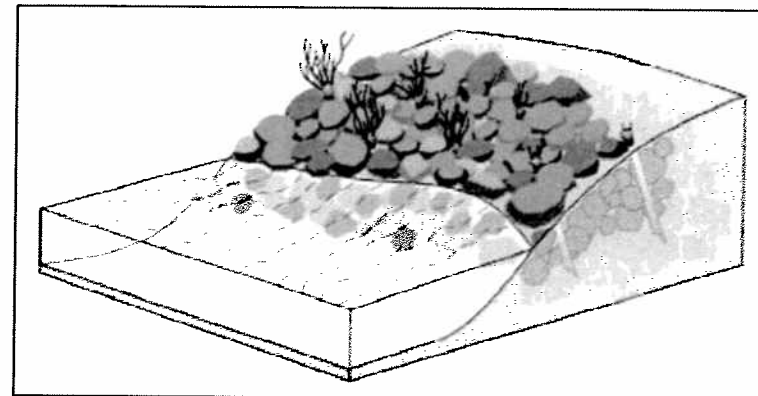
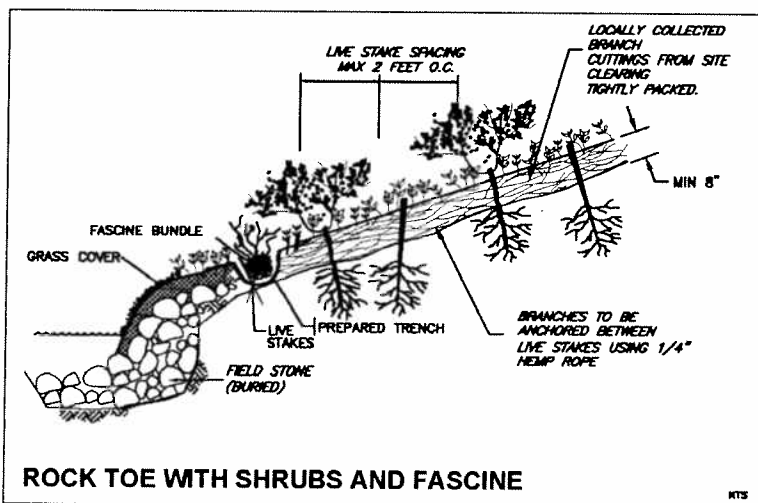


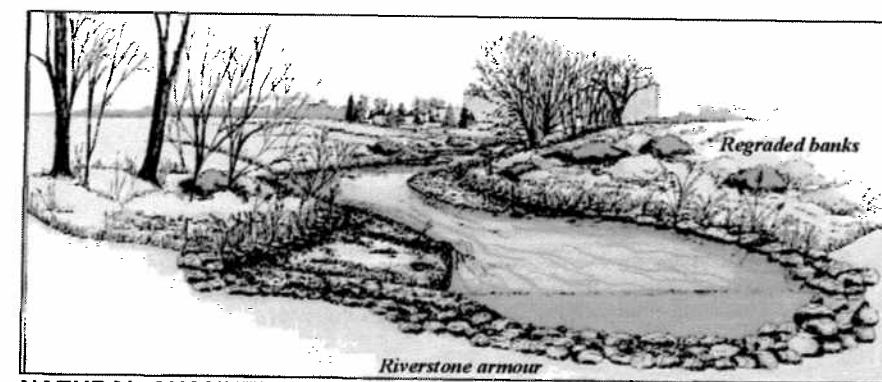
ROCK TOE PROTECTION AND FASCINES



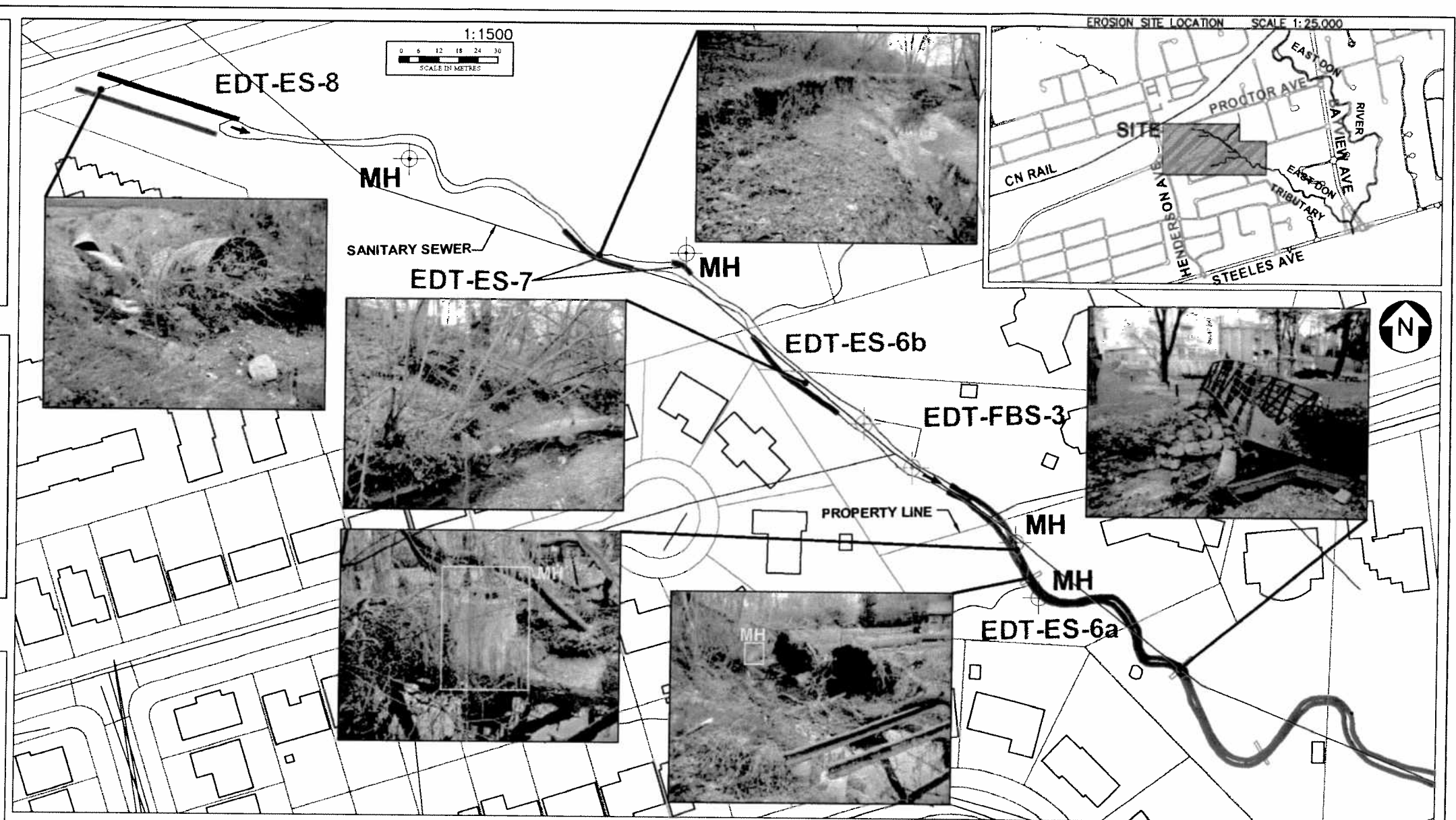
ROCK TOE PROTECTION (WITH JOINT PLANTINGS)



ROCK TOE WITH SHRUBS AND FASCINE



NATURAL CHANNEL (POOL)



CONCEPTUAL RESTORATION

1. SLOPE STABILIZATION BY REGRADING OR TOE PROTECTION AND BACKFILL
2. STABILIZE SLOPES
 - 2.1. REGRADE AND VEGETATE BANKS
 - 2.2. PROTECT BANKS WITH ROCK TOE AND PLANTINGS
 - 2.3. BURY ROCK TOE PROTECTION
3. SOFTEN EXISTING STREAMBANKS WHERE POSSIBLE
4. VARIABLE MEASURES TO BE USED TO ADDRESS VARIOUS EROSION CONCERNS
5. PROTECT MANHOLES
6. POTENTIAL TO WIDEN CHANNEL (WHERE CONFINED) AND TO INSTATE NATURAL FORM
7. ENHANCE TREE COVER AND VEGETATED BANKS
8. GEOTECHNICAL INVESTIGATION MAY BE REQUIRED TO ASSESS BANK STABILITY
9. MINIMIZE THE CHANNEL'S TENDENCY TO DOWNCUT
10. OPPORTUNITY IS PROVIDED TO EXAMINE NEARBY FISH BARRIER AND RETROFIT OR REMOVE, IF REQUIRED

LEGEND

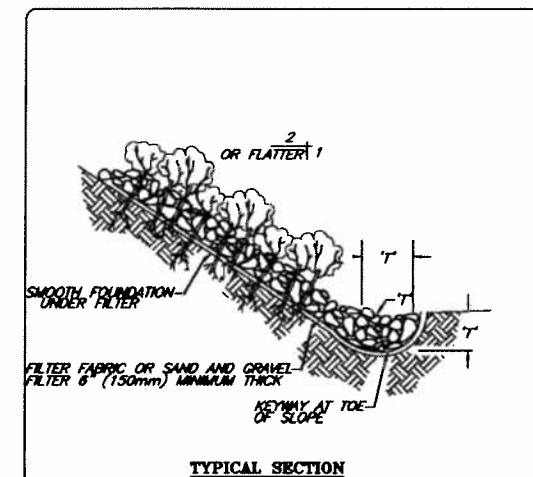
- PRIORITY EROSION SITE
- PRIORITY EROSION SITE NUMBER
- EROSION (NON PRIORITY)
- ARMOURSTONE BANKS
- STORMWATER OUTFALL
- FISH BARRIER
- SANITARY SEWER MANHOLE
- BUILDING

