APPENDIX K
Implementation Table

Caledon Creek and Credit River Subwatershed Study
Phase III - Implementation

Prepared for:

Region of Peel
Town of Caledon

Prepared by:

Blackport Hydrogeologic
Credit Valley Conservation
Environmental Water Resources Group
Parish Geomorphic
Water Systems Analysts

December, 2001
Printed October, 2003

INTRODUCTION

Appendix K provides a summary of how to implement the recommendations of the Subwatershed 16 and 18 Study. The proposed approach for implementation has been categorized under the 5 headings:

- Planning and Policy
- Rehabilitation and Retrofit
- Stewardship and Education
- Monitoring
- Research and Development

Public safety, public health and resource issues have been summarized for each where applicable, and discussed under the headings of action, facilitator, related implementation mechanism, timeframe and cost.

DEFINITIONS

Facilitator - The agency/group that is responsible for taking the lead on implementing the action

Contributor - The agency/group that has the ability to offer assistance to the facilitator to implement the action

Related Implementation Mechanism - The policy, study or process that would best be used to implement the action

ACRONYM LIST

The following is a list of acronyms used in the table.

APPROX. – Approximately		**NE** - Niagara Escarpment
ASAP - As soon as possible		**NEC** - Niagara Escarpment Commission
CCME - Canadian Council for Ministers of the Environment		**OPs** - Official Plans
CFWIP - Community Fisheries and Wildlife Involvement Program		**OMAFRA** - Ontario Ministry of Agriculture, Food and Rural Affairs
CVC - Credit Valley Conservation		**OPA** - Official Plan Amendment
DFO - Department of Fisheries and Oceans		**P.** – Priority
EIR - Environmental Implementation Report		**REHAB** – Rehabilitation
EPA - Environmental Protection Act		**SQ** – Square
IMPL MECH - Related Implementation Mechanism		**U of G** - University of Guelph
MED - Medium		**WHPS** - Well Head Protection Strategy
MNR - Ministry of Natural Resources		**WRP** - Water Resources Association
MOE - Ministry of the Environment		**YR(S)** - Year(s)
N/A - Not available		

SUBWATERSHEDS 16 AND 18 - IMPLEMENTATION TABLE

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
A-Planning and Policy						
Surface Water Management Plan	Setbacks should be maintained for new development from all defined valley slopes, flood plains and watercourse channels	CVC	Town of Caledon, Region of Peel, NEC	CVC Regulations, Planning Act, OPs and NE Plan	Immediate	N/A
	Update the Valleyland Protection Policies to include geomorphic considerations.	CVC	Town of Caledon	Provincial Policy Statement – Natural Hazards	0-5 years	$500
	Stormwater Management – Quality Control for stormwater infiltration, to protect groundwater quality	Municipality	Developer	Plan of Subdivision and Wellhead Protection Strategy	At draft plan of subdivision and as part of the Wellhead Protection Strategy	$3000 - 6000 per site
	Implement planning and construction guidelines	Municipality, CVC	Private Developers	Planning Act, Municipal Act	0-5	N/A
	Continue application of DFO Act and Policy in plan input and review	CVC re: initial review and mitigation DFO re: authorization, compensation and enforcement	MNR re: enforcement of deleterious substances including sediment	Federal Fisheries Act	Ongoing	$10 000 per year for entire CVC watershed – approx. $600 per year for subs 16 and 18
	Voluntary compliance, where aggregate licenses already exist, to meet the recommendations of the subwatershed study (e.g. maintain barriers between below water table excavations so that changes to hydraulic heads are minimized).	Town of Caledon	Region of Peel, CVC, MNR Aggregate Producers	Voluntary	0-5 years	varied

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
Groundwater Management Plan	Development of a Wellhead Protection Strategy (WHPS) to protect water quality in Capture Zones for each municipal well.	Region of Peel	Town of Caledon	Stormwater management plans, aggregate extraction planning, agricultural policies and monitoring program, OMAFRA educational program	ASAP – over a 2-5 year period, Region of Peel is currently in the process, Phase 4 – Implementation - to be initiated by staff	$50 000 – 200 000
	As part of the WHPS, develop an environmental practice assessment for individual property owners in capture zones and recharge areas, to assess the potential concerns with respect to contaminant migration from each property	Individual owners	Individual owners	WHPS, OMAFRA agricultural program	ASAP	Minimal
	Develop a regional long-term plan related to aggregate extraction below the water table on a subwatershed basis and an assessment of potential cumulative impacts	CVC	Aggregate producers, CVC	Development of a comprehensive long term monitoring program. Refine and utilize the existing groundwater flow model	Develop ASAP after an implementation committee is formed	
Greenlands Plan	Official Plan policies and schedules should recognize identified and assessed terrestrial communities and watercourse/riparian and valley land corridors. Natural areas not identified within the Official Plans should be **protected** and/or **enhanced** to the extent practical.	Caledon (OPA 124), Peel, NEC	**Protection**: CVC, MNR, landowners **Enhancement**: Peel, Caledon (OPA 124), MNR, community groups, landowners	Planning Act, Caledon and Peel Ops, CVC Stewardship and Restoration Program, Credit River Fisheries Management Plan, MNR CFWIP	Immediate (0–5 years)	N/A

