NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

July 9, 2010

Allan Hearne 726
Senior Development Planner
City of Guelph
City Hall, 59 Carden Street
Guelph, ON N1H 3A1

Dr. Mr. Hearne,

Re: Hanlon Creek Business Park Environmental Implementation Report Outstanding Items

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The attached revised Agency and Environmental Group EIR Comment table and appended materials provide a complete list of comments that pertain to the February 2009 Hanlon Creek Business Park Environmental Implementation Report (EIR). By way of the EIR Comment Table and appended materials, outstanding EIR comments have been addressed.

It is intended that the following package will be an appendix to the HCBP EIR (NRSI 2009):

- Cover letter
- Agency and Environmental Group EIR comment table
- Tree and Shrub species table
- Revised Recommended Site Plan checklist
- HCBP Siting Protocol and Factsheets
- Revised figures (surface water monitoring stations, pedestrian and open space trail system)
- Public Liaison Committee (PLC) Response Tables
- Correspondence related to February 2009 EIR
- Correspondence related to Agency and Environmental Group EIR Comment Table
- Revised Consolidated Monitoring Program

I trust the following information is adequate. Should you have any questions or comments, please do not hesitate to contact the undersigned.

Sincerely,
Natural Resource Solutions Inc.

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Terrestrial and Wetland Biologist

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Agency and Environmental Group EIR Comment Table

