG-030 on August 20 or on two later dates, September 3 and 17.

On September 3, we observed a flow of water entering catchbasin MG-012 up the stormline from outfall MG-010. The next catchbasin up the stormline from MG-012 was dry. The flow to catchbasin MG-012 appeared to enter from beneath the influent pipe. This flow was tested for chlorine to ascertain whether the flow was due to a leak in the drinking water distribution system. No chlorine was detected. This flow is therefore assumed to be uncontaminated groundwater.

In summary, we detected no contaminated dry-weather flows in stormwater structures in Montgomery Center, except for a one-time occurrence of ammonia and detergents in catchbasin MG-030 on Main Street. We suspect the contamination observed in catchbasin MG-030 was related to washwater runoff or direct dumping to the basin. Vehicle washing, pressure washing, and emptying of mop buckets are common sources of methylene blue active detergents in stormwater drainage systems. We recommend that the Water Department inspect this catchbasin periodically to check for detergent suds, odors, or other signs of contamination, and, if found, to advise neighboring residents and business owners not to allow washwater and other contaminated flows to enter the town's stormwater drainage system.

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

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Figure 1: Illicit Discharge, Detection, & Elimination Assessment Points Montgomery Center, Vermont - Summer 2009

Sources: VCGI: NAIP 2008 Imagery; DEC: catch basins, manholes, outfalls, and stormlines.



APPENDIX E: LETTERS TO TOWN OF NORTH TROY

STONE ENVIRONMENTAL INC

November 11, 2009

Marcel Mayhew North Troy Wastewater Treatment Plant 122 Elkins Dr. North Troy, VT 05859

SEI No. 082119-W RE: North Troy IDDE results



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

Dear Mr. Mayhew:

This letter is to summarize the results of the illicit discharge assessment performed in North Troy this past summer. The purpose of the assessment was to identify contaminated dry-weather flows—such as sanitary wastewater, industrial discharges, and other contaminated "non-stormwater" flows—entering the town's stormwater drainage system. The work in North Troy was part of a larger illicit discharge detection and elimination project funded by the Vermont Agency of Natural Resources, Center for Clean and Clear.

On June 24, 2009, we assessed 10 stormwater structures in North Troy (see Figure 1) during dryweather conditions. Five stormwater outfalls were dry when visited. Water quality tests were conducted at the five flowing structures, which included three outfalls (labeled NT-010, NT-060, and NT-080), a stream culvert (NT-050), and a catchbasin (NT-100). We sampled flow at catchbasin NT-100 because we could not locate the outfall for this stormsewer, which we expect is buried; catchbasin NT-100 was the final structure we could access on this stormline. At the flowing structures, we tested for ammonia, detergents (specifically, methylene blue active substances), specific conductance (electrical conductivity), and optical brighteners, which are fluorescent dyes contained in most laundry detergents. Results from the initial assessment are summarized in Table 1 below.

Table 1: Initial discharge assessment in North Troy, June 24, 2009							
Structure ID	Structure type	AmmoniaSp. conductanceDetergents (MBAS)Optical(mg/L)(µs/cm)(mg/L)brightener					
NT-010	Outfall	tfall 0.0 402 0.0 Po					
NT-020	Outfall	Dry—No samples collected					
NT-030	Outfall	Dry—No samples collected					
NT-040	Outfall	Dry—No samples collected					
NT-050	Stream	0.0 344 0.0		Negative			
NT-060 Outfall 0.0 636 0.1		0.1	Positive (weak)				

page 2 . . November 11, 2009

Table 1: Initial discharge assessment in North Troy, June 24, 2009						
NT-070	F-070 Outfall Dry—No samples collected					
NT-080	Outfall	0.0 240 0.0 Negativ				
NT-090	Outfall	Dry—No samples collected				
NT-100 Catchbasin 0.1 690 0.0 Negativ						

We did not observe obvious signs of contamination, such as suds, staining, and odors, at any of the structures we assessed on June 24. Eight of the ten structures assessed were either dry or had no detectable contamination. However, the initial data suggested sanitary wastewater or washwater discharges within the stormwater drainage systems discharging at outfalls NT-010 (Nason Terrace) and NT-060 (Railroad St. at the School St. intersection). Optical brighteners were detected at both outfalls. Because ammonia and detergent concentrations were below detection, we suspected that the apparent wastewater discharges were substantially diluted by uncontaminated water. Due to the detection of optical brighteners at outfalls NT-010 and NT-060, we attempted to trace the source of the contamination up the stormlines and also collected samples for *E. coli* and total phosphorus analysis (see attached field notes). The *E. coli* and total phosphorus results are given in Table 2 below.

Table 2: Follow-up sampling of outfalls with suspected contamination, August 20, 2009				
Structure ID	<i>E. coli</i> (MPN/100 mL)	Total phosphorus (mg/L)	Discharge (L/s)	
NT-010	720	0.087	0.163	
NT-060	140	0.045	0.318	

The sample collected on 8/20 from outfall NT-010 had an elevated *E. coli* level of 720 MPN/100 mL, however this level is much lower than typical levels for raw wastewater. On the three dates we investigated this system (6/24, 8/20, and 9/18), most of the flow at NT-010 was contributed by a stream that runs along the backside of properties on Pleasant St. This stream flows through a culvert into a catchbasin on Nason Terrace, into which a stormsewer on North Pleasant St. also drains. When observed on 8/20 and 9/18, the stormsewer pipe was trickling, while the next catchbasin up the stormline was dry. The combined flow then passes under Nason Terrace to the outfall. To determine whether the contamination present at the outfall originated in the stream or in the North Pleasant St. stormsewer, we intended to sample both flows at the Nason Terrace catchbasin, but, unfortunately, the catchbasin grate could not be lifted. We suspect that the dry-weather flow from the stormsewer is the source of the contamination rather than the stream, because there is clearly infiltration into this pipe, the pipe appears to cross a sanitary sewer line, and there is iron staining at the discharge point in the Nason St.

page 3 . . November 11, 2009

catchbasin. We therefore recommend inspecting this pipe, and possibly also the sanitary sewer line in this area, using a closed circuit television camera. Wayne Graham of the Vermont Rural Water Association may be of assistance with the pipe inspection.

On 8/20, we set optical brightener monitoring pads in every accessible structure in the stormsewer discharging at NT-060. Optical brighteners were detected up the stormline on School St. and Main St. up to and including the catchbasin labeled NT-060G, which is near #129 Main St. The strongest fluorescence was in the NT-060G pad. Up the stormline from this point no optical brightener was detected. We revisited catchbasin NT-060G on 9/18 and noted a septic odor, but could not collect a water sample because this is an irregular structure with a narrow diameter drop inlet pipe. We suspect a wastewater or washwater connection exits from one or more of the houses near catchbasin NT-060G. We recommend inspecting—and dye testing, if appropriate—the plumbing connections at #129 Main St. —and neighboring houses, if necessary—to identify the specific source(s) of contamination.

In summary, we suspect illicit discharges are occurring in the storm drainage systems discharging at NT-010 (Nason Terrace) and NT-060 (Railroad St.). The likely source of the contamination documented at outfall NT-010 is inflow of sanitary wastewater to the stormline between the catchbasin on Nason Terrace and the next catchbasin up the line on North Pleasant Street. We recommend the Town of North Troy inspect this stormline and, if necessary, the sanitary sewer using a closed circuit television camera. The likely source of contamination in the stormsewer discharging at NT-060 is a sanitary wastewater or washwater connection to the stormline from a house on Main St. We recommend inspection and correction of the plumbing connections, including laundry facilities, in #129 Main St. If this doesn't lead to resolution of the problem, then we recommend inspection of neighboring houses.