TOWN OF MARKHAM

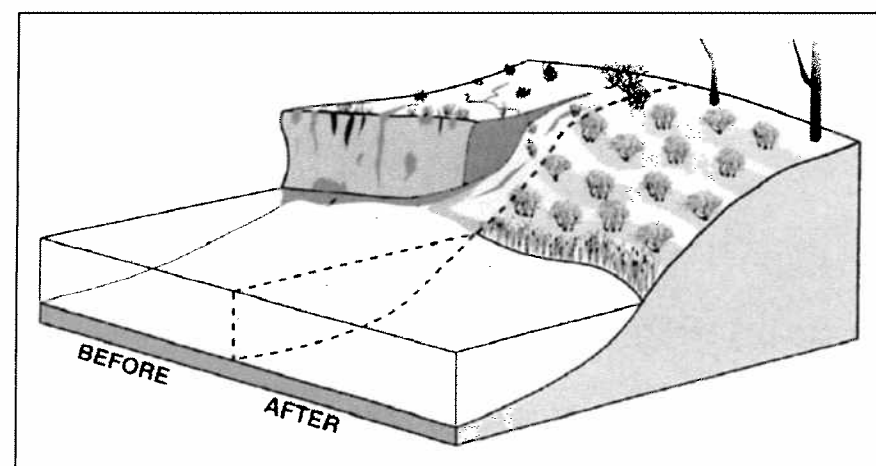
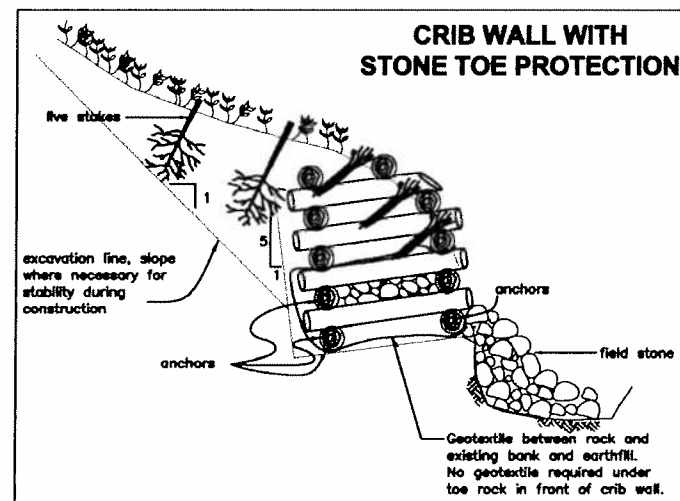
PROJECT: TOWN OF MARKHAM
EROSION RESTORATION
IMPLEMENTATION PLAN



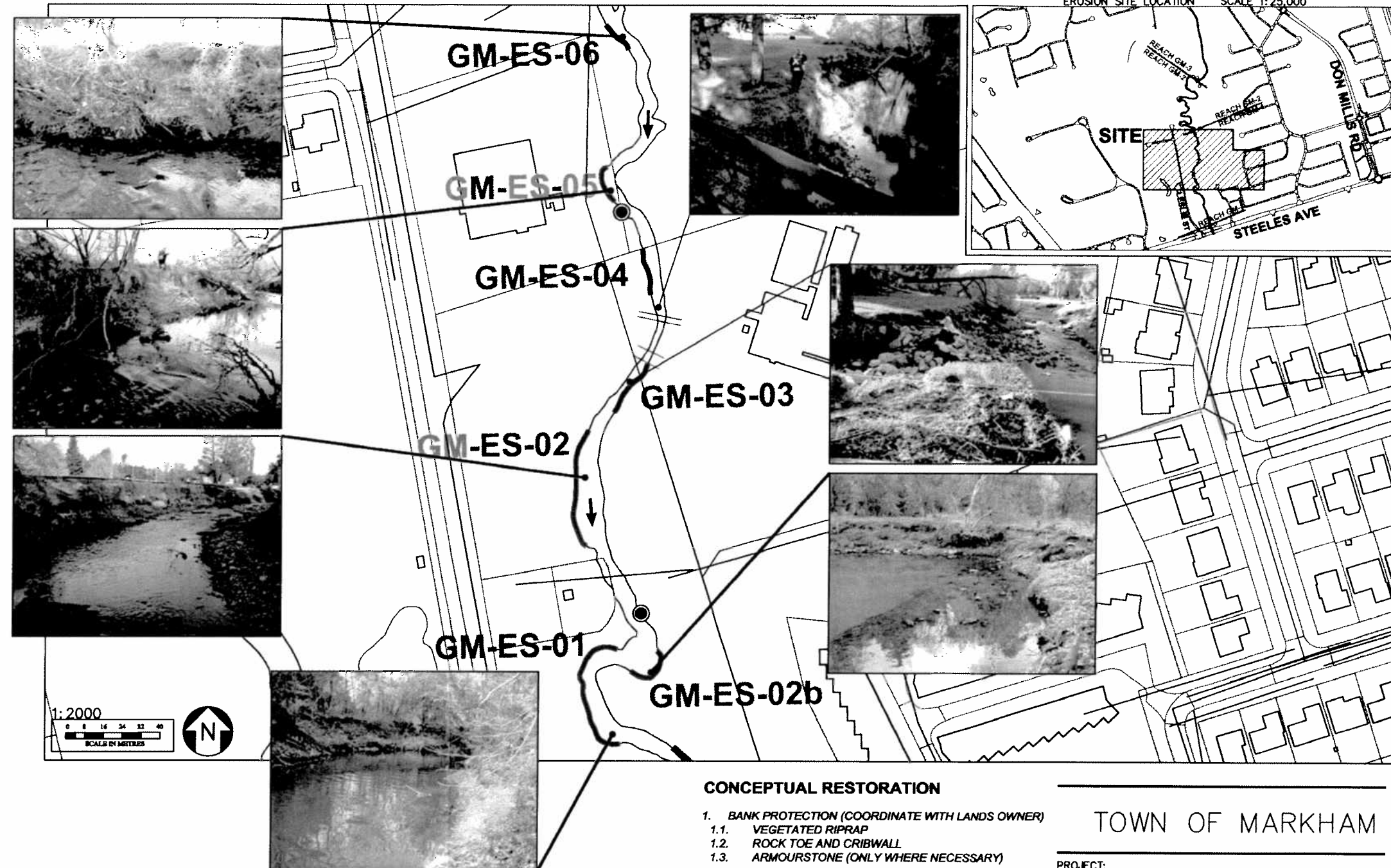
WATERCOURSE: East Don River Trib
REACH: ED-T FIGURE: 1
AQUAFOR PROJECT NO.: 64550



**VEGETATED
RIPRAP**



BANK SHAPING AND PLANTING

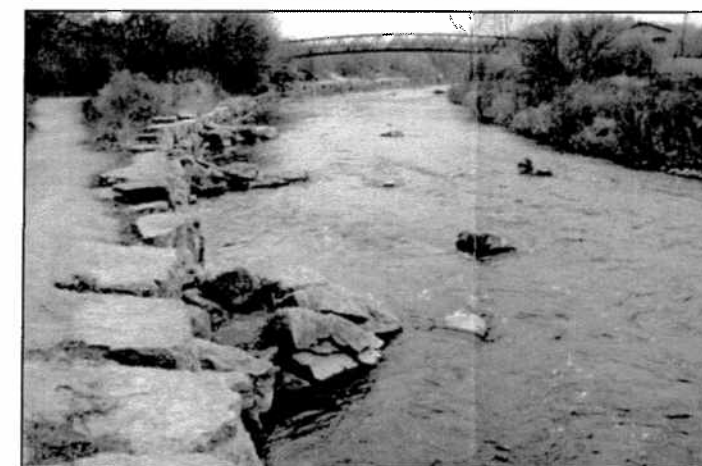


CONCEPTUAL RESTORATION

1. **BANK PROTECTION (COORDINATE WITH LANDS OWNER)**
 - 1.1. **VEGETATED RIPRAP**
 - 1.2. **ROCK TOE AND CRIBWALL**
 - 1.3. **ARMOURSTONE (ONLY WHERE NECESSARY)**
2. **BANK SHAVING AND PLANTING, WITH POTENTIAL ROCK TOE PROTECTION (E.G. AT GM-ES-04)**
3. **SEEK TO MINIMIZE BANK HARDENING**
4. **MINIMIZE INTERFERENCE WITH NATURAL CHANNEL PROCESSES**
5. **CONSIDER FLOW DEFLECTORS AT GM-ES-02 TO MINIMIZE HARDENING OF BANK OR CONSIDER RELOCATION OF CHANNEL**

LEGEND

- PRIORITY EROSION SITE**
- R-ES-16** **PRIORITY EROSION SITE NUMBER**
- EROSION (NON PRIORITY)**
- STORMWATER OUTFALL**
- BUILDING**



ROCK DEFLECTORS (e.g. Credit River)

