

## TABLE OF CONTENTS

	<b>Page</b>
<b>CHAPTER 1 – INTRODUCTION .....</b>	<b>1-1</b>
1.1 Introduction .....	1-1
<b>CHAPTER 2 – METHODOLOGY AND COORDINATION .....</b>	<b>2-1</b>
2.1 Geology .....	2-1
2.1.1 Regulatory Framework .....	2-1
2.1.2 Data Collection and Methodology .....	2-1
2.2 Soils .....	2-1
2.2.1 Regulatory Framework .....	2-1
2.2.2 Data Collection and Methodology .....	2-2
2.3 Groundwater .....	2-3
2.3.1 Regulatory Framework .....	2-3
2.3.2 Data Collection and Methodology .....	2-4
2.4 Surface Water .....	2-4
2.4.1 Regulatory Framework .....	2-4
2.4.2 Data Collection and Methodology .....	2-7
2.5 Floodplains .....	2-13
2.5.1 Regulatory Framework .....	2-13
2.5.2 Data Collection and Methodology .....	2-14
2.6 Agency Consultation and Coordination .....	2-16
<b>CHAPTER 3 – EXISTING CONDITIONS .....</b>	<b>3-1</b>
3.1 Geology .....	3-1
3.2 Soils .....	3-1
3.2.1 Soil Series .....	3-1
3.3 Groundwater .....	3-5
3.4 Surface Water .....	3-6
3.4.1 Hydrology .....	3-6
3.4.2 Water Quality and Aquatic Biota .....	3-9
3.4.3 Stormwater Treatment Practices .....	3-11
3.5 Floodplains .....	3-13
3.5.1 Floodplains .....	3-13
3.5.2 Stream Geomorphology .....	3-14
3.5.3 Stream Crossing Structure Assessment .....	3-15
<b>CHAPTER 4 – IMPACTS AND MITIGATION .....</b>	<b>4-1</b>
4.1 Introduction .....	4-1
4.1.1 Context and Key Issues .....	4-1
4.1.2 Summary of Stormwater Best Management Practices .....	4-2
4.1.3 VTrans Deicing Best Management Practices .....	4-3
4.2 No Build Alternative .....	4-4
4.3 Geology .....	4-4
4.3.1 VT 2A Alternatives .....	4-4
4.3.2 Circ A/B Alternatives .....	4-5
4.3.3 Hybrid Alternatives .....	4-7
4.4 Soils .....	4-8
4.4.1 VT 2A Alternatives .....	4-8
4.4.2 Circ A/B Alternatives .....	4-11

4.4.3	Hybrid Alternatives .....	4-14
4.5	Groundwater .....	4-17
4.5.1	VT 2A Alternatives.....	4-17
4.5.2	Circ A/B Alternatives.....	4-18
4.5.3	Hybrid Alternatives .....	4-20
4.6	Surface Water .....	4-21
4.6.1	VT 2A Alternatives.....	4-21
4.6.2	Circ A/B Alternatives.....	4-25
4.6.3	Hybrid Alternatives .....	4-31
4.7	Floodplains.....	4-37
4.7.1	VT 2A Alternatives.....	4-37
4.7.2	Circ A/B Alternatives.....	4-38
4.7.3	Hybrid Alternatives .....	4-39
4.8	Summary of Impacts and Mitigation.....	4-40
4.8.1	VT 2A Alternatives.....	4-40
4.8.2	Circ A/B Alternatives.....	4-41
4.8.3	Hybrid Alternatives .....	4-42

## **CHAPTER 5 – REFERENCES .....** 5-1

### **LIST OF TABLES**

Table 2-1	Erosion Risk Based on Slope and Soil Erodibility.....	2-3
Table 2-2	Drainage Area Inputs used in the Simple Method .....	2-10
Table 2-3	Drainage Areas and Background Chloride Concentrations for Waterbodies with Measured Chloride Concentrations .....	2-12
Table 2-4	Drainage Areas, Lane-Miles and Background Chloride Concentrations for Waterbodies without Measured Chloride Concentrations.....	2-13
Table 2-5	Stream Geomorphic Assessment Terminology .....	2-15
Table 3-1	VT 2A Corridor Soil Characteristics .....	3-2
Table 3-2	Circ A/B Corridor Soil Characteristics.....	3-4
Table 3-3	VT 2A Corridor: Stream Hydrological Characteristics.....	3-8
Table 3-4	Circ A/B Corridor: Stream Hydrological Characteristics.....	3-9
Table 3-5	Impaired Waterways .....	3-10
Table 3-6	Existing Conditions Stormwater Runoff Pollutant Loadings.....	3-13
Table 3-7	VT 2A Corridor: Allen Brook Stream Geomorphic Assessment.....	3-15
Table 3-8	Circ A/B Corridor: Allen Brook Stream Geomorphic Assessment.....	3-15
Table 3-9	VT 2A Corridor: Stream Crossing Structure Assessment.....	3-16
Table 3-10	Circ A/B Corridor: Stream Crossing Structure Assessment.....	3-17
Table 4-1	Vermont Stormwater Treatment Criteria and Standards .....	4-3
Table 4-2	Alternative 2 Hydrologic Soil Group Encroachment.....	4-8
Table 4-3	Alternative 2 Construction Soil Disturbance .....	4-9
Table 4-4	Alternative 3 Hydrologic Soil Group Encroachment.....	4-9
Table 4-5	Alternative 3 Construction Soil Disturbance .....	4-10
Table 4-6	Alternative 22 Hydrologic Soil Group Encroachment.....	4-10
Table 4-7	Alternative 22 Construction Soil Disturbance .....	4-11
Table 4-8	Alternative 16a Hydrologic Soil Group Encroachment.....	4-11
Table 4-9	Alternative 16a Construction Soil Disturbance .....	4-11
Table 4-10	Alternative 16b Hydrologic Soil Group Encroachment.....	4-12