We encourage the Town to engage the Vermont Rural Water Association (VRWA) to further investigate the sources of contamination entering the stormsewer near the location indicated. VRWA (Wayne Graham) can inspect the systems using a closed circuit television camera or smoke testing. Stone Environmental has made an arrangement with the VRWA to cover their costs for camera maintenance; therefore VRWA's services to the town related to this project would be free of charge.

I will contact you soon to discuss these findings and your preferred means of addressing them. If you have any questions or concerns in the meantime, please contact me.

page 4 . . November 11, 2009

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

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Figure 1: Illicit Discharge, Detection, & Elimination Assessment Points North Troy, Vermont - Summer 2009

Sources: VCGI: NAIP 2008 Imagery; DEC: catch basins, manholes, outfalls, and stormlines.







Stone Environmental inc

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com Project Name/Description:

Missisquoi IDDE

SEI Project #: 082119-W

Client/Sponsor:

NORTHTROY NTOID E.CONI + TP samples taken set pad

NTOID A set pad NTOID B set pad

majority of flow coming from pipe from 5. W. Small amount (trickie) from n.e. pipe s.e. pipedry

Signed: Christine

Date: ______8120109

5 squares = 1 inch

Page: 1____ of ____





5 squares = 1 inch

Page: 1_ of ___

STONE ENVIRONMENTAL INC	Project Name/Description:		
535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602USAWeb Site / www.stone-env.com			
SEI Project #:	Client/Sponsor:		
North Troy OB Pick Up <u>Bod ID</u> <u>Picked UP</u> NTOGOD Yes NTOGOA Yes NTOGOC Yes NTOGOE Yes	Lesults (9/21/09) Positive Positive Negative Positive Negative Negative Negative Negative Negative Positive Positive		
MINTO 10B TRANSFORMANTO A TO Z CONTRACTOR ACCON: SOMANDIA FOR	A stream on Black St.		
could not open CB NTOIDA	N 2 MECHAI OLI DICUCI 21.		
	Date:		

Page: _____ of _____

Project Name/Description: < STONE ENVIRONMENTAL INC Phone / 802.229.4541 535 Stone Cutters Way MESSESquar IDDE Montpelier, Vermont Fax / 802.229.5417 05602 USA Web Site / www.stone-env.com Client/Sponsor: Clean & Clear SEI Project #: 082119-W Follow - up Investigation 9/17/09 North Troy NT-10 - @ MH U.S. of descharge - placed pad in culvert ul stream flow - placed pad in tricklary stormline from N. Pleasant Street. Streamflow ~ 0.25 mg/L A. trop trickling pipe from N. pleasant = 0.0 mg Across from the NT-60 Attempted to sample NT-60-61 catchbassbut pipe opening to narrow to retrieve sample I to small a septre ofor have Likely impossible to view ala camer Dave Bran Date: _ 9/18/09 Signed: Page: 2 of 2

January 8, 2010

Marcel Mayhew North Troy Wastewater Treatment Plant 122 Elkins Dr. North Troy, VT 05859

SEI No. 082119-W RE: North Troy IDDE follow-up investigation

Dear Mr. Mayhew:

I am writing to summarize the findings of the discharge investigation you and I performed with Wayne Graham (Vermont Rural Water Association) in North Troy on December 16, 2009. As we've discussed and as my November 11, 2009 letter to you described, the data from the illicit discharge assessment we conducted over the summer months pointed to the presence of washwater or sanitary wastewater contamination in dry-weather flows at two outfall pipes: the outfall below Nason Terrace (point NT-010) and the outfall off Railroad Street near the School Street intersection (point NT-060). Optical brighteners, which are dyes used in laundry detergents, were detected at both outfalls. On December 16th, we attempted to find sources of washwater or sanitary wastewater entering the stormsewers discharging in these two locations.

In investigating the NT-060 stormsewer, we focused on an area on Main Street across from the public school. Follow-up testing on August 20 indicated that washwater or wastewater might be coming from an improper connection to the stormsewer in this area. There are several houses and a church in this area. On December 16, we attempted to locate improper connections using a smoke blower and theater smoke. Wayne Graham installed the blower over catchbasin grates and we observed building vents for signs of smoke, which would indicate connection between the stormsewer and the building sewer. No smoke was observed issuing from any building vent. Smoke was observed seeping through the cracked foundation of an abandoned house, which suggests a connected floordrain; however, this house has not been occupied for many years, so it is not the source of the contamination. The church building does not have laundry facilities, ruling out this building as the source of contamination. Because smoke testing was not definitive, we entered houses to inspect plumbing connections, where residents were at home. Here is what we found:

- # 129 Main Street: No smoke in the basement and no improper sanitary connection.
- Green house next to #129 Main Street: There was no one home. Because, as you indicated, this is a rarely used second home, this is unlikely to be the source of the contamination.



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com page 2 . . January 8, 2010

• #49 Robinson Road (corner of Main Street and Robinson Road): Apparent connection from clothes washing machine to stormsewer. The plumbing for this washing machine will need to be corrected. We also found an open sanitary line in the basement which should be capped to prevent venting of sewer gases into the building.

We cannot be sure, but we expect that elimination of the improper laundry connection at #49 Robinson Road will eliminate the contamination we observed at the outfall.

On Nason Terrace, we smoke tested the stormsewer via the catchbasin immediately up from the outfall pipe. Based on your description of the stormsewer, there are two or three houses that could possibly have an inappropriate connection to this system. We observed smoke issuing from the connected catchbasins and culvert, but none from building vents. We attempted to inspect interior plumbing, however no one was home at the houses in this area.

Our recommendations are as follows:

- Ensure that the homeowner (Betty Allen) at #49 Robinson Road corrects the improper laundry connection to the stormsewer. We ask that this problem be corrected by May 2010 (allowing ample time based on the homeowner's age and fixed income). The uncapped sanitary wastewater line should also be remedied to prevent venting of sewer gases into the building.
- Perform inspections of building sewer connections at #137 Nason Terrace, #364 Pleasant Street, and any other potentially connected buildings and require correction of any improper connections.
- 3. Consider conducting a more comprehensive sanitary survey in North Troy to identify other possible improper connections to the stormsewer. As you stated, there are likely to be many connected floordrains in North Troy. Over time laundry and wastewater connections may have been made to these floordrains. Our monitoring represented a snapshot in time and it is quite possible that due to timing or flow dilution, there are additional improper connections that we failed to detect.

I will plan on contacting you periodically about progress with the repair at #49 Robinson Road. If you have any questions or concerns, please feel free to contact me at any time.

page 3 . . January 8, 2010

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

cc : Jim Pease, Vermont Department of Environmental Conservation Wayne Graham, Vermont Rural Water Association

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APPENDIX F: LETTERS TO TOWN OF RICHFORD

STONE ENVIRONMENTAL INC

October 7, 2009

John Nutting Town of Richford 94 Main St. Richford, VT 05476

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STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

SEI No. 082119-W RE: Further investigation of suspected sanitary wastewater leaks

Dear John:

With your assistance and the support of the Vermont Department of Environmental Conservation, Stone Environmental, Inc. has completed an assessment of the Town of Richford's stormwater infrastructure for the presence of contaminated, dry weather flows. We identified pipes discharging to the Missisquoi River and its tributaries in Richford and sampled those that were flowing during dry weather periods. By the end of the year, we will provide the Town with a report detailing the assessment. The assessment pointed to potential problems in several locations, which we've been discussing with you recently. I am writing now to recommend that the Town of Richford further investigate two suspected problems, using closed circuit television and/or other techniques.