TOWN OF MARKHAM

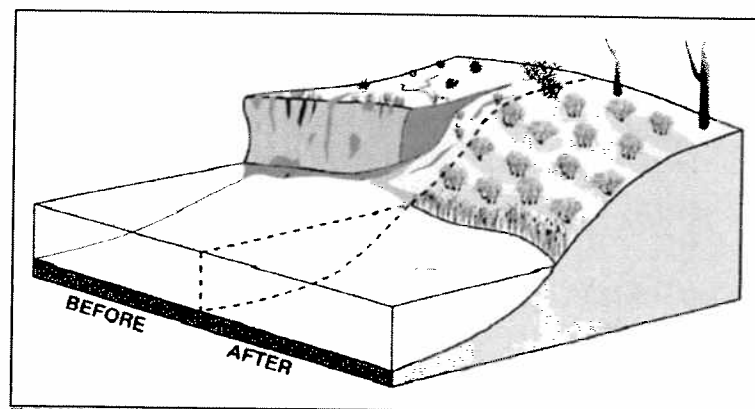
PROJECT: **TOWN OF MARKHAM
EROSION RESTORATION
IMPLEMENTATION PLAN**



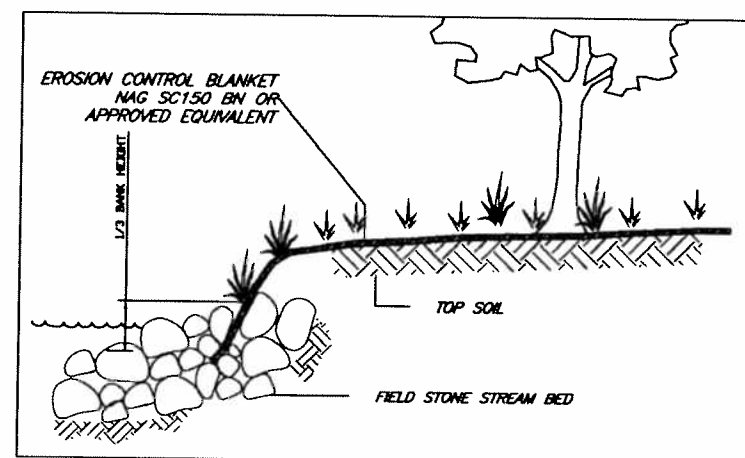
WATERCOURSE: German Mills Creek

REACH: GM-1 FIGURE: 2

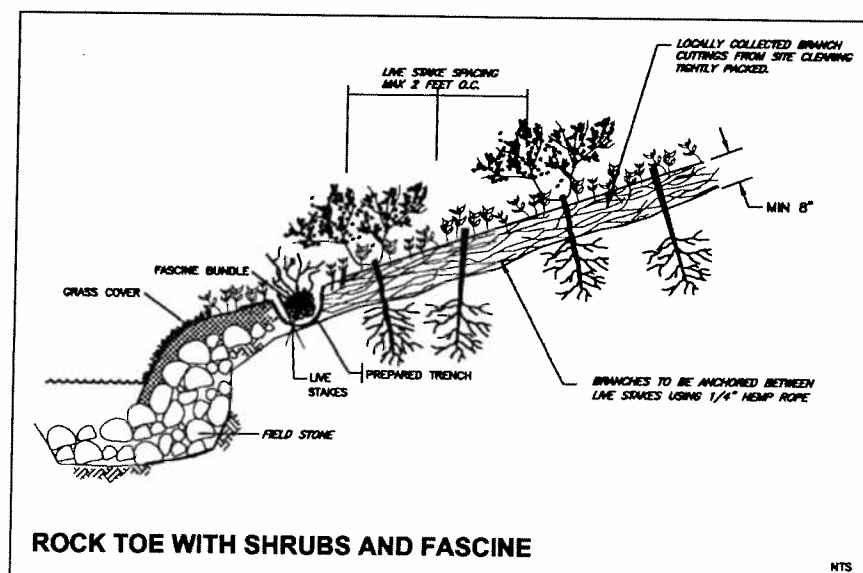
AQUAFOR PROJECT NO.: 64550



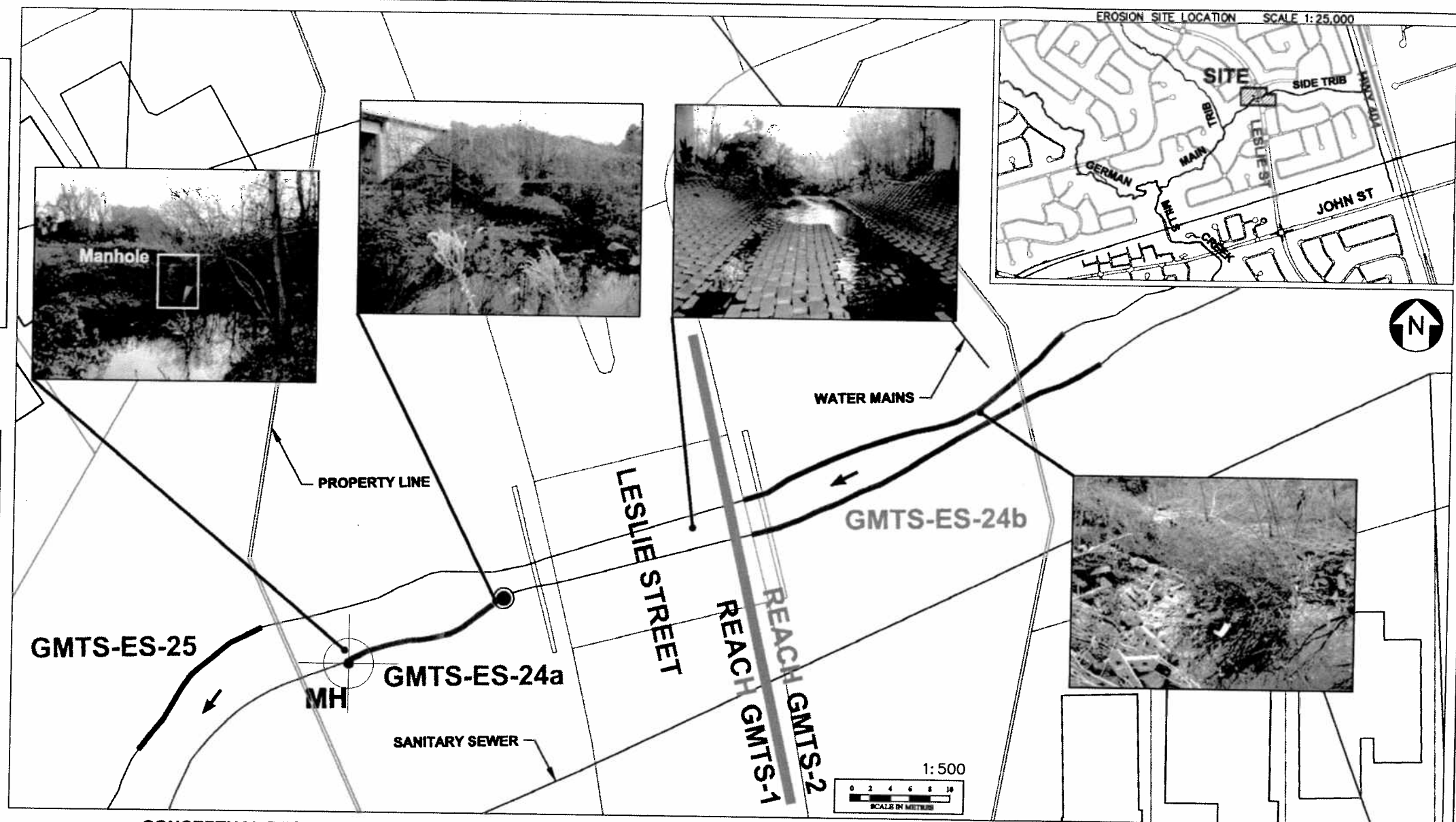
BANK SHAPING AND PLANTING



STONE TOE AND VEGETATION COVER



ROCK TOE WITH SHRUBS AND FASCINE



CONCEPTUAL RESTORATION
Upstream of Leslie Street

1. EXPLORE OPPORTUNITY TO REMOVE GEOGRID AND REINSTATE NATURAL CHANNEL FORM
2. REVEGETATION OF RESTORATION AREA SHOULD CONSIDER EXISTING WETLAND FEATURES IN FLOODPLAIN
3. ENHANCE RIPARIAN VEGETATION WITH TREES WHEREVER POSSIBLE (TO PROVIDE SHADE)
4. RESTORATION OF THIS SITE WILL PROVIDE AN OPPORTUNITY TO REMOVE GARBAGE AND DEBRIS FARTHER UPSTREAM (E.G. REFRIGERATOR)

Downstream of Leslie Street

1. PROVIDE ADDITIONAL PROTECTION FOR MANHOLE
2. IMPROVE ALIGNMENT OF OUTFALL CHANNEL
3. STABILIZE BANKS
 - 3.1. REGRADE AND VEGETATE
 - 3.2. ROCK TOE PROTECTION ONLY IF REQUIRED
4. ENHANCE RIPARIAN VEGETATION WITH TREES WHEREVER POSSIBLE

LEGEND

- PRIORITY EROSION SITE
- PRIORITY EROSION SITE NUMBER
- EROSION (NON PRIORITY)
- STORMWATER OUTFALL
- SANITARY SEWER MANHOLE
- BUILDING



NATURAL CHANNEL (RUN)