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	A "Gap Analysis" should be carried out to ensure that all important features, functions and linkages are adequately protected in the Official Plans.	Caledon, Peel	**CVC**	Official Plans, Municipal By-Laws	0-5 years	N/A
	High and moderately sensitive corridors should be designated as "natural corridor"; low sensitivity corridors as "supportive natural system"; high and moderate priority terrestrial as "woodland core"; and low terrestrial as "woodland", as per OPA 124; and then eventually zoned	Caledon	CVC, Peel, MNR	Planning Act, Ops, and by-law	0 – 5 years	N/A
	Require Environmental Impact Reports for development proposals which may affect natural communities or corridors either directly or indirectly.	Caledon	Peel, CVC	Ops, CVC EIR Guidelines	0 – 5	N/A
	Encourage securement of key significant natural areas by public agencies or groups (for example, there are approx. 4,345 ac. Of High and Medium Priority terrestrial lands representing forest and wetland)	Peel, Caledon, NEC	CVC, MNR, Interest Groups, Land Trusts, landowners	Municipal Act, OP, foundations and other charitable organizations	0 –5 years and beyond	$2500 to $4500 per acre at market value
	Establish a tree cutting by-law to discourage indiscriminant tree cutting	Peel, Caledon	MNR, CVC	Trees Act, Municipal Act	0-5 years	enforcement and administra-tion costs unknown
	Improve public access and parking at lower end of Forks Provincial Park and near Cataract (Trailway)	Municipality	CVC MNR	Municipal by-law	5-10years	$10 000
	Rehabilitate pits where extraction has occurred below the water table to make them suitable for public recreation	Municipality	Landowners	Sale or easement	As available	$100 000
	Implement planning and construction guidelines	Municipality, CVC	Private Developers	Planning Act, Municipal Act	0-5	N/A
B-Rehabilitation and Retrofit						
Surface Water Management Plan	Identify on-line ponds that have the potential for dam failure, overtopping and property damage (other than the Melville Dam), and identify their impact on the fishery. If impacts are negative, mitigate or rehabilitate.	CVC	MNR, landowner	Credit River Fisheries Management Plan	As feasible	$2000 - $6000 per pond

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Investigate mitigation/removal of Melville Dam	CVC	MNR MOE landowners		5-10 years	$5000 - $100 000
	Monitor leachate / mine out landfill	Region of Peel	CVC, Municipality MOE	Water Resources Act	Ongoing	$1 000 000+
	Caledon Creek – downstream of Hwy 10 – restoration of channel form and aquatic and riparian habitat Caledon Creek & Credit River – 1st & 2nd order channels – restore plan form & corridor	Town, CVC, MNR	MNR, Public interest groups, angler clubs, school groups, landowners	Federal Fisheries Act, Provincial Stream Corridor guidelines, Provincial natural channel design guideline, Aggregate Resources Act	0-5 years	$500/m
Groundwater Management Plan						
Greenlands Plan	Restore or enhance fragmented communities: A. Increase buffer around wetlands (120 m for High Priority, 50m for Moderate Priority and 30 m for Low = 453 hectares for Sub 16 and 163 hectares for Sub 18)	CVC, Caledon	Peel, landowners, Interest Groups	CVC Stewardship Program, Wetland Habitat Canada, MNR – CWFIP	A. High Priority 0 – 5 years, Med Priority 5 – 10 years, Low Priority 10 – 20 years	A. N/A (i.e. land retirement)
	B. Increase total wetland area (83 hectares of old fields (“cultural communities”) and non-intensive agriculture on muck and bottomland soils in Sub 16 and 160 hectares in Sub 18)	CVC, Caledon	Peel, landowners, Interest Groups	CVC Stewardship Program, Wetland Habitat Canada, MNR – CWFIP	B. 0 – 10 years	B. $5 000