As you know, in two locations we suspect that sanitary wastewater is discharging to the Missisquoi River. One of these locations is a 12-inch diameter corrugated steel pipe outfall (structure "RF-50") east of Willow Street by the Missisquoi River. Our observations and test results suggest that sanitary wastewater is flowing from this stormwater pipe. See the attached summary of water quality data at this location. We do not know if there is a leak in the sanitary sewer from which wastewater infiltrates the stormline or a direct connection between the wastewater and stormwater collection systems.

The second location is the riverbank below the parking lot between the Sunoco gas station and the bank building. In this area we have observed multiple groundwater seeps and pipes flowing during dry weather. Only one pipe ("RF-10Y"), a 12-inch diameter concrete pipe, is connected to any surface stormwater drain. This appears to be a legitimate stormwater outfall without contaminated dry weather flow. We also tested one groundwater seep ("RF-10") and two outfall pipes (RF-10X and RF-10Z) protruding from the bank. Outfalls RF-10X and RF-10Z and the groundwater seeps show obvious orange (iron) staining and elevated ammonia and detergent levels. See the attached data. Our theory is that sanitary wastewater is leaking from a sewer line or connection and flowing through the soil to the bank, where some of the wastewater is incepted and then discharged by relict pipes. It is possible there is page 2. . October 7, 2009

a leak in the 6-inch diameter force main shown on a sewer map described to me by Joe Peryea of Simons Operating Service.

We have done what we can to isolate these suspected problems using the limited tools available to us. The ammonia and detergents we detected at outfall RF-50 were not present at the next structure up the pipe, a manhole in a backyard off Troy Avenue, so we expect that contamination enters the stormline in the vicinity of the sewer line crossing. Because there are no connected stormwater inlets to pipes RF-10X and RF-10Z or to the seeps, there is nothing more we can do to isolate the problems with water testing. In a recent conversation with Mark Simon of Simon Operating Services, Mr. Simon confirmed that his company owns a camera used to inspect wastewater piping. Mr. Simon also discussed a technique to evaluate flow loss in the force main to diagnose a possible leak. Regardless of the techniques employed, we encourage the Town of Richford to find and eliminate the source of the contaminated flows in these areas. Eliminating these wastewater flows will be a significant benefit to water quality.

Sincerely yours,

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

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Structure ID: RF-50

Description: 12-inch diameter corrugated steel pipe. Orange staining at outfall.

Visit Date	Observation
8/5/2009	Ammonia = 1.0 mg/L; Detergents (MBAS) = 0.1 mg/L; Specific conductance = 938 μs/cm; Optical
	Brightener = Lost
	Also tested first up-pipe access structure, a manhole in a yard off Troy Ave. Ammonia = 0.0 mg/L;
	Detergents (MBAS) = 0.0 mg/L; Specific conductance = 929 μs/cm
8/20/2009	<i>E. coli</i> = > 2,400 MPN/100 mL; Total phosphorus = 0.055 mg/L; Flow = 3.4 gpm
9/17/2009	Checked outfall with Joe Peryea of Simon Operating Services, Inc. Noted orange staining at outlet
	and accumulation of detergent foam.
la	
Structure ID	: RF-10 (Seep)
Description:	Groundwater seep in bank by apple tree sapling

Visit Date	Observation
7/7/2009	Ammonia = 6.0 mg/L; Detergents (MBAS) = 1.0 mg/L; Specific conductance = 658 μs/cm; Optical
	Brightener = positive (strong); Sewer smell
8/5/2009	No flow observed at this particular seep
8/20/2009	No flow observed at this particular seep
9/17/2009	No flow observed at this particular seep
Structuro IF	0. PE 10Y

Structure ID: RF-10X				
12-inch diameter ductile iron pipe, thickly coated with orange iron deposit. No apparent connection to any surface drain.				
Observation				
Ammonia = 5.0 mg/L; Detergents (MBAS) = 0.6 mg/L; Specific conductance = 1014 μs/cm; Optical Brightener = Negative; Slight septic smell.				
<i>E. coli</i> = 1 MPN/100 mL; Total phosphorus = 0.056 mg/L; Flow = 1.7 gpm				
Checked outfall with Joe Peryea of Simon Operating Services, Inc. Noted orange staining at outlet and minor dry weather flow. Also noted a 3 to 4 inch diameter iron pipe nearby, with dry weather discharge and iron staining. This pipe was not noted in prior visit.				

Structure ID: RF-10Z

Description: 12-inch diameter corrugated metal pipe. No apparent connection to any surface drain.

Visit Date	Observation
8/5/2009	Ammonia = 3.0 mg/L; Detergents (MBAS) = 0.2 mg/L; Specific conductance = 1279 μs/cm; Optical
	Brightener = Lost; Slight septic smell.
8/20/2009	E. coli = 770 MPN/100 mL; Total phosphorus = 0.12 mg/L; Flow = 0.9 gpm
9/17/2009	Checked outfall with Joe Peryea of Simon Operating Services, Inc. Noted orange staining at outlet and minor dry weather flow.

January 14, 2010

Mary Mankin Water/Wastewater Superintendent Town of Richford 94 Main St. Richford, VT 05476



STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

SEI No. 082119-W RE: Further investigation of suspected sanitary wastewater leaks

Dear Mary:

I am writing to summarize the findings of the discharge investigation Wayne Graham (Vermont Rural Water Association), Rich Mackay, and I performed in Richford on December 16, 2009. As we've discussed and as my October 7, 2009 letter to John Nutting (forwarded to you on December 7) described, the data from the illicit discharge assessment we conducted over the summer months pointed to sanitary wastewater contamination in dry-weather flows in two locations. One of these locations is a 12-inch diameter corrugated metal outfall pipe (referred to as "RF-050") east of Willow Street by the Missisquoi River. Within 10 feet of this pipe is a 24-inch diameter pipe with a crushed end (structure RF-045) that was also suspect. The second location is a cluster of pipes at the riverbank below the parking lot between the Sunoco gas station and the TD Bank building (RF-010X, RF-010Z). There does not appear to be any surface drain connected to structures RF-045, RF-010X, and RF-010Z.

On December 16th, we attempted to locate sources of contamination producing these contaminated dry weather flows. South of the Main Street pump station, beyond the end of Willow Street, we found stormwater outfall RF-050 to be flowing. Structure RF-045 was also flowing. Both outfall locations are marked by orange-stained deposits. Because we suspected a cross connection between the sanitary sewer main and the RF-050 stormsewer (and possibly RF-045), we smoke tested the sanitary sewer through a sanitary manhole ("SMH#9-A" on town sewer map; see Figure 1). Almost immediately smoke issued from outfall RF-045 in great quantity (Figure 2). This indicates a more or less direct connection between the sanitary sewer and outfall RF-045. After approximately 10 minutes, smoke began issuing from pipe RF-050 (Figure 3), suggesting an indirect connection between the sanitary sewer and this pipe.