TOWN OF MARKHAM

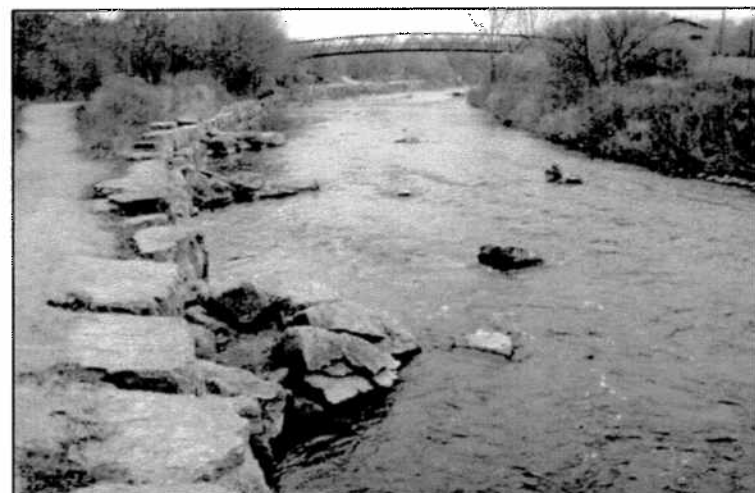
PROJECT: **TOWN OF MARKHAM
EROSION RESTORATION
IMPLEMENTATION PLAN**



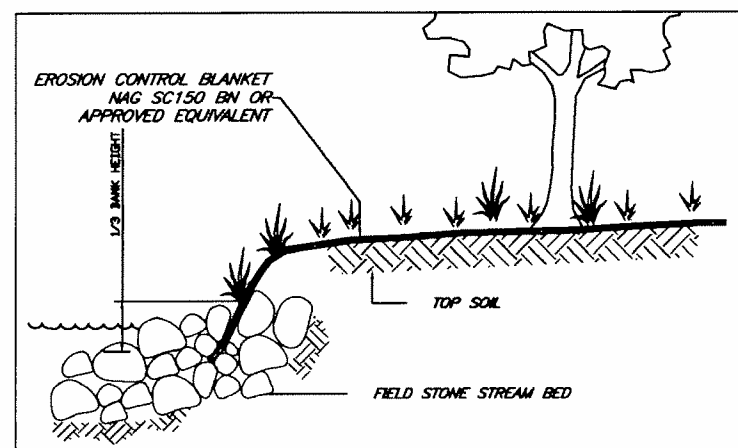
WATERCOURSE: German Mills Creek

REACH: GMTS-2 FIGURE: 3

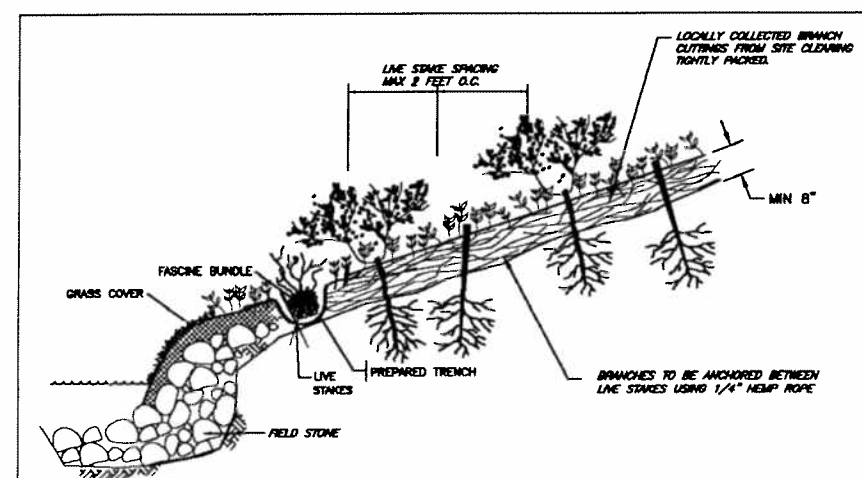
AQUAFOR PROJECT NO.: 64550



ROCK DEFLECTORS (e.g. Credit River)



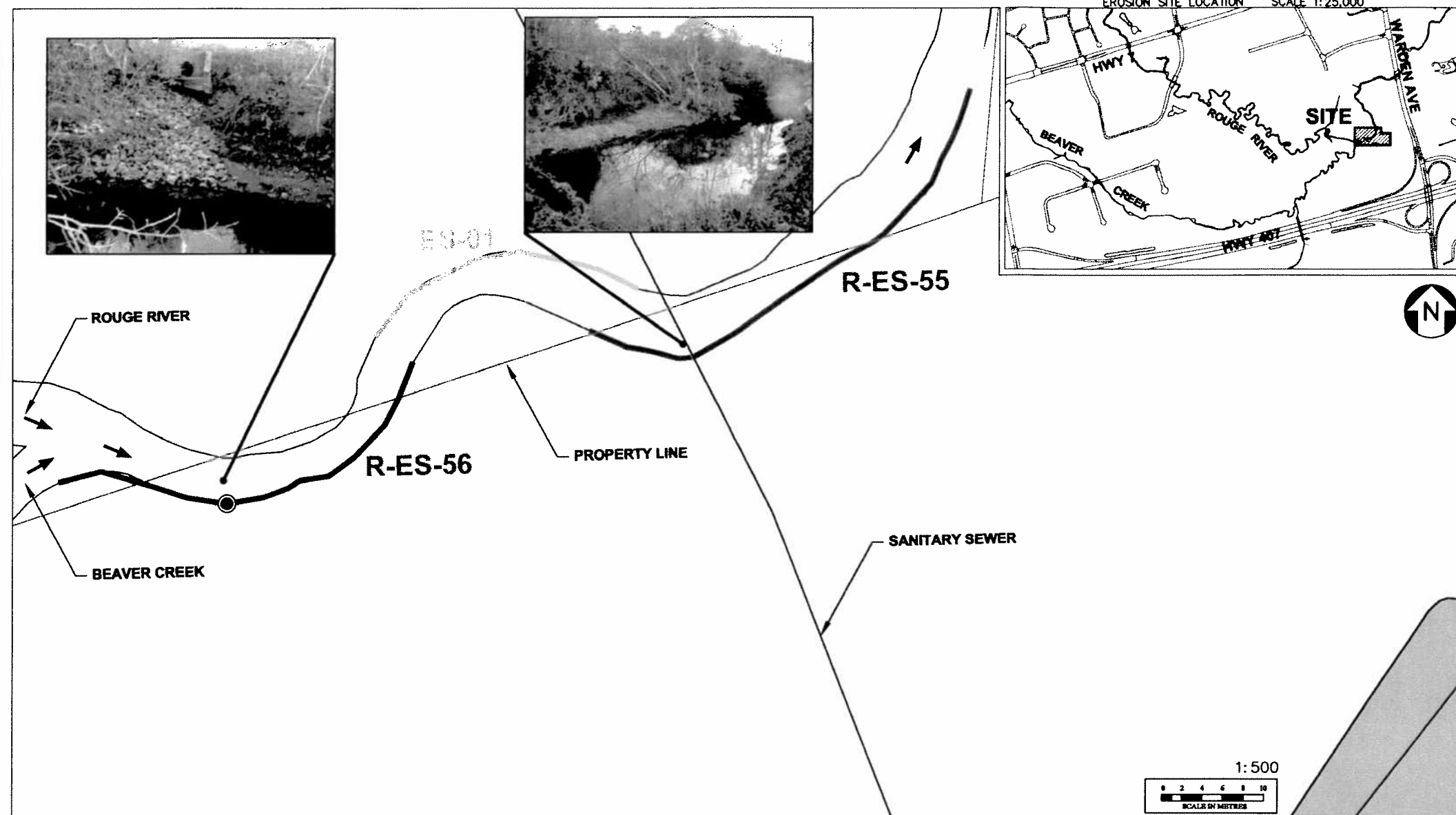
STONE TOE AND VEGETATION COVER



ROCK TOE WITH SHRUBS AND FASCINE



VEGETATED GEOGRID



CONCEPTUAL RESTORATION

1. STABILIZE SLOPE ANGLE AND REVEGETATE WITH TREES AND SHRUBS AT TOE.
2. PROTECT BANK TOE
 - 2.1. POTENTIAL FOR ROCK (OR FIELDSTONE) TOE OR CONSIDER AGGRESSIVE VEGETATION
 - 2.2. CONSIDER BURYING ROCKY TOE LENS AND PROVIDING VEGETATION AT BANK TOE
 - 2.3. POTENTIAL FOR FLOW DEFLECTION AWAY FROM BANK TOE
3. TREATMENTS TO CONSIDER ACTIVE CHANNEL PROCESSES (E.G. ENCOURAGE SEDIMENT TRANSPORT)

LEGEND

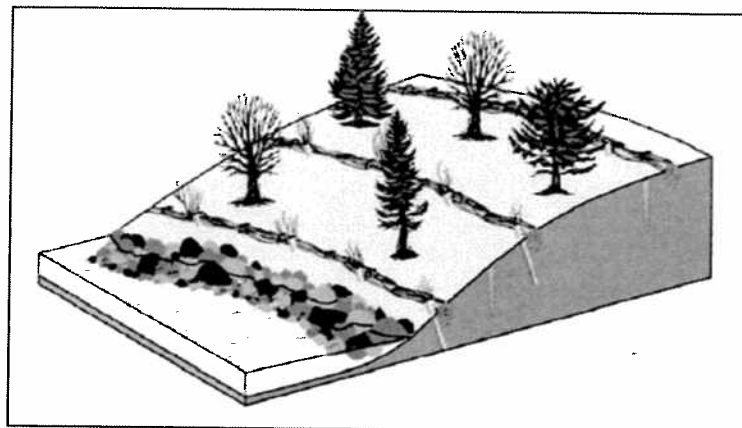
- PRIORITY EROSION SITE
- R-ES-16 PRIORITY EROSION SITE NUMBER
- ES-01 EROSION (NON PRIORITY)
- STORMWATER OUTFALL
- BUILDING