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Agency Review Comments				
Environmental Advisory Committee (April 8, 2009)		The Environmental Advisory Committee supports the Environmental Implementation Report prepared by Natural Resource Solutions Inc. (NRSI) for the Hanlon Creek Business Park subject to the following:		
	1	That no sanitary sewer is routed along the old Laird Road right-of-way	Sanitary sewer is required on the portion of old Laird Road that is to remain open (from Hanlon Creek Boulevard to Block 15). No sanitary sewer is proposed on Laird Road west of Block 15.	
	2	That any watermain routing along old Laird Road be undertaken by tunneling to limit impacts on the wetland and watercourse and that the depth of the watermain should allow for the eventual removal of the road bed.	It was proposed to install the watermain crossing of Tributary A using trenchless construction techniques. The use of trenchless techniques and the depth of the watermain for the remainder of the watermain construction on old Laird Road will be reviewed for feasibility and costs with the City Engineering Department prior to tendering.	
	3	That as part of Phase 3 the road bed in the closed portion of the old Laird Road be removed and restored. If complete removal is not feasible, the road height and width should be reduced, road surfacing should be converted to a non-paved surface, road verges naturalized and wildlife/amphibian crossings be considered.	The City has determined that the section of Laird Rd to be closed no longer needs to be maintained as an emergency access, therefore, the road bed will be removed within this section and restored.	
	4	That interim mitigation measures be employed to limit amphibian crossing until the closure of the old Laird Road.	NRSI, the City and MNR have worked to develop appropriate interim mitigation measures to limit amphibian movement across Laird Road until closure. Wildlife culvert locations will be recommended based on information obtained through the 2009 Laird Road mortality surveys, 2010 Laird Rd spring amphibian surveys.	
	5	That wildlife/amphibian crossings be considered as part of the design for the new Laird Road in Phase 3.	Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Environmental Advisory Committee (April 8, 2009)	6	That confirmation of the presence or absence of the Jefferson Salamander is provided with the Endangered Species Act 2007 and the Recovery Strategy must be provided in consultation with MNR.	NRSI and the City worked in consultation with MNR staff and Dr. Jim Bogart to finalize a comprehensive salamander monitoring program within the business park for spring 2010. Salamander monitoring was conducted throughout the business park from March 11 to April 30, 2010. A total of 13 salamanders were captured, they were identified to be pure blue-spotted salamander (1) and members of the complex dominated by the blue-spotted genome (12). No Jefferson salamanders or members of the blue-spotted Jefferson complex dominated by the Jefferson salamander genome were trapped during the 2010 monitoring period.	
	7	That strategies to inventory and conserve the Western Chorus Frog occurrences on site be developed consistent with the federal Species at Risk Act and the provincial Endangered Species Act in consultation with MNR.	Western chorus frog (*Pseudacris triseriata*) is currently not protected under the Species at Risk Act or the Endangered Species Act. Previous observations of western chorus frog within the business park have been made within the wetland features being retained as part of the development plan. However, NRSI will continue to monitor wetlands on-site annually using the accepted Marsh Monitoring Methodology to document the presence/absence of western chorus frog within the business park.	
	8	That a comprehensive and consolidated monitoring program which specifies frequency, location, protocols, timing, thresholds, and specific contingency measures be submitted and approved by the City of Guelph and the GRCA.	NRSI has developed the Terms of Reference for a comprehensive and consolidated monitoring program with input from AECOM and Banks Groundwater, that will be submitted to the City and GRCA for review and approval.	
	9	That EAC's concerns with the thermal modeling report be addressed, more details be provided on the potential contingency measures and the potential effect of the contingency measures be assessed.	Details on contingency measures have been provided in the Terms of Reference for a consolidated monitoring program developed by NRSI with input from AECOM and Banks Groundwater.	
	10	That the developer's environmental monitoring period continue 2 years after 75 percent build-out of Phase 1, 2 and 3 of the business park.	Environmental monitoring will continue 2 years after 75% build out of Phase 1, 2, and 3.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Environmental Advisory Committee (April 8, 2009)	11	That planting of local genetic stock be specified in the EIR.	Text within the EIR states that 'The goal behind the restoration planting plans was to create naturalized buffer and enhancement areas with the use of hardy, native species indigenous to the Guelph/Wellington Area" and "Efforts should be made to obtain locally sourced seed, tree and shrub stock for naturalized plantings." Additional reference to local genetic stock will be included in the restoration tender package.	Section 5.0 Buffer Design and Restoration Plantings and Section 17.5 Tree Retention and Landscape Plantings
	12	That additional plantings including tree species be provided along the Downey channel to maximize cooling - with input from Union Gas.	Union Gas requests that no tree or shrub species be planted within the Union Gas easement to allow for maintenance access and avoid potential impact to gas main.	
	13	That special consideration is given to those bird species identified to be in decline.	A provision of habitat types important for declining bird species are being retained within the Development Plan, including open meadow, wetland and woodland.	Section 5.0 Buffer Design and Restoration Plantings
	14	That retention or creation of habitat connectivity, corridor/linkage from the central wetland/woodland area to the heritage maple grove, and to habitats south of Forestell Road be implemented as part of Phase 3.	A corridor/linkage from the central wetland/woodland to the Heritage Maple Grove and habitats south of Forestell Rd. will be implemented within Phase 3.	
	15	That funding mechanisms for the implementation of the recommended contingency measures be considered as part of the subdivision agreement.	Funding mechanisms will be included as part of the Subdivision Agreement.	
	16	That pertinent correspondence - related to the February 9, 2009 - EIR (i.e. memos from City staff to consultants, staff summary reports to EAC, GRCA correspondence, emails, etc.) be included in the Appendices of the final, approved EIR.	See appended document - Relevant Correspondence Re February 2009 EIR	
	17	That LID measures be considered at site plan approval stage.	LID measures will be considered at the Site Plan Stage.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**Laird Road**		
	18	The EIR, AECOM Drawings and Appendix XXI contain conflicting statements regarding the construction of a sanitary main and a water main along Laird Road. The most recent engineering drawings proposed a watermain only through the closed section of Laird Road. This needs to be clarified.	Engineering Drawings should be referenced for most recent information. The watermain will only run through the closed section of Laird Road.	
	19	The watermain installation on Laird Road should avoid the amphibian breeding season.	Prior to any construction works commencing, it will be recommended that the watermain installation occur outside of the amphibian breeding season.	
	20	Based on discussions with City Engineering staff, the need for the emergency access may no longer be necessary. I recommend we make a concerted effort in Phase 3 to ensure Laird Road and the associated road bed is removed and naturalized.	Agree. To be addressed through Phase 3 EIR.	
	21	Please confirm in the EIR and engineering drawings that the asphalt surface will be removed. Perhaps a Granular B material could be proposed until the ultimate closure of Laird Road is examined in Phase 3.	To be addressed through Phase 3 EIR.	
	22	Additional deciduous plantings should be installed following the closure of Laird Road to provide some additional canopy cover.	Additional plantings will be recommended along Laird Rd. once the road bed has been removed. Detailed planting plans for the closed portion of Laird Road will be included in the Phase 3 EIR.	
	23	Mitigation Measures recommended in the EIR should be employed in the interim to reduce amphibian mortality.	Barrier fencing, as recommended by NRSI and MNR was installed in November 2009 to ensure mitigation measures are in place for the amphibian breeding season. From information obtained from the 2009 Laird Road mortality surveys and 2010 Laird Rd amphibian surveys, wildlife culvert locations will be recommended. Culverts will be installed along Laird Road prior to the fall amphibian migration period. The City will also post wildlife signage along Laird Road to alert motorists of potential crossing locations.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**New Laird Road**		
	24	Can the new Laird (Phase 3) be designed to accommodate critter crossings at the most southerly end to allow for amphibian and small mammal movement should we secure additional lands for corridor purposed through the site plan process?	Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.	
		Jefferson Salamanders		
	25	Confirmation is needed regarding the presence of Jefferson Salamanders. Additional monitoring following MNR's established protocol is proposed for this spring. Prior to grading in the immediate vicinity of the Heritage Maple Grove and adjacent to the PSW's, the presence/absence of this species must be confirmed. However, staff are aware that the Draft Recovery strategy indicates that they are likely extirpated from Guelph. Staff have been consulting with MNR and will continue to consult with the Ministry to ensure the proposal conforms with the Endangered Species Act.	NRSI and the City worked in consultation with MNR staff and Dr. Jim Bogart to finalize a comprehensive salamander monitoring program within the business park for spring 2010. Salamander monitoring was conducted throughout the business park from March 11 to April 30, 2010. A total of 13 salamanders were captured, they were identified to be pure blue-spotted salamander (1) and members of the complex dominated by the blue-spotted genome (12). No Jefferson salamanders or members of the blue-spotted Jefferson complex dominated by the Jefferson salamander genome were trapped during the 2010 monitoring period.	
		Significant Bird Species		
	26	Some additional consideration should be given to the significant bird species identified on site. Retaining more hedgerows and avoiding mass grading would assist to protect some of the habitat for these species - at least in the interim. At the site plan level we may be able to reduce area parking and coverage to retain some of the meadow/field areas as well as the hedgerows.	Generally, area grading precedes servicing works so the most cost effective earth moving equipment and methods can be used. If the area grading is not completed at the initial stages of the project, increased costs and damage to newly constructed works are likely. Area grading is required to ensure that the approved grading design can be implemented on each Block.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**Grading**		
	27	Can grading activities avoid some of the smaller wetland features during the spring breeding season? Those identified to be removed could be filled in once the breeding season is completed or left to the site plan process where they may be incorporated into the design.	Input from NRSI and City Environmental Planner regarding timing/area restrictions will be written into the tender documents for the grading work. In the event clearing and grubbing activities overlap with the amphibian breeding season, NRSI has obtained the necessary permits from the MNR to undertake wildlife collection and relocation within ponds prior to being removed.	
	28	Given the tight timeline do we foresee grading activities extending into the fall and winter months? If so, how will we ensure the site remains stabilized?	Approvals already received include sediment and erosion control measures that will function on an on-going basis.	
	29	Would it be possible to avoid mass grading and grubbing at the initial stages to retain some of the hedgerows and existing topography? Could a staged grading plan be considered?	Generally, area grading precedes servicing works so the most cost effective earth moving equipment and methods can be used. If the area grading is not completed at the initial stages of the project, increased costs and damage to newly constructed works are likely. Area grading is required to ensure that the approved grading design can be implemented on each Block.	
		Tree Protection		
	30	Tree protection fencing is identified as Type 2 silt fencing, however, adequate signage around the treed portions of the site (particularly the Heritage Maple Grove) should be provided. Often trees are inadvertently removed as contractors are not aware that the trees are to be protected. Tree protection signage must be erected.	Tree protection signage will be erected prior to grading. Fencing and signage around the Heritage Maple Grove is already in place.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**Monitoring**		
	31	The current EIR recommends monitoring take place until 75% build out. Page 91 of the Environmental Impact Study recommends that monitoring take place two years post substantial 80% build-out. In conformance with the EIS recommendations, it would be prudent to monitor a minimum of two years post 75% build out. The most recent correspondence, March 31, 2009, from AECOM to GRCA indicates that the developer has agreed to two years of post development monitoring following 75% build out. Please ensure this item is identified in the subdivision agreement.	Environmental monitoring will continue 2 years after 75% build out of Phase 1, 2, and 3.	
	32	The EIR states that after 75% build out, "State of the Watershed monitoring will take over." State of the watershed monitoring is not designed to monitor specific properties or their associated impacts. It is a watershed based approach to reviewing water quality, quantity and flooding in the Grand River and its tributaries. This is not an appropriate monitoring proposal; therefore, any reference to State of the Watershed Monitoring should be removed.	The State of the Watershed monitoring will not be referenced in the future.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)	33	Section 10.0 speaks to monitoring and contingency measures. Appendix XXI recommends "the long-term groundwater monitoring program could therefore be the responsibility of the City, with the potential of establishing cost-sharing arrangements with each land-owner in the HCBP." Given the estimated cost of the comprehensive monitoring program (groundwater, benthic, water temperature, etc.), it seems reasonable that the City enter into these recommended cost-sharing agreements to ensure long term monitoring does not become the responsibility of the local tax payers or be deferred to State of the Watershed Reporting. Contingency funds should also be allocated through the subdivision agreement to ensure money is available for mitigation measures should they be deemed necessary.	Cost-sharing agreements and contingency funds will be addressed through the Subdivision Agreement process.	