Table 4-11	Alternative 16b Construction Soil Disturbance .....	4-12
Table 4-12	Alternative 16c Hydrologic Soil Group Encroachment .....	4-13
Table 4-13	Alternative 16c Construction Soil Disturbance.....	4-13
Table 4-14	Alternative 17 Hydrologic Soil Group Encroachment.....	4-13
Table 4-15	Alternative 17 Construction Soil Disturbance .....	4-14
Table 4-16	Alternative 18 Hydrologic Soil Group Encroachment.....	4-14
Table 4-17	Alternative 18 Construction Soil Disturbance .....	4-15
Table 4-18	Alternative 19 Hydrologic Soil Group Encroachment.....	4-15
Table 4-19	Alternative 19 Construction Soil Disturbance .....	4-15
Table 4-20	Alternative 23 Hydrologic Soil Group Encroachment.....	4-16
Table 4-21	Alternative 23 Construction Soil Disturbance .....	4-16
Table 4-22	Alternative 2 Simple Method Results .....	4-21
Table 4-23	Alternative 2 Toler Analysis Results .....	4-22
Table 4-24	Alternative 3 Simple Method Results .....	4-22
Table 4-25	Alternative 3 Toler Analysis Results .....	4-23
Table 4-26	Alternative 22 Simple Method Results .....	4-24
Table 4-27	Alternative 22 Toler Analysis Results .....	4-24
Table 4-28	Alternative 16a Simple Method Results .....	4-25
Table 4-29	Alternative 16a Toler Analysis Results .....	4-26
Table 4-30	Alternative 16b Simple Method Results .....	4-27
Table 4-31	Alternative 16b Toler Analysis Results .....	4-27
Table 4-32	Alternative 16c Simple Method Results .....	4-28
Table 4-33	Alternative 16c Toler Analysis Results .....	4-29
Table 4-34	Alternative 17 Simple Method Results .....	4-30
Table 4-35	Alternative 17 Toler Analysis Results .....	4-30
Table 4-36	Alternative 18 Simple Method Results .....	4-31
Table 4-37	Alternative 18 Toler Analysis Results .....	4-32
Table 4-38	Alternative 19 Simple Method Results .....	4-33
Table 4-39	Alternative 19 Toler Analysis Results .....	4-34
Table 4-40	Alternative 23 Simple Method Results .....	4-35
Table 4-41	Alternative 23 Toler Analysis Results .....	4-36

## LIST OF FIGURES

Figure 3-1	Bedrock Geology: VT 2A Segment 1
Figure 3-2	Bedrock Geology: VT 2A Segment 2
Figure 3-3	Bedrock Geology: VT 2A Segment 3
Figure 3-4	Bedrock Geology: VT 2A Segment 4
Figure 3-5	Bedrock Geology: Circ A/B Segment 1
Figure 3-6	Bedrock Geology: Circ A/B Segment 2
Figure 3-7	Bedrock Geology: Circ A/B Segment 3
Figure 3-8	Bedrock Geology: Circ A/B Segment 4
Figure 3-9	Soil Series: VT 2A Segment 1
Figure 3-10	Soil Series: VT 2A Segment 2
Figure 3-11	Soil Series: VT 2A Segment 3
Figure 3-12	Soil Series: VT 2A Segment 4
Figure 3-13	Soil Series: Circ A/B Segment 1
Figure 3-14	Soil Series: Circ A/B Segment 2
Figure 3-15	Soil Series: Circ A/B Segment 3
Figure 3-16	Soil Series: Circ A/B Segment 4
Figure 3-17	Private Wells, Public Groundwater Sources and Water Source Protection Areas
Figure 3-18	Watersheds

Figure 3-19 Impaired Waterways and Biomonitoring Stations

Figure 3-20 Floodplains, Stream Geomorphic Assessment and Stream Crossing Structures