Further inspection of sanitary manhole SMH#9-A revealed an outlet pipe high on the structure's wall. This appears to be a sewer overflow. The inlet end of the pipe appears sealed with concrete; however, a Y-connection on the pipe does not appear to be plugged. We sealed this Y connection

page 2. . January 14, 2010

temporarily and restarted the smoke test to see if this stopped the flow of smoke from RF-045 or RF-050, but this did not appear to make any difference. We do not know if the overflow pipe in this manhole is an active sewer overflow, but its presence explains neither the contaminated dry weather flows nor the smoke observed at outfalls RF-045 and RF-050.



Figure 1. Smoke testing at sewer manhole SMH#9-A (near Willow Street)



Figure 2. Smoke from outfall RF-045

page 3. . January 14, 2010



Figure 3. Smoke from outfall RF-050

It was late in the day when we began investigating the source of contamination at the river bank between the Sunoco station and TD Bank. Outfalls RF-010X and RF-010Z were flowing. A third pipe, a 4-inch diameter iron pipe, was also flowing. These three pipes are marked by orange-stained deposits. The legitimate stormsewer outfall (RF-010Y), which is not stained with orange deposits, was not flowing. We previously found no contamination at outfall RF-010Y. Figure 4 shows flow from outfall RF-010X.

It is not possible to smoke test a flowing force main, so we attempted to test for connection between the force main and the cluster of contaminated pipes by adding dye to the pump station wet well. Dye was not observed at the bank within approximately 20 minutes of addition. Chief operator Rick Mackay returned the following day, added more dye, and did not observe dye on the bank over the course of the day. This suggests either an indirect pathway from the force main to the streambank or an alternate source of contamination, possibly the Main Street sewer line or a service lateral. Further tests could be to place smoke candles in the contaminated pipes and look for smoke in the sanitary sewer manholes. It may be possible to use acoustic leak detection on the force main also. page 4. . January 14, 2010



Figure 4. Outfall RF-010X, September 17, 2009.

Recommendations:

- A connection has been confirmed between the sanitary sewer and outfall pipes RF-045 and RF-050. We suspect a leak in the sanitary sewer in the vicinity of the stormsewer pipe crossing. We recommend further discussions with the Vermont Rural Water Association to locate the connection(s), followed by repairs. Camera inspection may be the best next step.
- 2. The possibility that an undocumented sanitary sewer overflow pipe may exist in manhole SMH#9-A should be further investigated.
- 3. Because dye testing was inconclusive, further investigation of the cluster of contaminated pipes discharging to the river bank between the Sunoco station and TD Bank should be performed. We recommend as a next step smoke testing pipes RF-10X and RF-10Z.

page 5. . January 14, 2010

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com

cc : Jim Pease, Vermont Department of Environmental Conservation Rich Mackay, Simon Operating Service Wayne Graham, Vermont Rural Water Association

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APPENDIX G: DEC MEMORANDUM ON MSGP STATUS OF

BLUE SEAL FEEDS

STONE ENVIRONMENTAL INC

Vermont Agency of Natural Resources Department of Environmental Conservation

Water Quality Division Building 10 North 802-241-3777

MEMORANDUM

To: File 6396-9003 Blue Seal Feeds

From: Thomas A. Benoit Sr, Environmental Analyst, DEC Stormwater Management Program Christina Hutchinson, Environmental Analyst, DEC Stormwater Management Program

Date: March 17, 2011

Subject: Multi Sector General Permit (MSGP) Status

On August 13, 2010 Kent Nutrition Group, DBA Blue Seal Feeds, received Multi Sector General Permit (MSGP) coverage for their facility, Blue Seal Feeds, located on 1 Webster Street in Richford, Vermont.

Blue Seal Feed (SIC code 2047 and 2048): consisting of the production of grain mill products, including the receipt of raw materials, and the loading of trucks for delivery of the final product are all conducted undercover. As such, Blue Seal Feeds examined the following potential sources of pollution:

- Contaminants from intermittent; outside vehicle maintenance or washing off trucks
- Contaminants from intermittent; maintenance of outside production equipment
- leaks of oils and other fluids from vehicles entering, leaving and/or parked on site
- Road salts from vehicles entering, leaving and/or parked on site
- Underground storage tanks (listed with State)
- Discharge from steam boilers blow down
- Floor drains for unexpected water flow
- Roof and lot residue; leaves, bird droppings, blown grain
- Rail Road siding and train/cars

In order to minimize these potential sources of pollution, Blue Seal Feeds has implemented Best Management Practices (BMP's) for vehicle washing, bulk truck/train unloading area cleaning, fueling operations, vehicle maintenance, boiler blow down and general housekeeping items (i.e., trash, bird droppings, general facility cleaning, etc.) to reduce their risk of stormwater contamination.

Quarterly and annual monitoring will also be conducted in compliance with the permit to gauge the effectiveness of their BMP's. Any areas of concern identified via testing and monitoring will be addressed through additional BMPs and monitoring.

APPENDIX H: LETTER TO VILLAGE OF SWANTON

STONE ENVIRONMENTAL INC

November 3, 2009

Mike Menard Director of Public Works Village of Swanton 120 First St., P.O. Box 279 Swanton, VT 05488

SEI No. 082119-W RE: Swanton IDDE results to date STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

Dear Mike:

This letter is to summarize the results of the illicit discharge detection and elimination project in Swanton. I apologize for the delay in getting these data to you.

The assessment we performed with your assistance between July and September 2009 pointed to contamination in five stormsewer systems in Swanton. Two of these systems—the system draining Canada Street and adjoining side streets and discharging via Webster Terrace at outfall SW-170 and the "ravine" system discharging at the Marble Mill Park at outfall SW-140—are extensive. In these systems, we began our assessment by sampling dry-weather flows at multiple locations rather than sampling only at the outfall. This was done to increase the likelihood that contaminated dry weather flows entering farther up the system would be detected prior to flow dilution and chemical dissipation. This proved to be a good strategy because in the ravine system we detected multiple locations where contaminated flow was present despite finding almost no detectable contaminants at the outfall. Also, outfall SW-170 from the Canada Street system was surcharged by the Missisquoi River when assessed; therefore sampling up-pipe from the outfall was essential.

The following tables summarize the water quality data obtained from the initial assessment and followup investigations of the five stormwater systems passing contaminated dry weather flows. There is a table for each stormwater system. A supporting data table (Table 6) is also included summarizing all the results of the initial assessment (7/28-8/3/09) plus follow-up sampling for *E. coli* and total phosphorus analysis at selected outfalls.

Table 1: Investigation of the SW-140 Stormsewer System (Ravine System)

Description: 24-inch diameter metal outfall pipe in Marble Mill Park from the stormwater system draining most of the south side of the Village of Swanton. This system will be referred to as the "ravine" system. The main stormsewer lines in this system were formerly used as sanitary sewer.