	34	Table 6-9 in the EIR, do not provide adequate details regarding triggers and contingency measures - if monitoring does document some significant changes what kind of adaptive management approaches/tools can be employed? The contingency measures for all monitoring components must be clearly identified in the tables.	NRSI, AECOM and Banks Groundwater will develop a report that will provide details on contingency measures (to be submitted in spring 2010).	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)	**35**	Table 6 - Fish Community and Monitoring Analysis states, "Specific quantitative triggers are not recommended at this time due to the absence of brook trout." This statement does not reflect the finding in the 2008 aquatic monitoring data which indicates that 4 brook trout were captured in Tributary A.	NRSI has 5 quantitative monitoring stations where they sample fish in a way that generates statistical estimates of the fish populations at each of those stations. This type of sampling allows NRSI to monitor increases or decreases in the size of fish populations that are present. To monitor the size of brook trout populations, NRSI must capture brook trout in these stations. The brook trout captured in 2008 were not found in any of these stations. They were captured during general qualitative sampling to try to determine if brook trout were anywhere on the site. Furthermore, there were only several individual fish, and no brook trout were captured anywhere on the site during a similar exercise in 2007. Although 4 brook trout is the number of fish found in 2008, the absence of brook trout in 2007 and 2009 sampling does not represent any sort of trigger or cause us any concern. The numbers alone are simply too small and sporadic to draw defensible conclusions related to habitat and associated impacts. As a result, we cannot define a degree of change in the size of the brook trout population that represents a trigger when we have such limited and sporadic instances of brook trout capture. Also, we have not been able to identify quantitative station locations that would improve the effectiveness of the monitoring. The current monitoring stations allow NRSI to monitor the populations of the fish species that are captured on the site, including any brook trout found in those stations. It is quite reasonable to expect to find brook trout at the current stations if they are present in substantial numbers in Tributary A. This information allows NRSI to monitor changes in the overall fish community as supporting information for the monitoring program.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)	35		Although NRSI has not defined brook trout population triggers, there are quantitative triggers for the overall fish community, for the benthic invertebrate community, and for water temperature. The water temperature triggers have been defined according to the brook trout temperature requirements. In addition, the Rapid Assessment and Action Protocol outlined in the Consolidated Monitoring Program can deal with any observations of concern that arise during monitoring, including quantitative concerns. We fully agree that Tributary A is a cold-water watercourse to be managed as cold-water fish habitat, with brook trout as a target species. Quantitative triggers based on the brook trout population (number of brook trout) can be added at any point when it becomes possible to define changes in the population in a useful and defensible way.	
	36	Appendix XXI indicates that a "terms of reference for these monitoring components will be submitted to the GRCA and the City for review." A comprehensive terms of reference for the monitoring plan should be reviewed and approved by GRCA and City staff prior to any grading and grubbing activities.	NRSI has developed the Terms of Reference for a comprehensive and consolidated monitoring program with input from AECOM and Banks Groundwater, that will be submitted to the City and GRCA for review and approval.	
	37	Monitoring details do not speak to monitoring of the constructed channel (as requested by Carrie Musselman, August 26, 2008)…."*Section 9.0 Monitoring needs to include Creek, Culvert Crossings and Constructed Channel Monitoring.* "	This monitoring will be carried out on a regular basis during construction activities, and monitoring reports will be provided at regular intervals. Monitoring reports for the culvert crossings and constructed channel will be included in the annual Consolidated Monitoring Report(s).	
	38	Monitoring of stormwater managements facilities performance, sediment accumulation and landscaping survival is still not well documented in the monitoring section of the EIR (as previously indicated by Carrie Musselman, August 26, 2008).	Monitoring details for the stormwater management facilities have been included in the Terms of Reference for a consolidated monitoring program developed by NRSI with input from AECOM and Banks Groundwater.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**Downey Channel**		
	39	Drawings to depict the natural channel design should be provided to ensure the channel is constructed properly with pools, riffles and adequately sized meanders; however, I do understand that ultimate approval of this channel is the responsibility of the GRCA/DFO.	The Downey watercourse is an intermittent water course. GRCA comments received on AECOM's proposed design included: 1) remove the near vertical side slopes - plan now shows 2:1 side slopes with a 0.5m bottom width and 0.5m depth 2) remove the riverstone lining - plans now show native material along bottom of channel 3) design to mimic the existing conditions - plans now show that many of the original meanders are removed	
	40	Additional tree plantings should be incorporated on the associated landscape plan to assist with naturalization.	NRSI will work with the City and Union Gas to determine where additional tree species can be planted along the Downey Channel to maximize cooling.	
		Buffers		
	41	There are several locations on the engineering drawings where is appears that grading activities will encroach into the 5 metre no touch buffer. Was this agreed to by GRCA staff? From the City's perspective the 5 metre no touch buffer must be strictly adhered to.	To clearly show the fencing, sediment control and grading limits on the drawings requires that we show separation between the lines that makes it look like the fence encroaches within the 5m space; however, there is a note included on the drawings that describes this and clarifies that the fencing is to be placed on the property boundary (which has been set with a minimum of 5m of separation).	AECOM Drawings
		Heritage Maple Grove		
	42	The EIR states that, "since the grove is currently growing on lands that are higher in elevation, on well drained soils, no change in soil moisture regime within the stand is anticipated" (p.31). Is this conclusion supported by the hydrogeologic findings?	Groundwater monitoring has been on-going in the vicinity of the Heritage Maple Grove at one monitoring station located immediately north on lands below the elevation of the woods. Throughout the monitoring, water table elevations were over 6m below ground level. Fluctuations in the water at this site were not found to result in groundwater elevations close to the woodland surface. As such, the root zone soil moisture for trees in the Heritage Maple Grove is not affected by water table elevations or fluctuations.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)	43	How will the hydrology to this area be maintained in the interim while extensive grading activities and slope cutting are taking place?	The impervious percentage cover of the Blocks will not change during the grading operations, so there will be little change to the existing runoff and infiltration characteristics of the property. The approved sediment and erosion control design includes measures to contain and control runoff on the Blocks which will also assist in infiltrating runoff.	
		Downey Tributary Crossing		
	44	Please indicate why two - three culvert crossings are proposed on the Downey Tributary. Were additional designs considered?	The two 3 culvert crossings are required to provide vertical clearance to other infrastructure (i.e. utilities/sewers). There is insufficient clearance to provide a single barrel. GRCA has approved this part of the design. Yes other designs were considered.	
		Site Plan Checklist		
	45	The infiltration target rates and associated water balance mapping must be added to the site plan checklist.	The infiltration target rates and associated water balance mapping is required at the Site Plan Stage. Refer to appended Recommended Site Plan Checklist.	Appendix XII - Hydrogeology Report 2008, Figure 17
		Condition of Approval		
	46	Condition 12 specifically states that the comments raised by the Guelph Field Naturalists are to be addressed. The EIR, Appendix XXI and XXII do not specifically address the Guelph Field Naturalist comments.	GFN comments are addressed in this table below.	
		Drawings		
	47	Drawing No. 22490-01-C04 - staging sequence appears to be out of order - please confirm sequence with GRCA Aquatics staff.	GRCA has reviewed and approved the drawings.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 3, 2009)		**Previous Comments**		
	48	The Public Liaison Committee inquired regarding the possibility of forming a natural heritage/watershed group for the HCBP similar to what has been done at Laurel Creek. The group would deal with education issues, monitoring and restoration. Appendix XXI indicates that "this request falls under the mandate of the River Systems Advisory Committee" and should be discussed at their next meeting. Was this recommendation discussed with staff or RSAC?	This recommendation was made by the City's previous Environmental Planner.	
	49	Sketch P01, which was supposed to depict the location of 2004 and 2007 stormwater management facilities, was to be included in the EIR - this was not provided in the most recent copy.	Sketch P01 was included in the February 9, 2009 EIR package that was sent to EAC.	AECOM Drawings (Stormwater Management)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 29, 2010)		**Consoildated Monitoring Report**		
	50	Monitoring components #4 - permit conditions and EIR recommendations - this item is rather vague please specify what this entails.	The specific permit-related monitoring requirements have been added to the document as follows: "Permit-related monitoring includes monitoring of instream construction activities as per the Fisheries Act permitting process (part of the GRCA permit), and the monitoring requirements set forth in the Certificate of Approval from the Ontario Ministry of the Environment for the stormwater management facilities."	
	51	Staff have some concerns with the Rapid Assessment and Action Protocol (RAAP) given a one week timefram is provided to address threshold exceedances and observations of concern. Staff recommend that members of the monitoring team address these issues within 2 business days of collection of the data.	The text in the Consolidated Monitoring Program document has been revised to read "The Monitoring Team members are responsible for reviewing their data for threshold exceedances or other observations of concern. If a member of the Monitoring Team identifies either of these, they must initiate the RAAP by contacting one of the Designated Persons. This must be done immediately so the threshold exceedances or observations of concern can be addressed within 2 days of acquiring the information."	
	52	The Designated persons/group should be confirmed on a yearly basis or when warranted (e.g. staff change).	This requirement has been added to the Consolidated Monitoring Program document.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 29, 2010)	**53**	Staff trusts that the Environmental Inspector will address specific environmental issues that require swift action on site such as deleterious substances within watercourses, fish kills, failure of sediment and erosion control measures immediately upon identifying an issue of concern. These types of issues are time sensitive and must be dealt with in a timely fashion.	Appropriate and timely action will be initiated for such specific issues. These specific issues will also be documented in the Environmental Inspector's reports.	
	54	Please ensure Condition 10 is specifically addressed within the Consolidated Monitoring Report which states, "That the Developer shall provide a qualified **environmental inspector**, satisfactory to the Director of Planning and Development Services, to inspect the site during all phases of development and construction including grading, servicing and building construction. The environmental inspector shall monitor and inspect the erosion and sediment control measures and procedures, compliance with **the Environmental Impact Study and the Environmental Implementation Report on a weekly or more frequent basis if required**. The environmental inspector shall report on their findings to the City on a monthly or more frequent basis."	OMB Condition 10 is now quoted in its entirety in the Consolidated Monitoring Program document.	
	55	The Consolidated Monitoring Program states that monitoring will cease once each phase is 75% built out plus two years. There was a commitment made at the April 8, 2009 EAC meeting that monitoring would continue until 75% build out of the entire subdivision plus two years. This should be clarified.	The Consolidated Monitoring Program has been revised to more clearly reflect Condition 10 of EAC recommendation for approval of the EIR.	
	56	When printed in black and white the Annual Schedule of Activities is difficult to read - please consider using darker bars or hatching for the Gantt chart.	The graphics for the annual schedule of activities have been converted to grayscale.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Suzanne Young - Development Planning Community Design and Development Services, City of Guelph (April 29, 2010)	57	Surface Water monitoring - the monthly surface water data retrieval and a two week review period does not lend itself to the RAAP program. If an exceedance occurs at the beginning of the month, it could be six weeks before the issue is brought to the attention of the designated persons. This does not appear to be in keeping with the intention of the RAAP and the need to monitor the surface water temperatures closely for exceedances.	The standard operating procedures now includes telemetry data access for turbidity and temperature sampling, which will substantially shorten the RAAP response time. The recommended equipment includes an alarm system which can be set to provide a notification when an exceedance occurs. Telemetry system will be included at stations 1, 2, 6 and 7. Historically, stations 6 and 7 have shown the highest recorded temperatures.	
	58	Surface Water - it remains unclear when contingency measures will be required - how many yearly exceedances would require mitigation?	The decision to require contingency measures is based on the details of the particular threshold exceedance. This decision is made by the designated persons responsible for carrying out the RAAP. These persons represent the City of Guelph, the Grand River Conservation Authority, and the Monitoring Team. At this point the review committee has not set out a criteria for this, but will be doing so and meeting on a regular basis to review and discuss.	
	59	Costs associated with contingency measures should be estimated to assist the City and developers to estimate the amount required for the contingency fund.	At this point in time it would not be possible to develop an estimate that could be used for budgeting purposes with an acceptable level of accuracy. The work required would need to be developed specifically for conditions (if necessary), that could only be detailed through the modeling results.	
	60	Developing thresholds, identifying observations of concern and contingency measures for the biological monitoring components (fish, benthic invertebrates, vegetation, soils, breeding birds, and amphibians) is challenging. We understand that NRSI will be reviewing this data based on their "professional opinion" but staff would like some understanding of the studies and background material that will be used to support these opinions and rationale for implementing or not implementing contingency measures.	Certain thresholds have been developed to give some weight to the monitoring analysis and evaluation. These are spelled out in Tables 6.3 to 6.7 under "Thresholds and Observations of Concern". In general, the results for all metrics will be evaluated and compared to previous years data from the same station or plot, as well as to other stations/plots monitored the same year. If any anomalies are seen, these will be addressed.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Helen White - Development and Parks Planning, Community Design and Development Services, City of Guelph (May 6, 2010)	61	I have reviewed the EIR trail plan (plan dated April 2010; received May 5, 2010), and approve it for the EIR amendment.		Appended to EIR Package - Pedestrian and Open Space Trail System
	62	I have reviewed the Phase 1A tender landscape plans (plans dated February 2010; received April 22, 2010), and Phase 2 tender landscape plans (plans dated April 2010; PDF files dated April 5, 2010) and approve these for the EIR amendment.		
		There are some small things I suggest addressing either in Figure L-01 notes page, specifications, or on-site direction as appropriate:		
	63	I suggest that all disturbed slopes over 3:1 receive a Terraseed application at 50mm depth, or other measures to prevent seed wash-out.	Recommendation included in Standard Notes: Terraseed application is to be of minimum depth of 25mm for slopes less than 3:1 and a minimum depth of 50mm for 2:1 - 3:1 slopes.	Phase 1A and Phase 2 Tender Documents
	64	70% seed germination is expected to approve seed applications at end of warantee.	Recommendation included in Standard Notes: Areas of seeding including seed drill and Terraseed applications must have a minimum of 70% cover by native plants and 70% of species from seed mix must be evident in each of the treatment areas.	Phase 1A and Phase 2 Tender Documents