TOWN OF MARKHAM

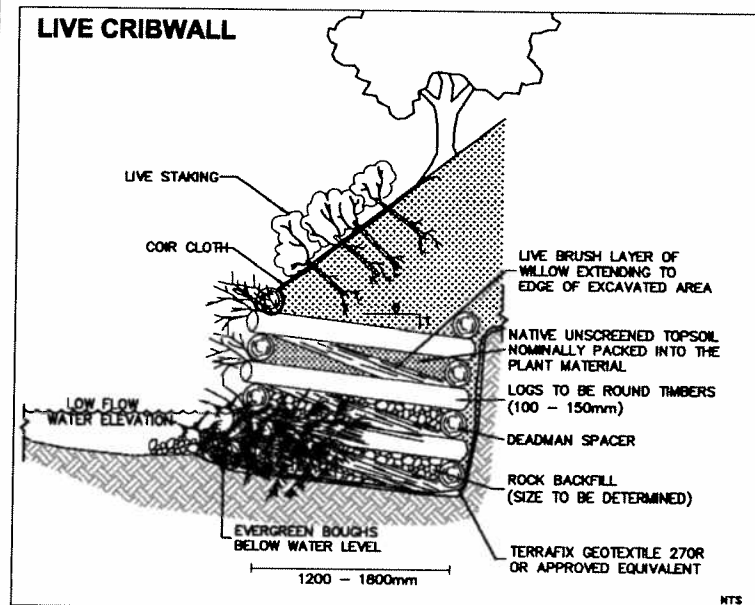
PROJECT: TOWN OF MARKHAM EROSION RESTORATION IMPLEMENTATION PLAN



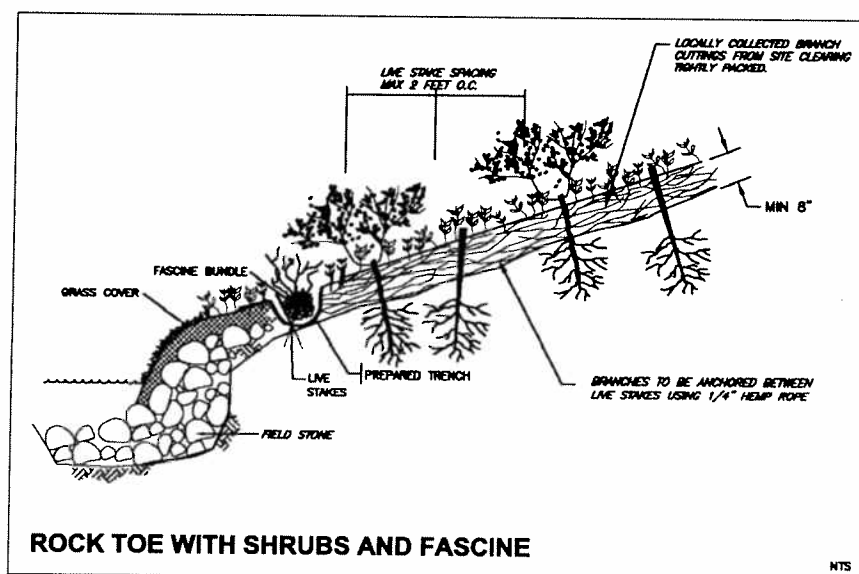
WATERCOURSE: Rouge River
 REACH: R-8 FIGURE: 4
 AQUAFOR PROJECT NO.: 64550



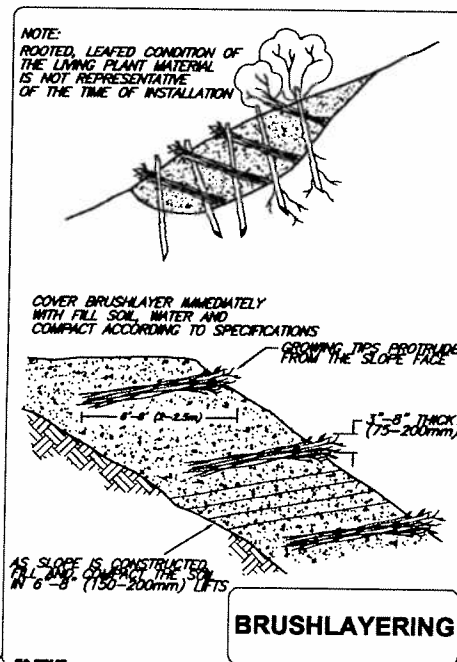
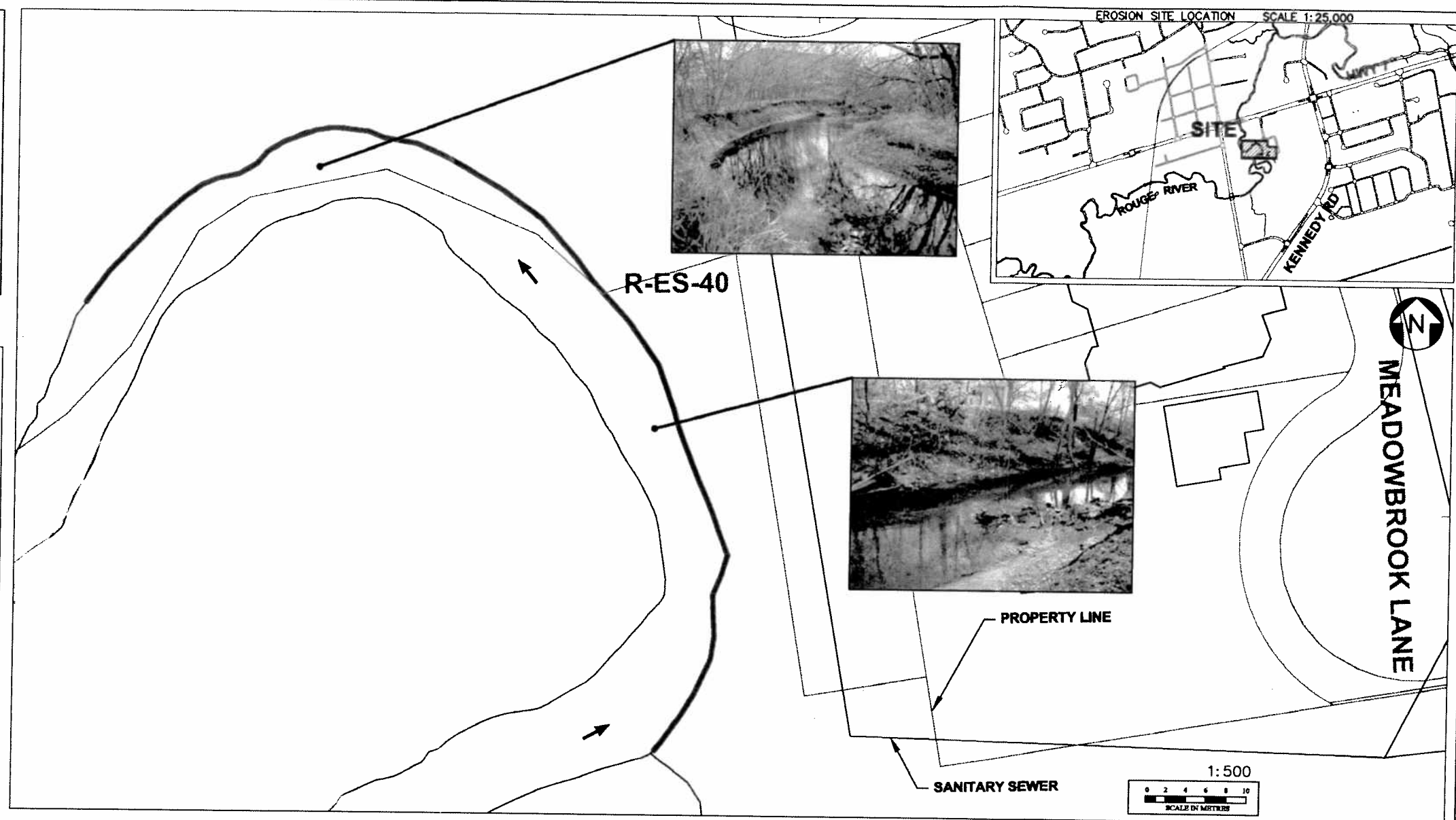
ROCK TOE PROTECTION AND FASCINES



LIVE CRIBWALL



ROCK TOE WITH SHRUBS AND FASCINE



BRUSHLAYERING

CONCEPTUAL RESTORATION

1. PROTECT BANK TOE
 - 1.1. ROCK TOE (FIELD STONE)
 - 1.2. BURIED ROCK TOE
 - 1.3. AGGRESSIVE VEGETATION
2. STABILIZE AND REVEGETATE BANK FACE (POTENTIAL TO REFILL BANK AND BIOENGINEER SLOPE)
 - 2.1. BRUSH LAYERING
 - 2.2. FASCINES
 - 2.3. VEGETATED CRIBWALL
 - 2.4. ENHANCE TREE COVER WHEREVER POSSIBLE
3. TREATMENTS SHOULD MINIMIZE INTERFERENCE WITH NATURAL CHANNEL PROCESSES (E.G. MAINTAIN SEDIMENT TRANSPORT)
4. GEOTECHNICAL ANALYSIS MAY BE REQUIRED

LEGEND

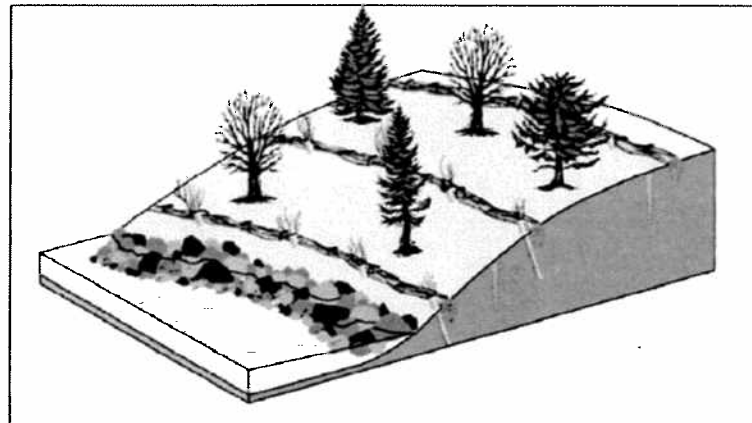
- PRIORITY EROSION SITE
- R-ES-16 PRIORITY EROSION SITE NUMBER
- EROSION (NON PRIORITY)
- BUILDING