Contamina	nts: Amr	nonia, optical brightener, fluoride, petroleum odor		
Visit Date		Observation		
7/28/09,	Ammo	nia, detergents, and optical brightener were not detected at the ravine system outfall		
8/3/09	(SW-14	40), although a petroleum odor was observed. Among the nine other structures in this		
	system	assessed on 7/28/09 and 8/3/09, optical brightener was detected in two structures		
	(manho	ole SW-070 on New St. and manhole SW-090 on the bike path down-pipe from SW-		
	070), el	levated fluoride was detected at one structure (catchbasin SW-120 on Ferry St.), and a		
	petrole	um odor was detected at two structures (manhole SW-110 on Ferry St. and catchbasin		
	SW-22	0 on New St.).		
8/18/09	0	SW-070 is a manhole in the center of New St. between 2 nd St. and Platt St. Optical		
		brightener was detected in the manhole sump on 7/28/09. On 8/18/09, the three		
		pipes discharging to this manhole were sampled independently. No ammonia,		
		detergent, or fluoride was detected in the new stormline, which discharges via a		
		pipe from catchbasin SW-220. The old sewer line now converted to storm had a		
		low (0.3 mg/L) concentration of fluoride, but no ammonia or detergents. However,		
		a pipe leading from the direction of a small trailer park had elevated ammonia (0.7		
		mg/L). There is no apparent connection between this pipe and any surface drain.		
		Based on the ammonia detection in the flow from this pipe and the optical		
		brightener detection in the manhole SW-070 sump, we suspected an illicit		
		connection to this pipe.		
	0	No petroleum odor was observed in catchbasin SW-220 or manhole SW-070.		
9/1/09,	0	Traced the fluoride detected previously at catchbasin SW-120 up the Ferry St.		
9/8/09		stormline to the top of the system at the intersection of Grand Ave. and 1 st St.		
		Identified a pond with a fountain and overflow structure near the intersection of		
		Grand Ave. and 1st St. discharging fluoridated (drinking) water to the stormline on		
		Grand Ave. This discharge was sampled at pipe SW-119-A discharging to		
		catchbasin SW-119 (refer to attached field notes) and found to have a fluoride		
		concentration of 0.9 mg/L, which is a typical concentration of undiluted tapwater.		
		This pond appears to be the source of the fluoride detected in the Ferry St.		
		stormline at structure SW-120.		
	0	Observed elevated ammonia (1.0 mg/L) and a strong petroleum odor in catchbasin		
		SW-111 on Ferry St. (see field notes). The contaminated flow enters catchbasin		
		SW-111 through a crack in the north side of the basin. This catchbasin discharges		
		directly to manhole SW-110 on Ferry St., which is on the main stormline of the		

			ravine system.
		О	On Greenwich St., a stormline (SW-074-B) discharges to the main ravine system
			line at manhole SW-074. Ammonia (0.25 mg/L) and strong odor were detected in
			flow from this stormline.
		О	Attempted to trace the low level fluoride detected at manhole SW-070 up the new
			stormline on New St. to Second St. and Liberty St. At all sampled points, fluoride
			concentrations were at or below the limit of detection of 0.3 mg/L. No further
			action recommended.
		0	To identify the source of optical brightener at manhole SW-070 on New St., pads
			were placed in the pipes discharging to the manhole. No optical brightener was
			detected in the old sewer line converted to storm and none was detected in the pipe
			leading from the direction of the trailer park. During the initial assessment, no
			optical brightener was detected in catchbasin SW-220; therefore the stormline
			from SW-220 to SW-070 was not retested. Therefore, despite a strong detection of
			optical brightener in the sump of manhole SW-070 during the initial assessment
			(7/28/09), no optical brightener was detected in any of the three influent
			stormlines.
9/3/09		Tests a	t outfall SW-140: <i>E. coli</i> = 100 MPN/100 mL; Total phosphorous = 0.024 mg/L;
		Discha	rge = 0.99 L/s
Recom	menc	lation:	
1)	Det	ermine i	f an alternate source of water can be provided for the pond at the intersection of
	Gra	nd Ave.	and 1 st St. other than treated drinking water.
2)	Fur	ther inve	estigate the source of contaminated flow (elevated ammonia and petroleum odor)
	disc	harging	from a crack in the side of catchbasin SW-111 on Ferry St.
3)	Fur	ther inve	estigate the pipe discharging to manhole SW-070 on New St. from the direction of
	the	trailer pa	ark. This pipe discharges dry weather flow despite there being no connection to
	surf	ace draii	ns. This discharge had an elevated ammonia concentration (0.7 mg/L) on 8/18/09
	and	we susp	ect it is the source of the initial optical brightener detection in the sump of manhole
	SW	-070, des	spite the fact that optical brightener was not detected when retested in September.
	We	recomm	end smoke testing this line.
4)	Fur	ther inve	estigate the source of the contaminated flow (ammonia and odor) discharging from
	the	Greenwi	ich St. stormline to the trunk line of the ravine system at manhole SW-074. We
	reco	mmend	inspection of the stormsewer line using a closed circuit television camera. The line
	may	need to	be cleaned prior to inspection.

Table 2: Inv	Table 2: Investigation of the SW-150 Stormsewer System			
Description:	SW-150 is an 8-inch diameter PVC outfall pipe discharging to the Missisquoi River			
immediately	north of the tennis courts in Marble Mill Park.			
Contamina	nt: Optical brightener			
Visit Date	Observation			
7/28/09	Tests at outfall SW-150: Ammonia = 0.0 mg/L; Detergents (MBAS) = 0.0 mg/L; Fluoride =			
	0.1 mg/L; Specific conductance = 1098 µs/cm; Optical Brightener = Positive (weak); Orange			
	(iron) deposits at outfall.			
8/27/09	Set an optical brightener pad at the outfall and at the next catchbasin up the stormline			
	(SW-148) from the outfall. Optical brightener was detected at the outfall but not at			
	catchbasin SW-148.			
9/3/09	Tests at outfall SW-150: <i>E. coli</i> < 20 MPN/100 mL; Total phosphorous = 0.010 mg/L;			
	Discharge = 0.016 L/s			
Recommendation: We do not know the source of the optical brightener apparently entering this				
stormline between the most down-pipe catchbasin and the outfall. We suspect that the groundwater is				
contaminated from a leak in the sanitary sewer and that the contaminated groundwater infiltrates the				
stormline. We recommend inspection of the stormsewer line between the outfall and the first catchbasin				
up from the outfall using a closed circuit television camera. The line may need to be cleaned prior to				
inspection.	inspection.			

Table 3: Investigation of the SW-170 Stormsewer System (Canada Street and connecting streets)

Description: At the intersection of Canada St. and Broadway St., there are two connected manholes (SW-035 and SW-040) into which multiple storm and old sewer lines flow. SW-035 discharges to the stormline which outfalls at the Missisquoi River in Marble Mill Park via a 24-inch diameter concrete pipe (SW-170). The incoming pipes to manhole SW-035 include the line from manhole SW-040, two new stormlines draining eastern and western Canada St., and the stormline from a single catchbasin located at the corner of Webster Terrace. See accompanying schematics for clarification. The incoming pipes to manhole SW-040 are three old sewer lines (one from the west and two from the east) plus the stormsewer draining Broadway St. The old sewer lines discharging to manhole SW-040 do not appear to have any connection to surface drains.

Contaminants: Optical brightener, fluoride, ammonia.