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Helen White - Development and Parks Planning, Community Design and Development Services, City of Guelph (May 6, 2010)	65	There are a few areas where it appears that existing trees, if in poor condition, could be within failure range of trails, swm access roads, and development blocks (e.g. Phase 2 - L-02, L-03, L-05). Conversely, there may be significant good condition trees on or just outside the boundary we could save. The tree inventory does not assess health of woodlot trees in enough detail to catch these. Fencing being installed in the Phase 1 and 2 contracts will limit access to these areas for future removals. I recommend that NRSI's certified arborist check the development areas boundary after surveyor marks it and prior to the installation of the tree protection fencing for any existing trees that are hazards to have contractor remove them, and make minor changes in the fence location to save trees on or just outside boundary wherever possible.	A certified arborist will be on-site during the initial fencing layout to identify potential hazard trees within failure range of trails, swm access roads and development blocks, as well as trees in good condition.	
	66	There are a few areas where the proposed plantings are close to future grading areas (Phase 2 - L-04, L-06). I suggest checking during site visits that the locations for these are far enough away from Phase 3 works.	Restoration planting locations will be assessed on-site for their appropriateness.	
	67	I am prepared to sign off on the EIR now, on the understanding that the remaining Phase 1 landscape plans will address the Parks Planning and Operations comments (Jan 8, 2010), in the same way as the others.		