TOWN OF MARKHAM

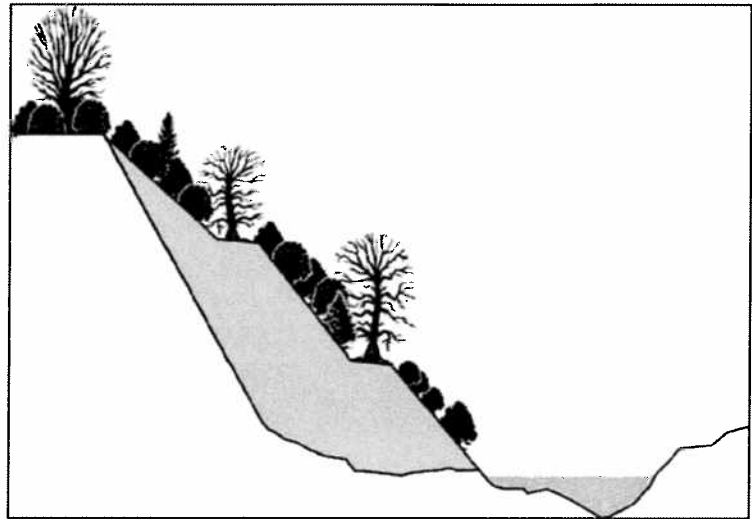
**PROJECT: TOWN OF MARKHAM
EROSION RESTORATION
IMPLEMENTATION PLAN**



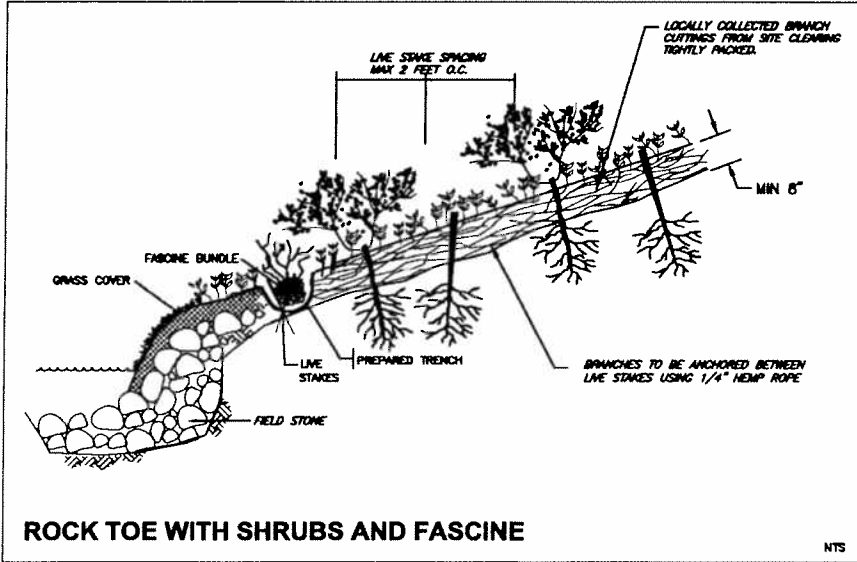
WATERCOURSE: Rouge River
 REACH: R-8 FIGURE: 5
 AQUAFOR PROJECT NO.: 64550



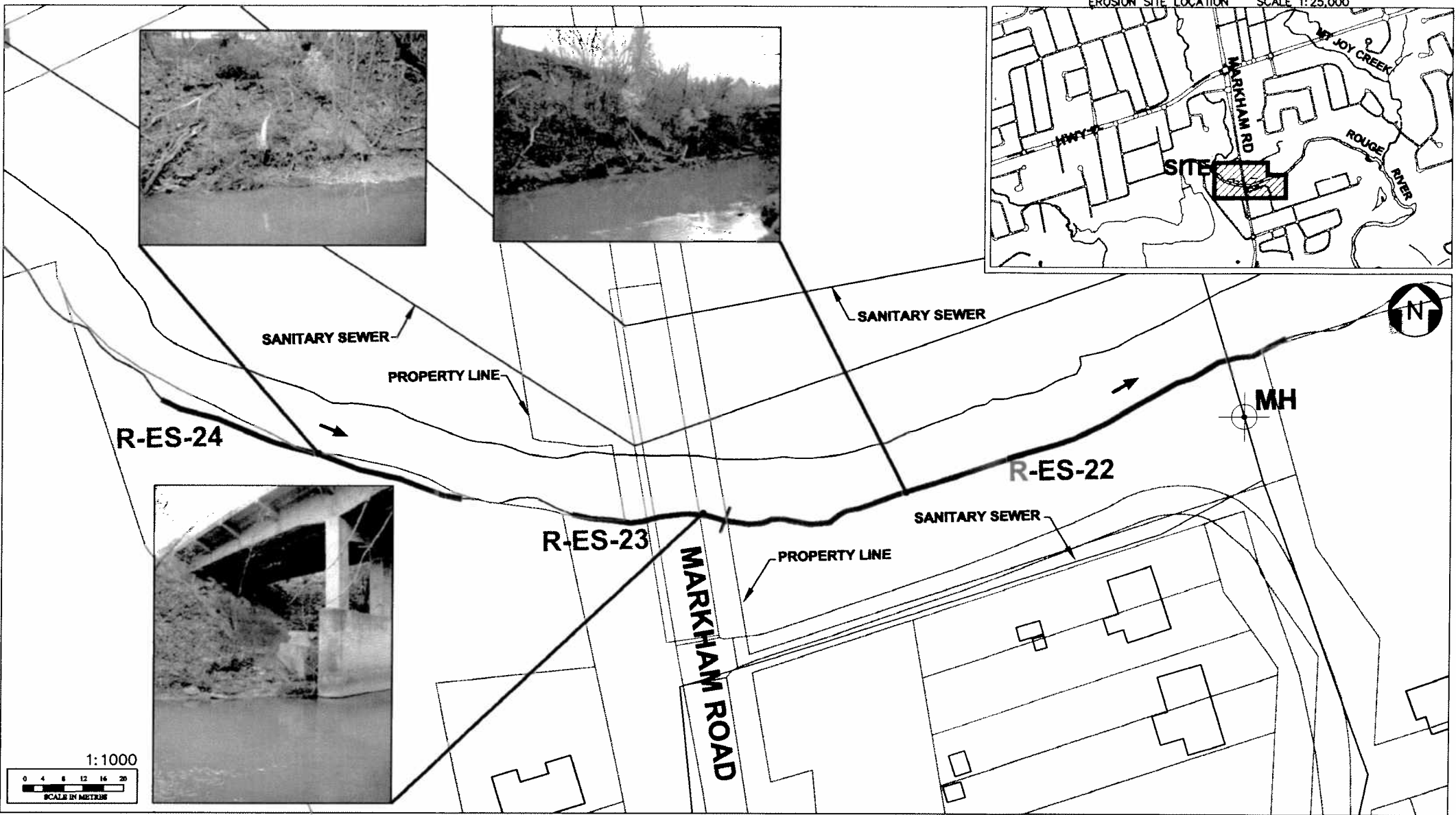
ROCK TOE PROTECTION AND FASCINES



REGRADED SLOPE WITH TREES



ROCK TOE WITH SHRUBS AND FASCINE



CONCEPTUAL RESTORATION

1. BANK TOE PROTECTION TO REDUCE HYDRATION AND WASHING (R-ES-22 AND R-ES-23 ONLY)
 - 1.1. BURIED ROCK TOE
 - 1.2. ROCK TOE
 - 1.3. POSSIBILITY OF REVEGETATING SLOPE ABOVE TOE PROTECTION
2. STABILIZE SLOPE FACE
 - 2.1. REGRADE SLOPE (WOULD RESULT IN LOSS OF VEGETATION)
 - 2.2. SLOPE FILL AND AGGRESSIVE VEGETATION
 - 2.3. REPLANT WITH TREES
 - 2.4. PLANT SHRUBS NEAR SLOPE TOE AND UPPER BANK
3. MINIMIZE INTERFERENCE WITH CHANNEL PROCESSES (E.G. SEDIMENT TRANSPORT)
4. GEOTECHNICAL INVESTIGATION RECOMMENDED

LEGEND

- PRIORITY EROSION SITE
- R-ES-16 PRIORITY EROSION SITE NUMBER
- EROSION (NON PRIORITY)
- SANITARY SEWER MANHOLE
- BUILDING


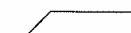


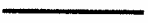


TOWN OF MARKHAM

PROJECT: TOWN OF MARKHAM
EROSION RESTORATION
IMPLEMENTATION PLAN



WATERCOURSE: Rouge River
REACH: R-4 FIGURE: 6
AQUAFOR PROJECT NO.: 64550

LEGEND

-  Priority Erosion Site
-  Creek Abbreviation
-  Erosion Site Number
-  Study Area
-  Watercourse
-  Road
-  Railway