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	C.1 Re-connect high priority deciduous forest west of Hwy 136 in Sub 18, 350 metres upstream along tributary corridor C.2 Re-connect high priority forest complex around Green Lake in Sub 16, 850 metres downstream along tributary corridor C.3 Re-connect "Caledon Village Wetland" 150 metres upstream along tributary corridor	CVC, Caledon	Peel, landowners, Interest Groups	CVC Stewardship Program, Wetland Habitat Canada, MNR – CWFIP	C. 0 – 5 years	C.$5180 + 12 580 + 2220 = $19 980
	D. Increase total forest cover by restoring 490 hectares in Sub 16 and 596 hectares in Sub 18	CVC, Caledon	Peel, landowners, Interest Groups	CVC Stewardship Program, Wetland Habitat Canada, MNR – CWFIP	D. High priority corridors and Interior Habitat areas 0-5 yrs., moderate priority 5-10 yrs., low 5-15 yrs	D. $1 600 000
	E. Increase percentage of interior core habitat by restoring 64, 177 and 28 hectares of high, moderate and low priority area in Sub 16 and 14, 13 and 1 hectare in Sub 18.	CVC, Caledon	Peel, landowners, Interest Groups	CVC Stewardship Program, Wetland Habitat Canada, MNR – CWFIP	E. High priority areas with some core 0 –5 yrs., moderate priority 5 – 10 years, low 5 – 15	F. High P. = $115 440 Mod. P. = $281 200 Low P. = $49 920
	Further assess and rehabilitate main river from Melville Dam through to Osprey Exchange Lands	CVC	MNR, Trout Unlimited, Izaak Walton, Ontario Streams and Osprey Golf	Trout Unlimited Strategy, Credit River Fisheries Management Plan	0-5 years	$50 000
	Develop specific Fisheries Management Plans for abandoned pits (including rehabilitation, stocking and regulations)	MNR	Landowner, CVC	Credit River Fisheries Management Plan and Strategic Plan for Ontario Fisheries	5-20 years	$5000 per plan with rehab/ stocking costs

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Identify and rehabilitate other stream fisheries not investigated during the study.	CVC	MNR, Landowners, municipality	Credit River Fisheries Management Plan Environmental Farm Plan	As feasible	$500 per property for investigation rehab is $10 per sq. metre for shrubs and $20 per sq. metre for trees
C-Stewardship and Education						
Surface Water Management Plan	Periodically advertise water quality issues in local newspapers and at CVC website. On CVC website, provide linkages to other websites with more detailed information on water-quality related environmental issues.	CVC CVC	 Environment Canada, MOE, CCME		0-5	$1000 $1000
Groundwater Management Plan	Develop an education and stewardship program in rural areas to protect recharge	CVC, Municipality	CVC, municipality, Provincial government (MOE, MNR, OMAFRA)	Action is part of the same program to protect groundwater recharge areas	ASAP	$10 000 - 50 000
	Develop an education program as part of a Wellhead Protection Strategy	Municipality	Municipality (Region and Town)	Part of a general Wellhead Protection Strategy	ASAP	$10 000 – 50 000
Greenlands Plan	Promote Environmental Farm Plan	OMAFRA CVC	Landowners			$1000 / farm
	Promote stewardship/monitoring golf course program	CVC	MOE Municipality, Fish and Naturalist Clubs Landowner	Audubon Program	0-5 years	$5000 – 10 000
	Angler education program	MNR	CVC Fishing Clubs	Credit River Fisheries Management Plan	Ongoing	$5000
	Promote & increase awareness of stewardship	Schools, public interest groups	MNR, MOE, OMAFRA, CA		0-5 years	

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Prepare Conservation Plans (priority properties based on willing landowners and high community sensitivity)	CVC	University of Guelph, Peel, Caledon, landowners	Conservation Planning Service (a CVC/UofG partnership)	Year 1: 5 high priority properties as part of pilot study 2nd yr, 2 – 5 years other priority properties	Cost to be determined
	Provide Workshops and a Subwatershed Landowner Stewardship Manual	CVC	Peel, Caledon, MNR, landowners	CVC Stewardship Program	0 – 5 years	$15 000
	Provide increased opportunities for outdoor recreation and nature appreciation (e.g. extension of trail from Forks to Melville)	CVC, Peel, Caledon	landowners, MNR, trails groups	Charles Sauriol, Conservation Area, the Grange Property, Forks of the Credit Provincial Park, Credit Valley Footpath	0 – 5 years	N/A
D-Monitoring						
Surface Water Management Plan	Development of a water quality monitoring program as part of the Wellhead Protection Strategy (WHPS)	Region of Peel	Region of Peel, Town of Caledon	Monitoring of site specific performance for storm water facilities	ASAP as part of the WHPS	$50 000 – 100 000- Annual $15 000 – 20 000
	Monitor bacteria levels during storm events upstream of Cataract	Region of Peel	MOE, CVC	Ontario Water Resources Act, Environmental Protection Act, CVC Integrated Watershed Monitoring Program	0-5	$1000