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Colin Baker - Community Design and Development Services, Engineering Services, City of Guelph (May 7, 2010)	68	Under the proposed RAAP, a threshold exceedance of temperature (i.e. greater than 26 deg. Celsius) and sedimantation parameters could be detected up to one month after an event causing the exceedance with a response in an additional two weeks. Given the severity and sporadic nature of impacts from temperature and sedimentation impacts, the seven week turnaround to collect, analyze, report and investigate the cause of the exceedance is considered unacceptable for these parameters. It is therefore recommended that the RAAP include continuous real-time in-stream temperature and turbidity, as a surrogate for total suspecded solids (TSS), monitoring to ensure impacts to the creek and brook trout population are minimized and environmental protection measures including erosion and sedimentation controls, dust suppression controls, and thermal mitigation features in the stormwater management facilities are functioning and protecting the coldwater stream as intended.	The standard operating procedures now includes telemetry data access for turbidity and temperature sampling, which will substantially shorten the RAAP response time. The recommended equipment includes an alarm system which can be set to provide a notification when an exceedance occurs. Telemetry system will be included at stations 1, 2, 6 and 7.	
	69	Regarding turbidity, it is recommended that a threshold of 10 NTU be established for the creek and that the downstream monitoring station increase in turbidity should be less than 10 percent higher than the upstream monitoring location. Turbidity measurements should be collected every 15 minutes, similar to the measurement frequency for stream temperature. Monitoring locations should include suface water stations #1, #2, #6 and a station downstream of the Pond 2 discharge.	The standard operating procedures now include telemetry data access for turbidity and temperature sampling, which will substantially shorten the RAAP response time. The recommended equipment will be set up at a 15 minute sampling interval and will include an alarm system which can be set to provide notification when a reading exceeds a set point. Telemetry systems will be included at stations 1, 2, 6 and 7. The initial threshold will be set at 10NTU and will be examined after 1 year of monitoring data is collected to determine whether this value is reasonable. Analysis of turbidity increases greater than 10% higher than the upstream monitoring location will be considered in this assessment.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Colin Baker - Community Design and Development Services, Engineering Services, City of Guelph (May 7, 2010)	70	An investigation into potential impacts and the cause of the exceedance should occur within a 48 hour timeframe. Notification of the exceedance and proposed corrective actions including the timeline for implementation should be provided to the City and GRCA within three business days. Monitors should be installed prior to commencement of construction activities at the site which are expected to begin in June 2010.	The standard operating procedures now includes telemetry data access for turbidity and temperature sampling, which will substantially shorten the RAAP response time. The suggested 48 hour investigation and 3-business-day planning and notification of corrective actions is included in the Consolidated Monitoring Program document. Monitors will be installed prior to commencement of construction activities.	
	71	Additional information and minor clarifications are required to address the following:		
		a) Page 9, Section 4.1 - the timelines presented should identify the City as the developer group representative, City as the regulator and GRCA separately. Engineering Services requires the one hard copy and one electronic copy as a pdf of the final Consolidated Monitoring Report by March 31 for the previous monitoring year.	This has been addressed in the revised Consolidated Monitoring Program document.	
		b) Page 11, Section 4.2 - Add that environmental inspections will occur weekly as per OMB Condition 10.	This item has been added as requested.	
		c) Page 16, Section 6.1 - Logger measurement frequency needs to be specified. The wells to be abandoned and the replacement monitoring wells should be identified and labelled on Figure 1.	The logger measurement frequency is indicated as "…daily, or more frequent basis…" in the frequency section of the SOPs for groundwater.	Appended to EIR Package - Figure 2 Hanlon Creek Business Park Surface Water Monitoring Stations

