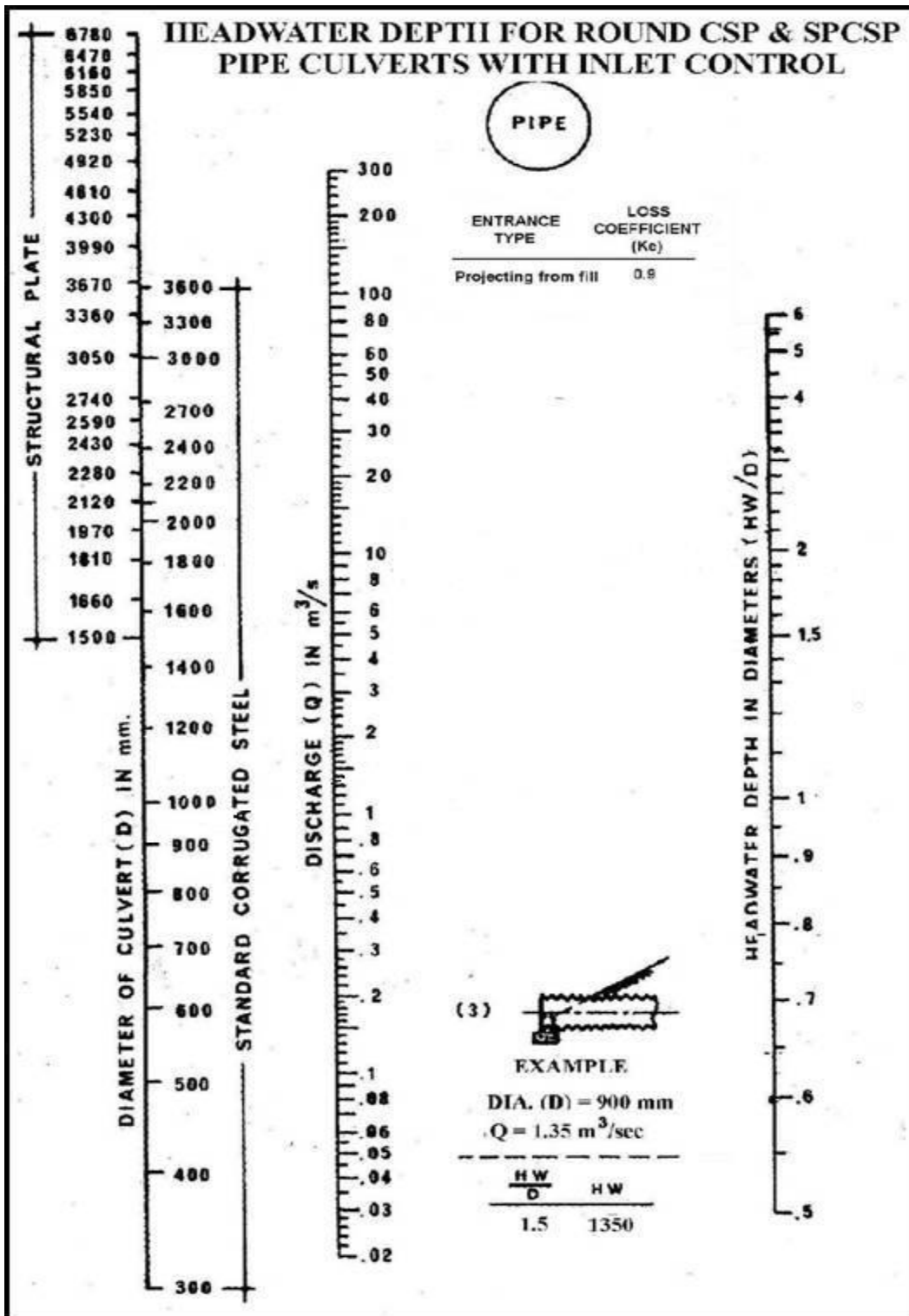


APPENDICES

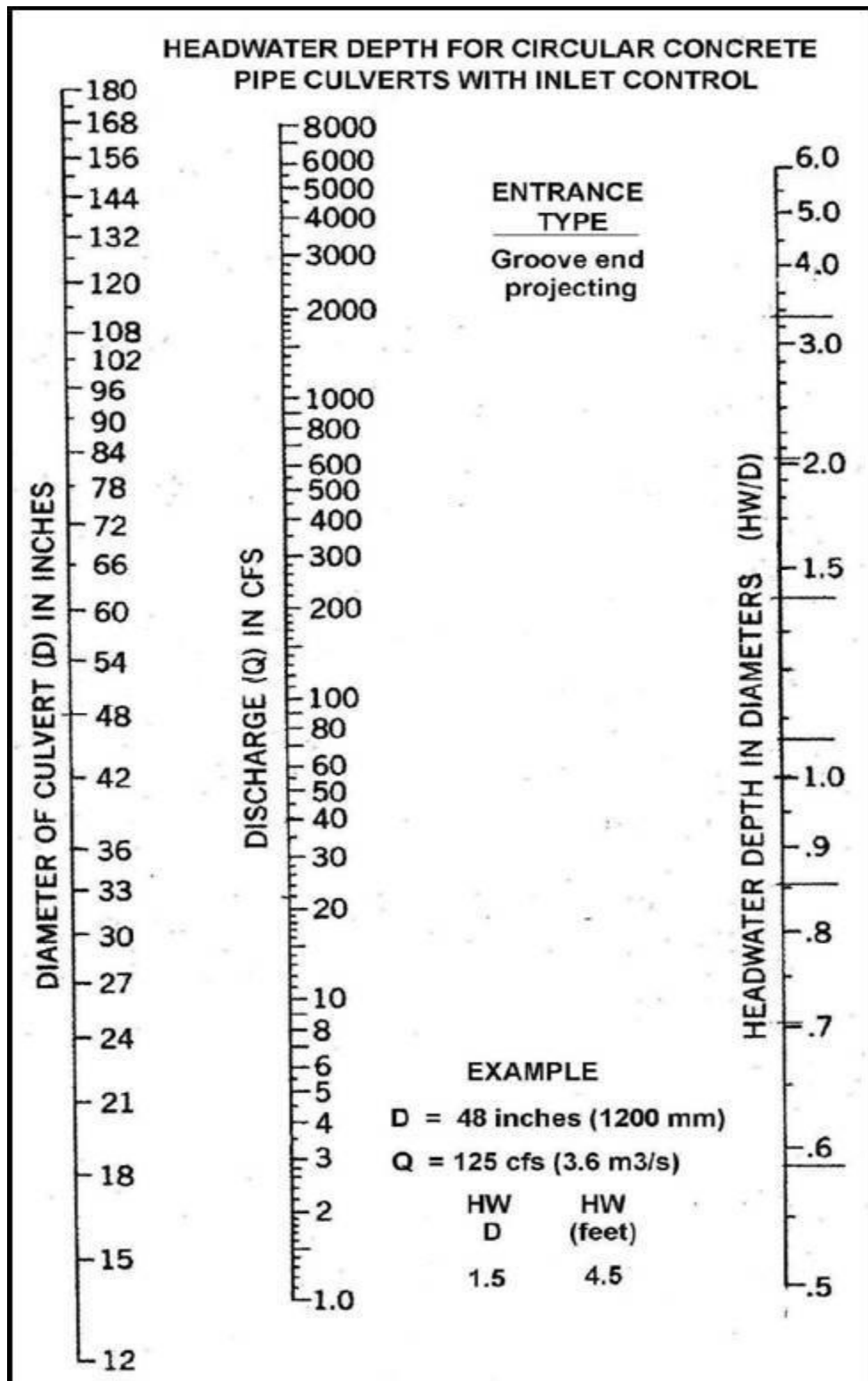
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APPENDIX A-1: CORRUGATED STEEL CIRCULAR PIPE