0 400 800 1200 1600 2000
SCALE IN METRES

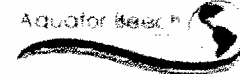
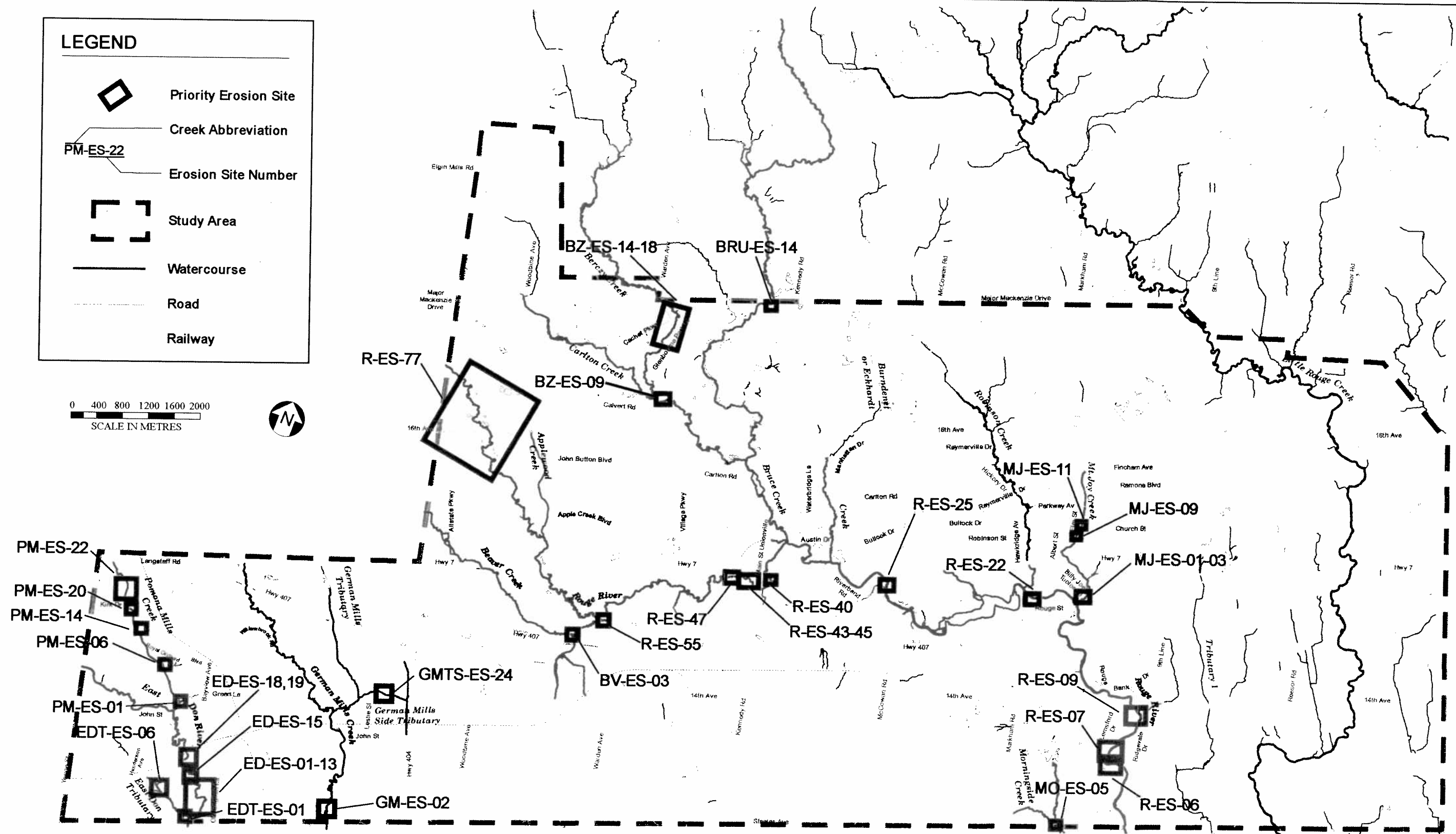


FIGURE 10.1

TITLE: THIRTY PRIORITY EROSION SITES

Table 10.2 Recommended Implementation Plan. (Category A = public infrastructure, Category B = private damage, Category C = erosion not related to urbanization. For further explanation of information contained within this table, please see Chapter 10.4 of this report). ¹ Note: Bolded/underlined numbers refer to priority erosion sites; adjacent, non-priority erosion sites were listed if their coincident restoration was considered feasible.

PROJECT CATEGOR Y	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (Incl 15% contingency)	FIGURE (APPENDIX E)
Short Term – 1 to 4 years											
B	R-ES- <u>55</u> , 56	R-8	Rouge River - upstream of Warden Avenue	-protect sanitary sewer from erosion -minimize damage to slope to protection	-regrade and vegetate valley wall slope -rock toe protection (buried if possible) -potential flow deflection	-reduce risk to parking lot -reduce risk to sanitary sewer	4	B	Markham TRCA	345,000	29
B	GM-ES- 01, <u>02</u> , 02b, 03, 04, 05, 06	GM-1	German Mills Creek -upstream of Steeles Avenue	-protect parking lot from erosion -stabilize channel banks	-slope toe protection adjacent to parking lot -revegetation of bank faces	-reduce risk to private property -reduce sediment loading -enhance terrestrial and aquatic habitat -stabilize channel form	1	B	DFO, TRCA, Markham	520,000	10
B	EDT-ES- <u>06a, 06b</u> , 07, 08	ED-T	East Don River Tributary -downstream of Proctor Avenue	-protect private property -protect subsurface infrastructure	-move manholes away from/out of creek if possible -increase channel capacity where constricted -restore channel banks -replace crossing with channel spanning structure	-opportunity to address potential fish barrier -enhance channel function and form -reduce risk to subsurface infrastructure and manholes	3	B	Markham TRCA DFO Region	725,000	9
A	R-ES- <u>22</u> , 23, 24	4	Rouge River -upstream and downstream of Markham Road	-protect private property -protect Markham Road footings -protect subsurface infrastructure	-protect bank toe by burial of rock toe protection and vegetation -fill slope, grade, and vegetate -move manhole if possible	-reduce hydration of slope toe materials -reduce risk to property	4	B	Markham TRCA	225,000	24
A	GMTS- ES- <u>24a</u> , <u>24b</u> & 25	Side tributar y	German Mills Creek - upstream and downstream of Leslie Street	-protect manhole -remove/repair/replace existing geogrid and restore natural channel form and function -stabilize channel banks -remove garbage -repair stormwater outfall	<i>Upstream of Leslie St.:</i> -riparian enhancement -natural channel design -garbage removal <i>Downstream of Leslie St.</i> -regrade banks and vegetate -move manhole away from creek	-reduce potential for breakage of pipe -reduce potential for undermining Leslie Street -remove any fish barrier improve aquatic habitat -enhance channel function -reduce sediment loading	1	B	DFO, TRCA, Markham	175,000	11
A	R-ES- <u>40</u>	RR-8	Rouge River -upstream of Hwy 7	-protect private property -protect sanitary sewer	-bank toe protection -stabilization of bank face with vegetation	-reduce sediment loading to channel -reduced risk of public health and safety	4	B	Markham TRCA	190,000	26
A	MJ-ES- <u>10</u>	MJ-4	Mount Joy Creek -downstream of Church St.	-protect subsurface infrastructure -stabilize banks -potential to undertake maintenance of nearby gabion bank protection	-remove/relocate manhole out of creek if possible -consider replacement of gabions with softer approach, if protection is required -stabilize banks through vegetative plantings and regrading as necessary	-adjustment of cross-sectional capacity -maintain bank protection but at increased benefit to aquatic and terrestrial habitat	4	B	Markham TRCA DFO Region	265,000	14
A	R-ES- <u>47a, 47b</u>	R-8	Rouge River -upstream of Warden Ave, below Beaver/Rouge confluence	-remove undersized private crossing -protect subsurface infrastructure and manhole	-relocate manhole away from creek -remove concrete debris from channel -repair outfall structure	-remove flow constriction -reinstate natural channel form -protect private property -enhance terrestrial and aquatic habitat through riparian vegetation	4	B	Markham TRCA DFO Region	420,000	28

PROJECT CATEGOR Y	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (incl 15% contingency)	FIGURE (APPENDIX E)
					-enhance riparian vegetation to stabilize banks						
A	MJ-ES-01, <u>02a</u> , <u>02b</u>	MJ-1	Mount Joy Creek -upstream and downstream of Tuclor Lane	-mitigate fish barrier -protect subsurface infrastructure -protect crossing -stabilize channel banks	-remove/relocate manhole from creek -assess potential fish barrier and mitigate to enable fish passage -modify crossing structure to reduce erosive shear on downstream channel banks and stormwater outlet pipe that is in wingwall -stabilize banks through use of bioengineering treatments -enhance riparian vegetation with trees and shrubs	-reduced risk to subsurface infrastructure -enhancement of riparian zone which benefits terrestrial and aquatic habitat	4	B	Region Markham TRCA DFO	300,000	13
A	MJ-ES-11, <u>12</u>	MJ-5	Mount Joy Creek -upstream of Church St.	-reduce risk to sanitary sewer and manhole	-remove/relocate manhole from creek -enhance riparian vegetation to stabilize banks -stabilize banks through planting on bank face and regrade only if necessary	-reduce risk to subsurface infrastructure -enhance terrestrial and aquatic habitat through riparian plantings	4	B	DFO Markham Region TRCA	195,000	15
A	PM-ES- <u>20</u> , <u>21</u>	PM-7	Pomona Mills Creek -upstream of Kirk Dr.	-protect private property from erosion -protect subsurface infrastructure improve natural channel form	-create flooding relief for more frequent flows – e.g., two tier channel if possible through regarding -enhance riparian plantings to promote stability to bank face and bank top -slope toe protection should consider bioengineering (e.g., fascines), rock toe if necessary should be naturalized (e.g., vegetated rip-rap), -removal of weir should consider existing base level controls exerted by weir, and maintenance of natural channel form	-reduce risk to private property -improve aquatic habitat through removal of weir -re-instate natural channel form -enhancement of terrestrial and aquatic habitat through riparian plantings	1	B	DFO Markham TRCA	320,000	19