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Colin Baker - Community Design and Development Services, Engineering Services, City of Guelph (May 7, 2010)	71	d) Section 6.2 - All surface water monitoring locations must be shown on a figure and labelled with the monitoring location name. From the SWM pond monitoring plan under Methods, it does not appear that the SWM Pond outlet flowrates will be continuously monitored as required by the C of A.	A review of the naming convention of monitoring sites within the HCBP has been completed with all monitoring stations anticipated for 2011 as shown in attached Figure. The naming convention has been updated based on the addition of monitoring sites in the 2010-2011 monitoring program. The provided naming convention includes a watershed description, general location (tributary name or pond number) and numbering in chronological sequence. For example station HC-A-05 is located within the Hanlon Creek Watershed, within Tributary A and is the fifth station. This format will allow for a general identification of the station based on the description, provide for the addition and removal of sites from the plan and allow for query based searches. A level logger will be included at the pond outlet as well as both upstream and downstream of the pond outlet. This information in conjunction with flow measurements and calculations will provide continuous estimates of pond outlet flow rates.	Appended to EIR Package - Figure 2 Hanlon Creek Business Park Surface Water Monitoring Stations
		e) Sections 6.3 and 6.4 - Has MOE approved the Fish Habitat and Benthic Invertebrates Sampling Protocol as required by the C of A? The SWM Pond C of A requires more frequent analysis of fish habitat and benthic invertabrate sampling than the annual monitoring presented in the CMP.	A letter was sent to the MOE Guelph District Manager on July 5, 2010 outlining the fish and benthic monitoring protocol, and explaining that the monitoring will occur annually instead of during storm events as indicated in the SWM Pond C of A.	
	72	A "consolidated" data management model needs to be established as part of the CMP. The data management model will include all environmental monitoring data in one Microsoft Access database, including all relevant background data collected from the site and any new data collected during the previous monitoring period. The electronic Access database would be submitted to the City's Engineering Services department as an attachment to the Consolidated Annual Monitoring Report due each year by the end of March.	This can be completed in coordination with City staff.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Spring 2009 Laird Road Mortality Surveys - Natural Resource Solutions Inc.	**73**	During Laird road mortality surveys conducted by NRSI in spring 2009, a dead eastern milksnake (*Lampropeltis t. triangulum*) was found. The eastern milksnake is listed as a species of Special Concern by COSEWIC and the MNR; however, it is not protected under the Endangered Species Act (2007). The Guelph Natural Heritage Strategy recommends "flag locally significant species observations, but the level and extent of associated habitat protection be determined on a case by case basis with consideration for each species needs."	Milksnake is found within an extremely wide variety of habitats. It does not appear to prefer any particular habitat type; however, it is often found in prairies, meadows, pastures, hayfields, rocky outcrops and a variety of forest types. It is usually found in areas that are close to a water source. Milksnake is listed as a "specially protected species" in schedules of the Fish and Wildlife Conservation Act, 1997. It is forbidden to hunt, trap, kill, trap or hold in captivity any specially protected species without a permit.	
	74	Based on the status of eastern milksnake and the fact that it is protected under the Species at Risk Act (2007), NRSI recommends that a during-construction siting protocol be developed.	A during construction siting protocol has been developed for eastern milksnake, as well as snapping turtle (a species of Special Concern) and other wildlife species known to occur within the business park. The protocol provides information to all on-site staff on appearance of milksnake, snapping turtle and other wildlife species, habitat, relocation of specimens if found during construction, etc. (permit will be required from MNR to handle any species at risk).	Appended to EIR package
Fred Natolochny - Supervisor of Resources Planning, Grand River Conservation Authority (April 3, 2009)	**75**	At this point in our review of plans and reports prepared in support of this subdivision, we have no objection to the draft plan Phases 1 and 2 proceeding	N/A	N/A
	76	The information provided appears adequate to satisfy condition 67. As there may be requirements for temporary works and the scheduling/timing of works is still not certain, we will wait to clear this condition.	N/A	N/A
	77	*Prior to grading or construction on the site, that appropriate Fill Construction and Alteration to Waterways permit be obtained.*	The City has received the Fill Construction and Alteration to Waterways Permit from the GRCA.	
		We have been advised that a permit application will be submitted. It is our intention to refine the plan in some areas through the permit approval process. These areas are minor and would not impact the overall development scheme.		