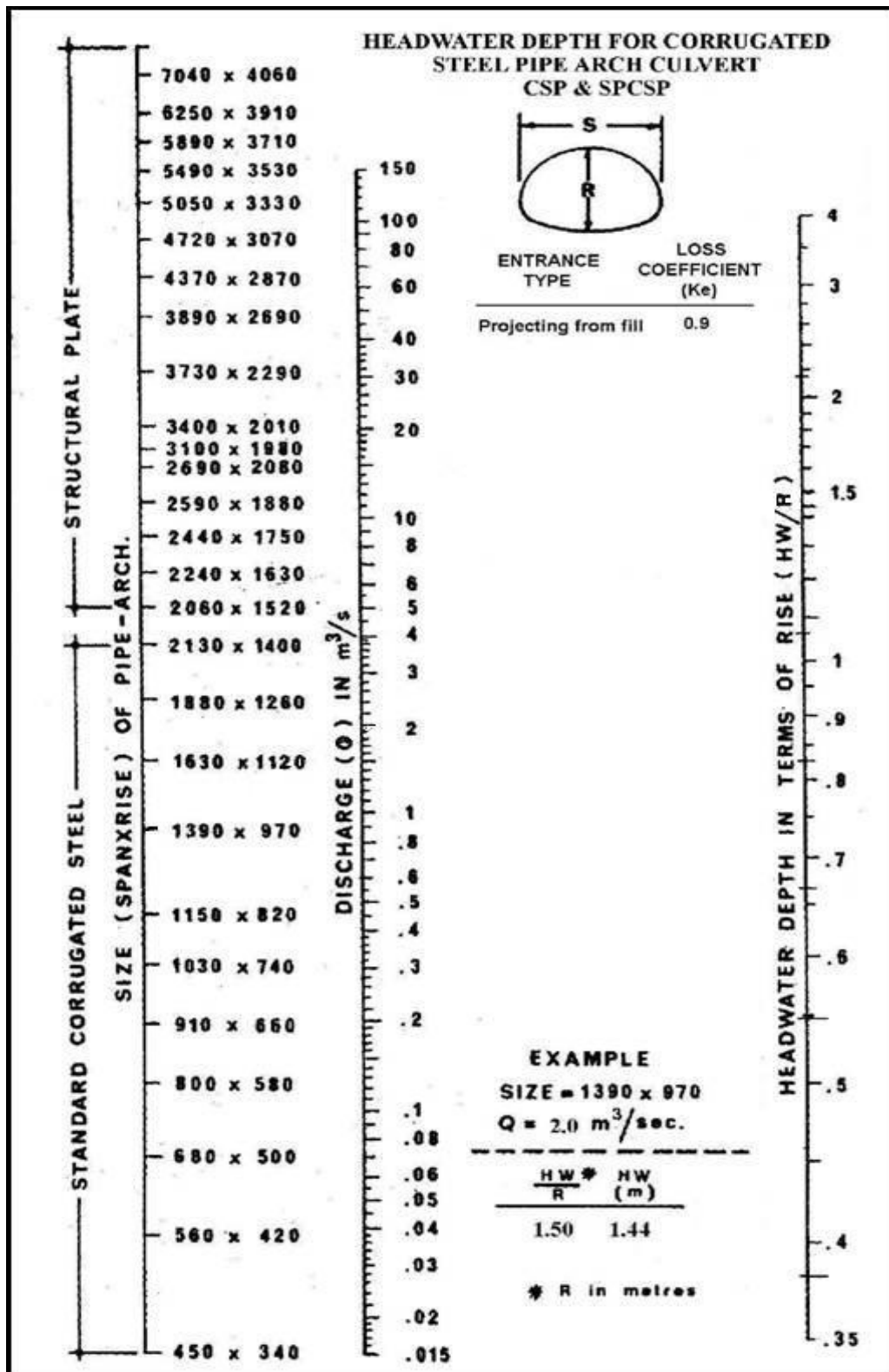
Data are derived from nomographs provided by the Bureau of Public Roads.

APPENDIX A-2: CONCRETE/PLASTIC CIRCULAR PIPE



Data are derived from nomographs provided by the Bureau of Public Roads.

APPENDIX A-3: CORRUGATED STEEL PIPE ARCH



Data are derived from nomographs provided by the Bureau of Public Roads.

APPENDIX B: CONVERSION TABLE

Conventional Culvert Sizes	
<u>Inches</u>	<u>Millimetres</u>
18	450
24	600
27	700
30	750
32	800
33	825
36	900
42	1000
48	1200
54	1400
60	1500
64	1600
66	1660
72	1800
78	1970
80	2000
84	2120
88	2200
90	2280
96	2430
102	2590
106	2700
108	2740
120	3050
118	3000
130	3300
142	3600

APPENDIX C: END AREA REDUCTIONS

End Area Reductions (Based on 0.2 (D) to a maximum of 0.45 m)					
Culvert diameter (D)	Radius	Depth of material in pipe	End area of culvert	Area occupied by material	End area remaining
mm	m	m	m ²	m ²	m ²
450	0.225	0.090	0.159	0.023	0.136
600	0.300	0.120	0.283	0.040	0.242
700	0.350	0.140	0.385	0.055	0.330
750	0.375	0.150	0.442	0.063	0.379
800	0.400	0.160	0.502	0.071	0.431
825	0.413	0.165	0.534	0.076	0.458
900	0.450	0.180	0.636	0.091	0.545
1000	0.500	0.200	0.785	0.112	0.673
1200	0.600	0.240	1.130	0.161	0.969
1400	0.700	0.280	1.539	0.219	1.320
1500	0.750	0.300	1.766	0.252	1.515
1600	0.800	0.320	2.010	0.286	1.724
1660	0.830	0.332	2.163	0.308	1.855
1800	0.900	0.360	2.543	0.362	2.181
1970	0.985	0.394	3.047	0.434	2.613
2000	1.000	0.400	3.140	0.447	2.693
2120	1.060	0.424	3.528	0.503	3.026
2200	1.100	0.440	3.799	0.541	3.258
2280	1.140	0.450	4.081	0.570	3.510
2400	1.200	0.450	4.522	0.587	3.934
2430	1.215	0.450	4.635	0.591	4.044
2590	1.295	0.450	5.266	0.613	4.653
2700	1.350	0.450	5.723	0.627	5.095
2740	1.370	0.450	5.893	0.632	5.261
2895	1.448	0.450	6.579	0.652	5.927
3000	1.500	0.450	7.065	0.665	6.400
3050	1.525	0.450	7.302	0.671	6.632
3300	1.650	0.450	8.549	0.701	7.848
3600	1.800	0.450	10.174	0.734	9.439