Visit Date

	0	Outfall SW-170 was not assessed because it was surcharged by the Missisquoi
		River. At the intersection of Canada St. and Broadway St., optical brightener was
		detected in the sump of manhole SW-040. The lid of manhole SW-035 could not
		be pried open, therefore this structure was not assessed on this date.
	0	From manhole SW-035 proceeding east up the Canada St. stormline, elevated
		fluoride (0.5 mg/L) was detected at manhole SW-020, which is just west of the
		Green St. intersection. Farther up the Canada St. line, fluoride was not detected
7/28/09		at manhole SW-010, between the intersections of New St. and Liberty St. Nor
		was fluoride detected in the catchbasin on Spring St. closest to the Canada St.
		intersection.
	0	From manhole SW-035 proceeding west down Canada St., optical brightener and
		elevated fluoride (0.8 mg/L) were detected at the next manhole (SW-050).
	0	The manhole on the west side of York St., immediately north of the intersection
		of York St. and 1 st St., had elevated detergents (0.6 mg/L) but no ammonia,
		fluoride, or optical brightener.
8/18/09	0	All pipes discharging to manholes SW-40 and SW-35 at the intersection of
		Canada St. and Broadway St. were tested for fluoride and ammonia. At SW-040,
		elevated fluoride concentrations (0.5-0.7 mg/L) were found in dry weather flow
		from all three old sewer lines. Ammonia was not detected in flow from the old
		sewer lines. At SW-035, the stormlines draining eastern and western Canada St.
		had fluoride concentrations of 0.3 and 0.5 mg/L, respectively, and no detectable
		ammonia. The stormline from the single catchbasin located at the corner of
		Webster Terrace was dry.
	0	The flow from the Broadway St. stormline to manhole SW-040 had both elevated
		fluoride (0.4 mg/L) and ammonia (0.5 mg/L). Optical brightener was detected in
		the sump of manhole SW-040 on 7/28.09. These results suggest a sanitary
		wastewater connection to the Broadway St. stormline. The next upstream
		structure (SW-045) on Broadway St. was dry and the optical brightener test was
		negative.
	0	From manhole SW-035 proceeding east up the Canada St. stormline, elevated
		fluoride (0.3 mg/L) was detected in catchbasin SW-025, which is the only access
		point on the Canada St. line between SW-035 and SW-020.
	0	From manhole SW-035 proceeding west on Canada St., elevated fluoride (0.6
		mg/L) was again detected at the next manhole (SW-050). Continuing up the line

		to manhole SW-052 at the intersection of Canada St. and York St., flow from the
		York St. line had a fluoride concentration of 0.6 mg/L, while the line from farther
		west on Canada St. was dry.
	0	Continuing up York St., all structures had elevated fluoride (0.5-0.6 mg/L) up to
		manhole SW-060, which was not flowing.
	0	Structures on York St. were tested for detergents due to the detection of
		detergents in structure SW-060 on 7/28/09; however, no detergents were detected
		and manhole SW-060 was dry. Note that the detergents detected on 7/28/09 were
		not laundry detergents, because optical brightener was not detected.
	0	At manhole SW-061, which is down-pipe from manhole SW-060 near the bank
		building on York St., water was observed bubbling up through the floor of the
		manhole.
	0	Optical brightener pads were set in the sumps of manhole SW-035 (intersection
		of Canada St. and Broadway St.), manhole SW-052 (intersection of Canada St.
		and York St.), and SW-054 (first catchbasin up York St.). Optical brightener was
		detected in all three locations.
8/27/09	Attemp	oted to bracket location of fluoride entry in eastern Canada St. stormline. Fluoride
	level at	manhole SW-020 was 0.5 mg/L. Proceeding further up the line, the fluoride
	concen	tration in manhole SW-012 at the intersection of New St. was below the limit of
	detecti	on of 0.3 mg/L. No structures further up the line had detectable fluoride levels.
9/8/09	Optica	l brightener pads were set in three structures on York St. Optical brightener was
	detecte	ed in SW-061 (the manhole with flow bubbling up through the floor) and the two
	down-	pipe structures (manhole SW-055 and catchbasin SW-054).
	Tests a	t outfall SW-170: <i>E. coli</i> = 60 MPN/100 mL; Total phosphorous = 0.013 mg/L;
	Discha	rge = 1.3 L/s

Recommendations:

- Inspect the water line along Canada St. from York St. to New St. The fact that we consistently
 detected fluoride in multiple locations along the new stormline and also detected fluoride in
 the three old sewer lines discharging to manhole SW-040 (intersection of Canada and
 Broadway) suggests a moderate to large leak in the water distribution system that is infiltrating
 the Canada St. stormsewer and old sewer lines.
- 2) Identify the source of the contaminated flow entering structure SW-061 on York St. This flow is the suspected source of the optical brightener and fluoride that are detectable at multiple structures between SW-061 and manhole SW-035 at the intersection of Canada St. and

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Broadway. This may be a wash water or gray water source.

 Inspect the Broadway St. stormline between Canada St. and the first catchbasin up Broadway St. for a possible sanitary wastewater connection using a closed circuit television camera or other method.

Table 4: Investigation of the SW-290 Stormsewer System

Description: 18-inch diameter outfall pipe discharging to the Missisquoi River, on the left bank, immediately upstream of the Depot Street bridge.

Contaminants: Ammonia, E. coli, phosphorus

Visit Date	Observation	
8/4/09	Tests at outfall SW-290: Ammonia = 0.25 mg/L; Detergents (MBAS) = 0.1 mg/L; Fluoride =	
	0.4 mg/L; Specific conductance = 1325μ s/cm; Optical Brightener = Negative	
8/19/09	Visited outfall SW-290. Noted odor and blackened appearance of discharge	
8/27/09	Traced ammonia from outfall SW-290 to catchbasin SW-296, the closest accessible point	
	down-pipe from Poulin Grain plant property. Noted strong odor and suds present at the	
	outfall. Ammonia concentration = 2 mg/L at the outfall and at catchbasin SW-296.	
9/1/09	Village of Swanton Public Works Director confirmed connection of catchbasin SW-296 down-	
	pipe from Poulin Grain plant to municipal stormwater outfall SW-290.	
9/3/09	Tests at outfall SW-290: <i>E. coli</i> > 4,000 MPN/100 mL; Total phosphorous = 0.55 mg/L;	
	Discharge = 0.045 L/s	
9/24/09	Sampled catchbasin SW-296 down-pipe from Poulin Grain plant : E. coli = 8,700 MPN/100	
	mL; Total phosphorus = 1.3 mg/L; Ammonia = 1.0 mg/L; Detergents (MBAS) = 0.2 mg/L	
Recommendation: Contamination present at municipal stormwater outfall SW-290 apparently originates on		
the Poulin Grain plant property. The Vermont Department of Environmental Conservation will notify the		
Poulin Grain plant about this contaminated dry-weather flow and seek correction.		

Table 5: Investigation of the SW-300 Stormsewer System

Description: 40-inch diameter box culvert spanning North River Street. The upstream end of the culvert was sampled as SW-300. The culvert outlet was not assessed because it was on private property. A swale discharges to culvert SW-300 from the north via a culvert under Brooklyn Street. A closed drainage system discharges to culvert SW-300 from the south.

Contaminant: Fluoride

Visit Date	Observation
8/4/2009	Tests at culvert SW-300: Ammonia = 0.0 mg/L; Detergents (MBAS) = 0.0 mg/L; Fluoride =
page 8 . . November 3, 2009

	0.7 mg/L; Specific conductance = 1370μ s/cm; Optical Brightener = Negative; strong odor
8/27/2009	Culvert SW-300 was dry. Sampled culvert under Brooklyn Street (SW-300-A), upstream of
	culvert SW-300: Fluoride = 0.2 mg/L (below detection).
9/3/2009	Tests at culvert SW-300: <i>E. coli</i> = 160 MPN/100 mL; Total phosphorous = 0.39 mg/L;
	Discharge = 0.052 L/s. The swale to the north was flowing to the culvert and the closed
	drainage system to the south was trickling.
9/8/2009	Culvert SW-300 was dry.
Recommend	lation: We suspect an intermittent release of treated drinking water to the swale north of the SW-
300 culvert.	The odor observed on 8/4/09 may be attributable to a road kill animal observed later. No action.