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Environmental Group Comments				
Sierra Club of Canada (April 8, 2009)	**78**	The first item is generous buffers linkages & corridors to protect both the wetland and provide sufficient habitat to maintain all functions of the wetland. We know from scientific studies that buffers designed to protect all function of the core wetland need to be about 200 metres to maintain viable amphibian populations. Instead, this plan calls for buffers of 15-30m that only address runoff & sediment concerns. These narrow buffers also include stormwater ponds, a stormwater pond access road and a ditch for stormwater.	Buffers within the Development plan were reviewed and approved by the GRCA in 2000. The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background
	79	The Watershed Study found that "From a planning and zoning perspective….Type 2 lands (i.e. buffers, linkages and corridors) have been subject to significant encroachments…Changes have primarily been losses of agricultural lands and cultural meadows intended by the HCWP to be left as naturalized buffers or corridors. This loss has ironically been facilitated by the EIS process whereby the incremental loss of Type 2 lands has been overwhelmingly recommended and approved." This is exactly what happened with the HCBP EIS.	Disagree. The Development Plan retains and enhances a provision of habitat features, such as woodlands, wetlands, old agricultural fields and cultural meadows.	Figure 4. Restoration and Planting Plan - Key Plan

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Sierra Club of Canada (April 8, 2009)	80	EAC raised concerns on May 12, 2004 that narrow buffers that include stormwater services were a concern and that there were not enough enhancement areas to warrant reduced buffers; Guelph Field Naturalists raised the concern of narrowed buffers in their letter of December 13, 2004, GRCA raised the issue of stormwater services in buffers as recently as December 2008 "Development should not occur in the setback areas." The Committee should also consider that the 1993 study did not contemplate industrial development with 85-90% impervious surfaces in this area. Under such a scenario it is likely much wider buffers would have been recommended.	Buffers within the Development plan were reviewed and approved by the GRCA in 2000. The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background
	81	Would argue that we cannot consider that the proposed buffers, linkages and corridors support the 'bulked up' argument.	The recommendations of the Watershed Plan were reviewed for guidance, and site specific analyses were completed to provide a greater level of detail to guide land use decisions. The identification of enhancement and protection measures (such as setbacks) was iterative, taking into account not only the characteristics of the natural features, but also the nature of the proposed undertaking. It was recommended that emphasis be placed on preserving the central areas of wetlands and woods and that the central areas be 'bulked' up in terms of enhancements. The approach to identifying constraints to development within the study area was based on a balance of recommendations contained within the Hanlon Creek Watershed Plan, as well as site specific conclusions regarding the character and function of natural resources in the study area.	Section 1.8 Natural Heritage of the Hanlon Creek Business Park

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Sierra Club of Canada (April 8, 2009)	82	Another bulking up feature would be improving connectivity within the protected area. As originally conceived, the Laird Road roadbed would be removed. This was cited as key component by EAC on December 8, 2004, a GRCA letter of January 24, 2005 and by GFN in letter of December 13, 2004. However, not only will Laird remain, another road will be added as a barrier across one of the narrowest linkages in the wetland complex.	The City Engineering Department has determined that the section of Laird Rd to be closed no longer needs to be maintained as an emergency access, therefore, the roadbed will be removed and restored, thus enhancing connectivity. A large open bottom culvert will be installed beneath Road A, which will allow movement of wildlife from the northern wildlife area to the central core area.	
	83	Significant amphibian crossings have been confirmed on the site, yet there are no provisions to provide safe amphibian crossing.	Barrier fencing, as recommended by NRSI and MNR was installed in November 2009 to ensure mitigation measures are in place for the amphibian breeding season. From information obtained from the 2009 Laird Road mortality surveys and 2010 Laird Rd amphibian surveys, wildlife culvert locations will be recommended. Culverts will be installed along Laird Road prior to the fall amphibian migration period. The City will also post wildlife signage along Laird Road to alert motorists of potential crossing locations.	
	84	Another component to removing the barriers to connectivity would be to assure that the development blocks do not cut into the central wetland area. You will see that the attached figure shows that block 15 is completely surrounded by core wetland.	The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Sierra Club of Canada (April 8, 2009)	85	Another criterion we could use to assess the success of the 'bulking up' plan is to see if it improves the cold water stream. The modeling for protecting the cold water stream contains many assumptions: that 50% proposed riparian cover can be obtained quickly; that all cooling trenches will include shading as part of mitigation strategy (GRCA comment: thermal impacts as a result of stormwater runoff must be mitigated before discharge to the stream); that untested cooling trenches will work as modeled (GRCA comment: there is a general lack of supporting literature and monitoring data within the industry which makes it difficult to confirm the performance of cooling trench designs at the present time); that hot asphalt need not be considered in the modeling effects; that each industrial lot will be 45% impervious, when 85-90% impervious surface is allowed.	The temperature modeling as outlined in the Hanlon Creek Business Park Stream Temperature Impact Report (AECOM 2009 and Appendix X in the EIR (NRSI 2009)) was reviewed by the GRCA and approved as related to its appropriateness for the HCBP site and the management of Hanlon Tributary A as cold water (Brook Trout) stream.	Appendix X - Stream Temperature Impact Report
		Even with all of these optimistic assumptions, the mitigation strategy would, "Taken as a whole….perhaps lean toward some improvement under future conditions." (Jan 2009 letter to GRCA) If the mitigation fails, suggested strategies include increasing plantings along the stream, floating vegetated islands in SWM ponds, altering stream habitat to provide refuge for brook trout. So again, there is no evidence that this plan provides any real net benefit to the cold water stream; and the "bulking up" test fails.		