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Monitor benthic invertebrates as indicators of change	CVC/MOE	MOE	Fisheries Act, Water Resources Act, Environmental Protection Act WRA, EPA, CVC Integrated Watershed Monitoring Program	0-5	$2000
	Monitor water quality chemical parameters to quantify changes	CVC	MOE	Fisheries Act, Water Resources Act, Environmental Protection Act, CVC Integrated Watershed Monitoring Program	0-5	$2000
	Establish two geomorphic monitoring sites on Caledon Creek, one near the confluence of the Credit, the other upstream of the major aggregate operations in conjunction with the Credit River Monitoring Strategy	CVC	CVC, MNR, Town	CVC Integrated Watershed Monitoring Program	0-5 years	$5000 1st year, $2000 each subsequent year
Groundwater Management Plan	Development of subwatershed scale monitoring program to assess long term trends in recharge (water table conditions) and baseflow	CVC	CVC, Municipality, Provincial government (MOE, MNR)	CVC Integrated Watershed Monitoring Program, Other monitoring programs	On-going, but needs to be more comprehensive	$40 000 - $50 000 1st year, Annual cost of $15 000 - $20 000

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Development of comprehensive site specific groundwater and surface water monitoring program related to aggregate extraction and development of an associated data base.	CVC, MNR	CVC, MNR, Aggregate Producers, Town of Caledon	CVC Integrated Watershed Monitoring Program; Other monitoring programs and resource policies	On-going on a site specific basis but a comprehensive program needs to be developed once an implementation committee is formed	N/A
E-Research and Development						
Surface Water Management Plan	Sample fish flesh in Credit River and send to MOE for analysis and publication	Sampling by CVC	Electrofishing volunteers	Guide To Eating Ontario Sport Fish Program, CVC Integrated Water Monitoring Program	0-5 years	$500
	Re-measuring existing field sites and sites in the Annable (1996) database to evaluate effects of upstream land use on the channel	CVC		CVC Integrated Watershed Monitoring Program, EIR associated with land use change	1-10 years	$1 000 per site
	Evaluation of weathering processes on Caledon Creek.	Universities, CVC		Research grant, or possible condition for water taking permit	1-5 years	$20 000
	Installation of in-situ sediment traps, especially on Caledon Creek.	Universities, CVC			1-5 years	$10 000
	Monitor fish populations annually at 3 sites and conduct annual spawning surveys	CVC	MNR Municipality	Credit River Fisheries Management Plan, CVC Integrated Watershed Monitoring Program, Natural Heritage Policy and Planning Act	Ongoing, once a year	$600 per year

PLAN COMPONENT	ACTION	FACILITATOR	CONTRIBUTOR	RELATED IMPLEMENTATION MECHANISM	TIMEFRAME	COST
	Given the recreational and economic value of the Credit River fishery, initiate data collection and manage study	MNR	CVC, Municipality	Credit River Fisheries Management Plan	2 years	$5000
	Develop a user friendly interactive data base to optimize data collection between all stakeholders	CVC, Municipality	All stakeholders	CVC Integrated Watershed Monitoring Program, Other Monitoring programs	2 – 5 years	$30 000–100 000 development $5000 – 10 000 annual cost
	Develop a protocol to maintain barriers between water table excavations so that changes to hydraulic heads are minimized.	MNR, DFO	CVC, Town of Caledon	Fisheries Act, Aggregate Resources Act, Planning Act	2 years	N/A
Groundwater Management Plan	Maintain and refine the groundwater model as a more extensive data base is developed, to use as a more predictive tool in the future.	CVC	Conservation Authority, Municipality, aggregate producers	CVC Integrated Watershed Monitoring Program, Other Monitoring programs	On-going	Average annual cost $5000 – 10 000
	Develop a user friendly interactive data base to optimize data collection between all stakeholders	CVC, Municipality	All stakeholders	CVC Integrated Watershed Monitoring Program, Other Monitoring programs	2 – 5 years	$30 000–100 000 development $5000 – 10 000 annual cost
Greenlands Plan	Collect data on wildlife and wildlife habitat to better understand species relationships.	Interest Groups, researchers	CVC, Peel, Caledon, MNR	CVC Natural Heritage Program	0 –10 years	N/A
	Monitor changes in terrestrial communities and success of restoration projects	CVC, Interest Groups, Researchers	Peel, Caledon, MNR, Interest Groups	CVC Integrated Watershed Monitoring Program	ongoing	$