Overall, we strongly encourage the Town to engage Vermont Rural Water to inspect the indicated stormlines. I am aware that Vermont Rural Water charges a camera maintenance fee, but that their services are otherwise free of charge. There is a possibility this project could reimburse the Town for a portion of the camera maintenance fee. I will contact you soon to answer any questions you have about these data and discuss next steps.

Sincerely yours,

Dave Bram

Dave Braun Water Quality Scientist II

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com 0:Proj-08/WFRM2119-W Missiquoi Touens IDDE/Correspondence/Menard_110309.docx

				•	•	•		-		•		
		Date	Ammonia	Sn conductance	Deternents	Fluoride			Date	F coli	Total	Discharge
Structure ID	Structure type	assessed	(mg/L)	(ms/cm)	(mg/L)	(mg/L)	Optical brightener	Comment	sampled	(MPN/100 mL)	(mg/L)	(L/s)
SW-010	manhole	7/28/09	0.0	547	0.0	0.1	Negative					
SW-020	manhole	7/28/09	0.0	437	0.0	0.5	Negative					
SW-030	catchbasin	7/28/09	0.0	469	0.0	0.0	Negative					
SW-040	manhole	7/28/09	0.0	572	0.0	0.0	Positive (weak)					
SW-050	manhole	7/28/09	0.0	667	0.0	0.8	Positive (weak)					
SW-060	manhole	7/28/09	0.0	166.4	0.6	0.0	Negative	foams when shaken				
SW-070	manhole	7/28/09	0.0	589	0.0	0.3	Positive					
SW-080	manhole	7/28/09	0.2	547	0.0	0.3	Negative					
060-WS	manhole	7/28/09	0.0	396	0.0	0.1	Positive (weak)					
SW-100	catchbasin	7/28/09										
SW-110	manhole	7/28/09	0.0	805	0.0	0.3	Negative	petroleum odor				
SW-120	catchbasin	7/28/09	0.0	495	0.0	9.0	Negative					
SW-130	catchbasin	7/28/09		Not flowin	gno sample c	ollected						
SW-140	outfall	7/28/09	0.0	592	0.0	0.3	Negative	slight petroleum odor	9/3/09	100	0.024	0.983
SW-150	outfall	7/28/09	0.0	1098	0.0	0.1	Positive (weak)	orange deposits	9/3/09	<20	0.010	0.016
SW-160	outfall	7/28/09	0.0	749	0.0	0.2	Negative	orange deposits				
SW-170	outfall	7/28/09		Outfall subme	rgedno samp	le collecte	q		9/3/09	60	0.13	1.306
SW-180	outfall	7/28/09		Not flowin	gno sample c	collected						
SW-190	outfall	8/3/09	0.0	686	0.0	0.0	Negative					
SW-200	outfall	8/3/09		Not flowin	gno sample c	collected						
SW-210	outfall	8/3/09		Could not loo	cateno sampl	e collected						
SW-220	catchbasin	8/3/09	0.0	375	0.0	0.0	Negative					
SW-230	catchbasin	8/3/09	NS	NS	NS	NS	Negative					
SW-240	catchbasin	8/3/09	Coulc	d not open coverno ;	sample collecte	pé	Negative					
SW-250	catchbasin	8/3/09	0.2	336	0.0	0.0	Negative					
SW-260	catchbasin	8/3/09		Not flowin	gno sample c	collected						
SW-270	outfall	8/3/09	0.2	282	0.0	0.0	Negative	orange deposits				
SW-280	outfall	8/4/09	0.0	415	0.0	0.1	Negative	flow cloudy, sudsy				
SW-290	outfall	8/4/09	0.3	1325	0.1	0.4	Negative		60/2/6	>4,000	0.55	0.045
SW-300	box culvert	8/4/09	0.0	1370	0.0	0.7	Negative	strong odor	60/2/6	160	0.39	0.052
SW-310	culvert	8/4/09	0.0	750	0.0	0.1	Negative					

Table 6: Initial discharge assessment in Swanton, followed by sampling for *E. coli* and total phosphorus where necessary



STONE ENVIRONMENTAL INC			Name/Description:		
535 Stone Cutters Way Phone / 802.22 Montpelier, Vermont Fax / 802.229.5 05602 USA Web Site / ww	29.4541 5417 w.stone-env.com	MISS	Missisquoi IDDE		
SEI Project #: 05 2119-W		Client/S	Sponsor:		
SNOTO					
set pad in pi and ost	pe from F pipe	trail.	er direction		
	Decill	IN P	OB podo pickedup		
STUCIORE	KESU H				
SMOTOA (DST)	Nego	Inve	(9/21/09)		
SW070B (from trail)	er) Negi	stre	(9121109)		
			Data: 918/109		

Page: _____ of _____



5 squares = 1 inch

Page: _____ of ____



Signed: <u>CED</u>

Date: 911109 (918109)

Page: _____ of _____





5 squares = 1 inch

Page: _____ of ___









535 Stone Cutters Way Montpelier, Vermont 05602 USA

York St.

Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com Project Name/Description:

Missisquoi IDDE

pads picked up alling

SEI Project #: 08Z119-W

Client/Sponsor:

Set optical brightener pads 918109

OB Result

Structure

5N061

Positive

SWOSS Positive (strong)

SW054 Positive (strong)

Signed: Christine

Date:	9	21	109	
sales -				

Page: _____ of ___





Signed: _____

Date: 27/Aug/09 Page: _______ of ____

5 squares = 1 inch



535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602USAWeb Site / www.stone-env.com			issisquoi	IDDE
El Project #: oら	1694-05	Client	/Sponsor:	
sample	Ammonics (ppm)	Detergents (ppm)	F & Mg/L	<u>O'B</u>
SW 2.80	0	0	0	
SW-OZO	N3 0.0	NS	0.5	
SWOIZ	NS	NS	0.2	
SNOID	NS	NS	0.0	
SWOOG	NS	NS	0.1	
SW 20 D	NS	NS	0.2	
SN 300 A	NS	NS	0.2	
SW				
* F calibratic	in reading	= 0.9 mg1	e Did N	OT calibrate

Signed: _____CO

Date:	281	rtug	109	

Page: _____ of ____



STONE ENVIRONMENTAL INC	Project Name/Description:
535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602USAWeb Site / www.stone-env.com	Missisqual IDDE
SEI Project #: のきていターW	Client/Sponsor: DをC
8/18 Investagatoon SW-280 Retriavez Paz. Flow was Substanticul foam, after Smallez Somewhat of S SW-290 At west size of Ma	turbs 1 and brown with - brief thundershower. - ptsc. No sample collected.
Flow has a strong so Rocks and pipe ap strongly reducing c	nell difficult to define. pear blackened. Suspect on liteons present.