APPENDIX D: WATERCOURSE ALTERATION CERTIFICATION DATA SHEET

1. General Information

Site coordinates: Lat. _____ Long. _____

Property is listed under my name (or my organization): Yes No

If no, I have attached a consent letter to my application: Yes No

Certified individual responsible for calculations: _____
(for watercourse crossings + water withdrawals)

Certified individual responsible for onsite work: _____

Will the project result in a new footprint (beyond the toe of slope of an existing structure) greater than 100 m²?

Yes No

2. Type of Work

Also see the corresponding section indicated in ()

- Bank stabilization (biotechnical/rip-rap) ([Section 1](#))
- Beaver dam management and removal
- Bridge (permanent) – new/replacement of a single span ([Section 2](#))
- Bridge – maintenance
- Bridge removal
- Culvert – new/replacement ([Section 3](#))
- Culvert – extending an existing ([Section 4](#))
- Culvert maintenance
- Culvert removal
- Temporary bridge ([Section 5](#))
- Timber harvesting ([Section 6](#))
- Removal of non-merchantable woody vegetation ([Section 7](#))
- Water withdrawal ([Section 8](#))

Section 1: Bank stabilization (biotechnical/rip-rap)

Check one:

- Biotechnical (requires a P. Eng. drawing* if rock toe is included and greater than 30 metres in length)
- Rip-rap/armor stone – less than 30 metres in length
- Rip-rap/armor stone – more than 30 metres in length (requires a P. Eng. drawing*)

Height of the erosion protection product on the bank: _____

Length of the erosion protection product on the bank: _____

***scaled drawings (plan and cross-section) must be included with the application for review**

Section 2: Bridge (permanent) – new/replacement of a single span

Upstream drainage area (km²): _____

Design flow (m/sec): _____

Waterway opening (m²): _____
(end area)

Section 3: Culvert – new/replacement

Upstream drainage area (km²): _____

Design flow (m/sec): _____

Diameter (mm): _____

Headwater depth/diameter ratio: _____

Length (m): _____

Pipe material: _____

For replacements only:

Original pipe length (m): _____

New pipe length (m): _____

Check one:

- Open-bottom culvert
- Closed-bottom culvert watercourse slope 0.5%*
- Twin-pipes*

*The following information is required for review:

- Stream survey/cross section drawing

CULVERT LENGTH (L) = _____ DISSIPATION POOL ELEVATION (DPE) = _____ CULVERT SLOPE = _____

CULVERT DIAMETRE (D) = _____ UPSTREAM RIFFLE ELEVATION (URE) = _____ CULVERT DIAMETER = (D) _____

ROAD WIDTH (RW) = _____ DOWNSTREAM RIFFLE ELEVATION (DRE) = _____ CULVERT INLET ELEVATION = _____

HEIGHT OF ROAD (H) = _____ FINISHED ROAD ELEVATION (FR) = _____ CULVERT OUTLET ELEVATION = _____

FORESLOPE (FS) = _____ STREAM SLOPE (SS) = _____

ROAD NAME:	TYPICAL CROSS SECTION	Survey No.	Date
WATERCOURSE:		Project No.	
GRID REFERENCE:	SCALE NTS	DWG.NO.	OF

Section 4: Culvert – extending an existing

Original pipe length (m): _____

Final pipe length (m): _____

Total footprint of culvert and altered streambed (including energy dissipation pool) (m²): _____

Section 5: Temporary bridge

Drainage area (km²): _____

Waterway opening (m²): _____
(end area)