Intermediate Term – Years 4 to 7

B	R-ES- <u>77</u>	R-12	Rouge River -in Markham Golf Club, between Woodbine Avenue and Hwy 404	-stabilize channel banks -replace/modify existing bank protections (gabion, rip-rap)	-establish riparian zone along channel banks -plant bank faces -ensure all channel crossings have sufficient span -replace/enhance existing rip-rap protection with softer approach (e.g., use fascines or	-reduce sediment loading into watercourse -stabilize/naturalize channel form	4	B	Markham TRCA	1,900,000	30
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PROJECT CATEGORY	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (incl 15% contingency)	FIGURE (APPENDIX E)
					incorporate joint plantings)						
A	PM-ES- <u>06</u>	PM-4	Pomona Mills Creek -upstream of John St., northern limit of Ladies Golf Course	-remove obstruction to flow and aquatic habitat -protect subsurface infrastructure -restore natural channel form and function	-remove concrete fence post footings out of creek -move end of fence to a distance away from edge of bank -protection of subsurface infrastructure may require structure in creek to protect invert -consider mitigation of downstream fish barrier by modifying/removing weir, and replacement of low-level concrete crossing with bridge	-remove existing structures from creek that interfere with natural processes -protect subsurface infrastructure. -restore channel form	1	B	DFO, TRCA Markham	242,000	17
A	ED-ES- <u>05</u> , 06, 07, 08, 09, 12	ED-1	East Don River -between Steeles Ave. and Bayview Ave	-examine potential fish barrier -protect private property from bank erosion -repair outfall and protect storm sewer	-Remove/repair/replace existing bank toe protection -Set stormwater outfall back from channel -Remove bridge crossing (Site ES-06) and replace only if necessary with a sufficiently wide span -Stabilize slopes (regrade or fill banks; bioengineer slope toe, bury rock toe protection if needed.	-removal of concrete debris from channel -enhancement of riparian zone with benefit to terrestrial and aquatic habitat -remove flow constriction -enhancement of fish passage -reduce interference with natural channel form (i.e., storm sewer outfall)	3	B	Markham TRCA DFO	1,270,000	5
B	ED – ES- <u>18</u>	ED-1	East Don River -downstream of CN track	-protect subsurface infrastructure -protect private property	-consider relocating manhole and sanitary sewer -stabilize valley wall toe by regarding/filling and grading/bury rock toe protection -repair existing bank toe protection only as necessary	-reduce risk to private property -reduce risk to sanitary sewer -enhance terrestrial habitat on slope	3	B	Markham TRCA DFO Region	240,000	7
B	PM-ES- <u>22</u>	PM-7	Pomona Mills Creek -in Holy Cross Cemetery	-stabilize banks to protect graves -enhance corridor function -replace gabion with other structures	-Increase capacity of higher frequency flows through multi-stage channel if possible -regrade banks to a more stable configuration and vegetate if possible -bank toe protection of stone and vegetation -create variability in bed morphology Enhance riparian vegetation with shrubs and trees where possible	-enhance flow conveyance -improve aquatic habitat -enhance terrestrial habitat through riparian plantings protection of grave sites from erosion	1	B	Markham TRCA DFO	470,000	20
A	ED-ES-14, <u>15</u>	ED-1	East Don River -upstream of Bayview Ave.	-repair stormwater outfall -protect sanitary sewer - relocate sanitary sewer and	-stabilize banks where risk occurs by regrading slope, vegetation	-reduce sediment loading to watercourse -reduce risk to manhole and sanitary sewer	3	B	Markham TRCA	220,000	6

Table 10.2

PROJECT CATEGORY	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (incl 15% contingency)	FIGURE (APPENDIX E)
				manhole away from river if possible -move outfall further back from creek	-bury rock toe protection if required						
A	EDT-ES-01,02	EDT	East Don River Tributary -upstream of Bayview Ave.	-protect road -reduce erosion of private property	-remove gabion where not necessary -replace gabion treatment with softer approach -replace/reinforce bridge to protect from failure	-enhance naturalized appearance of treatments -replace hard structures with softer approaches	3	B	Region? Markham TRCA DFO	445,000	8
A	BZ-ES-09, 10, 11	BZ-10	Berczy Creek -upstream and downstream of Warden Ave.	-protect road from channel erosion -reduce potential of valley wall failure -soften existing erosion protection works	-toe protection along valley wall – minimize hardening -potential realignment to be determined in conjunction with Warden Ave. widening -replace/modify existing erosion protection works	-reduce risk to road -protect trees on valley wall -protect private property -enhance natural appearance, restore natural channel form	5	B	Region Markham TRCA DFO	400,000	2
A	PM-ES-01	PM-1	Pomona Mills Creek -upstream of confluence with East Don River	-repair/replace/modify bridge crossing and associated berm. -mitigate erosion concerns	-study should be completed to determine if crossing structure can be replaced by a channel spanning bridge -consideration of current base level control influence must be taken in any restoration plans -address downstream erosion with use of bioengineering approaches (fascines) -remove fish barrier -enhance downstream natural channel functions, perhaps through incorporation of channel bed features to stabilize creek	-removal of fish barrier -enhancement of natural channel functions -removal of flow constriction -protection of public health and safety	1	B	Markham TRCA DFO	195,000	16
A	MO-ES-05	MO-1	Morningside Creek Tributary -upstream of Steeles Ave.	-protect Steeles Ave. from erosion	-repair erosion scar with filling and planting- bury rock toe protection where required -undertake minor realignment only if this reduces impact to Steeles Road	-reduce risk to road -stabilize watercourse -enhance riparian vegetation	5	B	Markham TRCA DFO	175,000	12
A	BV-ES-03	BV-4	Beaver Creek -upstream of confluence with Rouge River, parallel to Hwy 407	-remove/replace pipe that projects out of bank -stabilize banks to protect stormwater outfall	-increase bank stability by slight modifications -minimize risk to stormwater structure -enhance riparian vegetation	-enhance bank stability and terrestrial habitat through riparian vegetation -reduce risk to stormwater outfall -reduce sediment loading to stream	4	B	Markham TRCA	175,000	1
A	PM-ES-14	PM-6	Pomona Mills Creek -Baythorn-Brae Drive footpath	-remove channel constriction -protect public health and safety	-consider replacing existing crossing with channel spanning structure – identify implications for flow conveyance and base level	-enhance channel function -reduce erosive stress on banks through flood relief -reduce risk to public health and safety.	1	B	Markham TRCA DFO	460,000	18

Table 10.2

PROJECT CATEGORY	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (incl 15% contingency)	FIGURE (APPENDIX E)
					control -provide for multi-tier channel to enhance 'floodplain' access during more frequent (e.g., < 5 yr flows) -bank protection/stabilization should be based on bioengineering approaches and incorporate vegetation wherever possible (fascines, vegetated rip-rap) -enhance riparian plantings						
Long Term – Years 7 to 10											
B	R-ES-06	R-1	Rouge River -upstream of CN line	-protect slope from failure	-regrade slope to stable configuration and vegetate -incorporate buried rock near toe if necessary	-reduce risk to private property/golf course	4	B	Markham TRCA	395,000	21
B	R-ES-07	R-1	Rouge River -upstream of CN rail, adjacent to Rouge River Drive	-stabilize slope to protect private property	-regrade or refill banks -bury rock toe protection where necessary	-enhance slope stability -enhance riparian vegetation which provides terrestrial and aquatic benefits.	4	B	Markham TRCA	345,000	22
C	BZ-ES-14, 15, 16	BZ-9	Berczy Creek -downstream of Major Mackenzie Drive	-protect private property from erosion -restore channel connectivity and channel functions	-examine potential fish barrier -use bioengineering approaches to stabilize banks -move-pond offline if possible and repair erosion around dam	-reduce risk to private property -restore natural channel form -enhancement of riparian vegetation -enhance aquatic habitat	5	B	Markham TRCA DFO	645,000	3
B	R-ES-44	R-8	Rouge River - upstream of Main St. Unionville in Unionville Fairways Golf Course	-protect golf course property from erosion by enhancing bank protection	-use bioengineering approaches where possible -protect slope toe enhance riparian vegetation	-reduces rate of erosion -enhances terrestrial and aquatic habitat	4	B	Markham TRCA	675,000	27
B	R-ES-25, 26	RR-06	Rouge River -upstream of McCowan Road	-protect private property -minimize interference with natural channel processes	-remove crossing if possible, if replacement is necessary then ensure that span is sufficiently wide to minimize interference with flows. -address large woody debris only if this poses a risk to aquatic habitat -where slope stabilization is required, consider regrading and bioengineering approaches -enhance riparian vegetation	-remove flow constriction -enhance aquatic and terrestrial habitat through riparian plantings. -stabilize channel	4	B	Markham TRCA DFO	175,000	25
C	BRU-ES-13, 14	BRU-3	Bruce Creek -downstream of Major Mackenzie Drive	-reduce risk to road -protect subsurface infrastructure -minimize interference with natural channel form and	-consider moving manholes away from the creek -move fence out of creek -address erosion only where it poses a risk	-stabilization of channel banks -enhance terrestrial and aquatic habitat through riparian plantings	5	B	Markham TRCA Region DFO	195,000	4

Table 10.2

PROJECT CATEGOR Y	PROJECT NO. ¹	REACH	LOCATION	ACTION	MEASURE	BENEFITS	HABITAT SENSITIVITY CLASS	SCHEDULE A, B, C	APPROVALS REQUIRED	COSTS (\$) (Incl 15% contingency)	FIGURE (APPENDIX E)
				processes	-protect bank toe if necessary using soft approaches where feasible -consider instream works only where necessary -enhance riparian vegetation to promote bank stability						
B	R-ES-09	R-1	Rouge River -downstream of 14 th Ave.	-mitigate nearby fish barrier if necessary -protect private property through slope stabilization	-stabilize slope (fill erosion scars, bank toe protection, bioengineer toe) -instream works only where necessary (e.g., flow deflection)	-enhance fish passage through mitigating/removing potential fish barrier -reduce risk to private property -enhance terrestrial and aquatic habitat through riparian vegetation	4	B	Markham TRCA DFO	465,000	23
TOTAL Cost										12,767,000	