Page: _____ of ____



Page:_____ of____

STONE ENVIRONMENTAL INC	Project Name/Description:
535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602 USAWeb Site / www.stone-env.com	Missisquoi IDDE
SEI Project #: 08 2119-W	Client/Sponsor:
SW296 CB below Po	whin Grain
Ammonia = 1ppm	
Detergents = 0.2	
igned: CED	Date: 9/24/09
squares = 1 inch	Page: of

)



TIONIC AND DEMADVE

STONE ENVIRONMENTAL INC	Project Name/Description:
535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602USAWeb Site / www.stone-env.com	Missignoi IDDE
El Project #: 082119-W	Client/Sponsor:
SW 300	
Took supple from SW30	DDA at inlet. Btm of
which was accorded and	madele to made where to
outlet was corrected and	Unable 10 really water 10
sample.	
Pipe Abwing to outlet	was dry as well as pipe
Discourse Davallat 1) Piño	
FIDWING paramet N MIVE	I St.
0	[4] J. Kennik and J. Kennik and S. M. Shanak and S. Kennik and S. Ken
U	
0	
Swale flow	
Swale flow Flow	
Swale Alow Flow	
Swale flow Flow	

Signed: Christino

Date:	- 81	271	09	

Page: _____ of _

DEEDVATIONS AND DEMADICS

STONE ENVIRONMENTAL INC	Project Name/Description:				
535 Stone Cutters WayPhone / 802.229.4541Montpelier, VermontFax / 802.229.541705602 USAWeb Site / www.stone-env.com					
SEI Project #:	Client/Sponsor:				
9/3/09 visit - SW300					
Flow coming from swale ac	noss road				
Small trickle from side att	ached to catch basins				
sampled ecoli + TP @ inlet	to outfall pipe.				

Signed: __

Date: 911/09

APPENDIX I: STONE ENVIRONMENTAL INC. LETTER TO

POULIN GRAIN

STONE ENVIRONMENTAL INC

November 19. 2009

Poulin Grain Attn: Kevin Lussier 24 Railroad Square Newport, VT 05855

STONE ENVIRONMENTAL INC

535 Stone Cutters Way Montpelier, Vermont 05602 USA Phone / 802.229.4541 Fax / 802.229.5417 Web Site / www.stone-env.com

SEI No. 082119-W RE: Suspected contamination of Village of Swanton stormsewer from Poulin Grain facility

Dear Mr. Lussier:

My name is Dave Braun. I am a consultant with Stone Environmental, Inc. working on an illicit discharge detection and elimination project in Swanton. Between July and September 2009, Stone Environmental, Inc. conducted an assessment of municipal stormwater drainage systems in the Village and Town of Swanton to identify sources of contaminated dry-weather flows.

One of the stormwater drainage systems we assessed discharges via an 18-inch diameter pipe to the Missisquoi River immediately upstream of the Depot Street bridge. This stormwater outfall is labeled SW-290 in the attached map. We found elevated bacteria (*Escherichia coli*), phosphorus, and ammonia concentrations in samples collected at outfall SW-290 during dry weather conditions. Our investigation of this stormwater drainage system indicates that the contaminated flow may originate on the Poulin Grain property in Swanton. We are basing this conclusion on the fact that catchbasin SW-296 (see attached map), which receives flow from the stormwater collection system on the Poulin Grain property, also had similarly elevated *Escherichia coli*, phosphorus, and ammonia concentrations. The following is a summary of test data for this stormwater system.

Visit	
Date	Observation
8/4/09	Tests at outfall SW-290: Ammonia = 0.25 mg/L; Detergents (MBAS) = 0.1 mg/L;
	Fluoride = 0.4 mg/L; Specific conductance = 1325 µs/cm; Optical Brightener =
	Negative
8/19/09	Visited outfall SW-290. Noted odor and blackened appearance of discharge
8/27/09	Traced ammonia from outfall SW-290 to catchbasin SW-296, the closest
	accessible point down-pipe from Poulin Grain plant property. Noted strong odor
	and suds present at the outfall. Ammonia concentration = 2 mg/L at the outfall
	and at catchbasin SW-296.

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9/1/09	Village of Swanton Public Works Director confirmed connection of catchbasin
	SW-296 down-pipe from Poulin Grain plant to municipal stormwater outfall SW-
	290.
9/3/09	Tests at outfall SW-290: <i>E. coli</i> > 4,000 MPN/100 mL; Total phosphorous = 0.55
	mg/L; Discharge = 0.045 L/s
9/24/09	Sampled catchbasin SW-296 down-pipe from Poulin Grain plant : <i>E. coli</i> = 8,700
	MPN/100 mL; Total phosphorus = 1.3 mg/L; Ammonia = 1.0 mg/L; Detergents
	(MBAS) = 0.2 mg/L

Abbreviations: MBAS = methylene blue active substances; MPN = most probable number

The approach we have historically taken when contamination is found through illicit discharge detection investigations is to work cooperatively with the municipality or the private property owner to identify and eliminate the specific source of the contamination. If the contaminated dry weather flow in the municipal stormwater system does indeed arise on your property, as it appears to do, we are confident you'll recognize the need for an expedient solution to the problem. In this spirit, I would appreciate an opportunity to discuss this matter with you in the near future. Please contact me at your earliest convenience at:

Dave Braun Stone Environmental, Inc. 535 Stone Cutters Way Montpelier, VT 05602 Phone: 802-229-5379 Cell: 802-272-8819 Email: dbraun@stone-env.com

Sincerely yours,

Dave Bran

Dave Braun Water Quality Scientist II

cc. Mike Menard, Director of Public Works, Village of Swanton

Direct Phone / 802-229-5379 E-Mail / dbraun@stone-env.com



Stormwater Drainage System Discharging at Outfall SW-290 Swanton, Vermont

APPENDIX J: DEC MEMORANDUM ON MSGP STATUS OF

POULIN GRAIN

STONE ENVIRONMENTAL INC

Vermont Agency of Natural Resources Department of Environmental Conservation

Water Quality Division Building 10 North 802-241-3777

MEMORANDUM

To: File 5744-9003 Poulin Grain, Inc.

- From: Thomas A. Benoit Sr, Environmental Analyst, DEC Stormwater Management Program Christina Hutchinson, Environmental Analyst, DEC Stormwater Management Program
- Date: March 17, 2011

Subject: Multi Sector General Permit (MSGP) Status

On June 30, 2008, Poulin Grain Inc. received MSGP coverage for their facility located on 24 Railroad Square in Swanton, Vermont.

Poulin Feeds, Inc. (SIC code 2047 and 2048): manufactures and produces grain mill products; including the receipt of raw materials. The loading of trucks for delivery of the final product are conducted undercover. As a result, Poulin Grain, Inc. examined the following potential sources of pollution:

- Contaminants from outside vehicle maintenance or washing off trucks
- Contaminants from maintenance of outside production equipment
- Bulk load/receiving areas (Train & Truck)
- Truck Refueling area
- Tank Farm Area

In order to minimize these potential sources of pollution, Poulin Grain Inc., has implemented Best Management Practices (BMPs) for vehicle washing, bulk truck/train unloading area cleaning, fueling operations, vehicle maintenance and general housekeeping items (i.e., trash, general facility cleaning, etc.) to reduce their risk of stormwater contamination.

Quarterly and annual monitoring is also conducted in compliance with the permit to gauge the effectiveness of their BMPs. Any areas of concern identified via testing and monitoring will be addressed through additional BMPs and monitoring.

Based on email correspondence and a site visit to the Poulin Grain Swanton Facility; Poulin Grain, Inc. submitted an amended Stormwater Pollution Prevention Plan (SWPPP) on June 14, 2010. This included among other BMPs, a catch basin clean out schedule.

On February 14, 2011 an amended SWPPP was submitted along with plans for a 24ft by 80ft wash bay for the Swanton Poulin Grain facility (designed by, Ruggiano Engineering). This wash bay includes a wash water holding tank to prevent potential pollutants from reaching adjacent catch basins. This plan is currently being reviewed.