Section 6: Timber harvesting

PID(s) where harvesting is to take place: _____

Section 7: Removal of non-merchantable woody vegetation

PID(s) where harvesting is to take place: _____

Section 8: Water withdrawal

Upstream drainage area (km²): _____

Maximum pumping rate (litres/minute): _____

APPENDIX E: WETLAND IDENTIFICATION DATA SHEET

DELG Wetland Identification Data Sheet	
Project/Site:	
Site Visit Date:	
Investigator(s):	
PID:	GPS Coordinate:
Wetland Type (circle or highlight):	
Forested	Riparian Shrub
Fen/Bog	Marsh
	Aquatic Bed
Wetland Hydrology and Connectivity:	
Dominant Wetland Vegetation (3 species minimum):	
Dominant Upland Vegetation:	
Wetland Soil Description:	
Upland Soil Description:	
Additional Information (include photos and wetland limit on aerial imagery and/or site plans):	

APPENDIX F: WATERCOURSE IDENTIFICATION CHECKLIST

Site Visit Date:

Investigates by:

PID: _____

Latitude: _____ Longitude: _____

Station #	Transect Distance (m)	Bank Width (cm)	Meets Definition? * >0.5 m/ rock, soil substrate/defined channel
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Average width			

Notes: _____

Requirements

- A minimum of five width measurements must be taken upstream at representative areas of the natural stream, from the top of both stream banks. Dependant on length of stream these can be taken at 5-metre increments of greater or less depending on site specific information.
- If not possible, then measurements should be taken immediately after the crossing site downstream at representative areas.

APPENDIX G: DIRECTORY

NEW BRUNSWICK DEPARTMENT OF ENVIRONMENT AND LOCAL GOVERNMENT (DELG)

CENTRAL OFFICE

Fredericton	Marysville Place 20 McGloin St. Fredericton, NB, E3A 5T8	Phone (506) 457-4850 Email wawa@gnb.ca
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REGIONAL OFFICES

Bathurst	Regional Operations & Compliance 159 Main St., Suite 202 Bathurst, NB E2A 1A6	Phone (506) 547-2092 Fax (506) 547-7655
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Fredericton	Regional Operations & Compliance 20 McGloin St. Fredericton, NB E3A 5T8	Phone (506) 444-5149 Fax (506) 453-2893
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Miramichi	Regional Operations & Compliance 316 Dalton Avenue Miramichi, NB E1V 3N9	Phone (506) 778-6032 Fax (506) 778-6796
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Moncton	Regional Operations & Compliance 355 Dieppe Blvd Moncton, NB E1A 8L5	Phone (506) 856-2374 Fax (506) 856-2370
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Saint John	Regional Operations & Compliance 8 Castle Street Saint John, NB E2L 3B8	Phone (506) 658-2558 Fax (506) 658-3046
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Grand Falls	Regional Operations & Compliance 65 Broadway Blvd Grand Falls, NB E3Z 2J6	Phone (506) 473-7744 Fax (506) 475-2510
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ENVIRONMENT EMERGENCY

National Environmental Emergencies Center

1-800-565-1633 (24 hours/day)

NEW BRUNSWICK DEPARTMENT OF NATURAL RESOURCES AND ENERGY DEVELOPMENT (DNRED)

CENTRAL OFFICE

Fredericton	New Brunswick Department of Natural Resources and Energy Development (1350 Regent Street, E3C 2G6) P.O. Box 6000 Fredericton, NB E3B 5H1	Phone (506) 453-3826 Fax (506) 444-4367
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REGIONAL OFFICES

Bathurst (Region 1)	New Brunswick Department of Natural Resources and Energy Development 2570 Route 180 South Tetagouche, NB E2A 7B8	Phone (506) 547-2080 Fax (506) 547-2068
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Miramichi (Region 2)	New Brunswick Department of Natural Resources and Energy Development 80 Pleasant Street Miramichi, NB E1V 1X7	Phone (506) 627-4049 Fax (506) 627-4224
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Fredericton (Region 3)	New Brunswick Department of Natural Resources and Energy Development Fredericton HQ – Ancillary Building 1350 Regent Street Fredericton, NB E3C 2G6	Phone (506) 444-4888 Fax (506) 453-5237
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Edmundston (Region 4)	New Brunswick Department of Natural Resources and Energy Development 25 Guy Street Edmundston, NB E3V 3K5	Phone (506) 735-2040 Fax (506) 735-2042
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FISHERIES AND OCEANS CANADA (DFO)

Gulf Region	Fish and Fish Habitat Protection Program Fisheries and Oceans Canada 343 University Avenue Moncton, NB E1C 9B6	Phone (506) 851-6082 Email gulfhabitatgolfe@dfo-mpo.gc.ca
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