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Sierra Club of Canada (April 8, 2009)	86	Another way to determine whether "bulking up" has occurred is to look at the amount of acreage around the wetland that has been preserved and what natural features are being lost. The EIS addendum 3 (p 14) indicated that 132 acres (53.57ha) would be preserved as natural area and setback. We also know that the PSW is about 85 acres (36ha) (per 2000 EIS). So that leaves 47 acres (19ha) protected as buffers and linkages. If you then deduct areas of the buffers devoted to stormwater management, the ditches and roads, which take up 1/2 to 1/4 of the 15-30m buffers (say an average of 1/3), that reduces the buffer area to 31 acres (12.5ha).	Buffers within the Development plan were reviewed and approved by the GRCA in 2000. The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background
	87	If you take into account the loss of 33 acres of hedgerows (which provide habitat and linkages) and 6 acres of isolated wetlands (which provide an important habitat type not found in the core wetland) then one is left with a total of -8 acres of buffers and/or enhancements. And this does not even consider the loss of the Paris Moraine on the southern part of this site, which is obviously a significant environmental feature that provides unique ecological benefits.		
	88	So we can see that in terms of generous buffers, linkages and corridors; improved connectivity; improving cold water stream; and sufficient acreage to clearly demonstrate a "bulking up" of the core wetland, the proposal fails. This is clearly not a "bulking up" and it is likely that the existing resources will actually be degraded.		

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Sierra Club of Canada (April 8, 2009)	89	What started out as an effort to design a development sensitive to the environment has become a classic example of economic desires trumping environmental protections. Every step of the way environmental protections were sacrificed in order to maximize developable land: the narrow buffers around wetlands and woods, putting services in the buffers, removing the small wetlands, removing hedgerow trees, dismissing safe animal crossings, cutting roads and trenches through woodlands, opting for a culvert rather than a bridge.	Disagree. It has always been recommended that emphasis be placed on preserving the central area of wetlands and woods and that central area be 'bulked up'. Buffer plantings have been recommended that provide an array of native vegetation species, thus discouraging introduction of non-native species, while enhancing biodiversity.	
			Safe animal crossings have not been dismissed. The City has determined that the section of Laird Rd to be closed no longer needs to be maintained as an emergency access, therefore, the road bed will be removed within this section and restored, thus providing a safe wildlife linkage. Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.	
			NRSI, the City and MNR have worked to develop interim mitigation measures to limit amphibian movement across Laird Road until closure. Barrier fencing, as recommended by NRSI and MNR was installed along Laird Road in November 2009 to ensure mitigation measures are in place for the amphibian breeding/movement season. From information obtained from the 2009 Laird Road mortality surveys and 2010 Laird Road amphibian surveys, wildlife culvert locations will be recommended. Culverts will be installed along Laird Road prior to the fall amphibian migration period.	
			Area grading is required to ensure that the approved grading design can be implemented on each Block.	
			In terms of opting for a culvert rather than a bridge - a large open bottom culvert was proposed for the Road A crossing. The opening dimensions of the crossing are of equivalent size to a bridge opening and the open bottom allows for re-creation of a natural channel through this area that is currently a man-made online pond.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Wellington Water Watchers (April 8, 2009)	**90**	The Natural Resource Solutions Inc. report (February 2009) on page 128, in the 2nd paragraph, states that the percentage of impervious surface which was modeled in 2004 and approved in the Ontario Municipal Board hearing at 65%, will increase from the 65% to 85%. We are concerned that with 85% of the surface area becoming impervious to water and recharge capacity of that section of the Paris Galt Moraine will be lost.	The OMB approved the increase from 65% to 85%	Appendix XII - Hydrogeology Report 2008, Figure 17
	91	The AECOM report (February 2009) implies that the site will be bulldozed and graded in spring or early summer of 2009. There are many hedgerows of trees and some significant old trees that will be lost if this plan proceeds. We are also concerned about the ability of this approach to preserve Provincially Significant Wetlands. Wholesale removal of over 1,000 trees and these wetlands would destroy the integrity of the site's ability to capture and retain rainwater, further diminishing the recharge capacity. We also have concerns regarding the potential negative effects on water quality from the proposed mass grading of the property.	The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	
	92	The TSH Servicing report of November 2004 on page 29 states that eleven of fourteen smaller isolated wetland areas on the site will not be included as Provincially Significant Wetlands and will not be retained. Our understanding of the original plan was that this site was going to retain many small wetland areas and become a showcase of environmentally responsible development. We have simply seen nothing to assure us that the latest principles of Low Impact Development will be applied to this site.	The Development Plan, showing the loss of the small wetland features, was reviewed and approved by the Ontario Municipal Board (OMB) in November 2006. LID measures will be considered at the Site Plan Stage.	Section 1.7 Background

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Guelph Urban Forest Friends (April 8, 2009)	93	The sloped fields with their hedgerows of mature diverse species are a host and corridor for the many species that sustain us. Each cherry tree alone can support 448 different types of pollinator insects. Stripping these fields of soil for the massive filling in the lower lands will ruin a natural ecosystem that maintains clean water, and air and species. Why the massive filling? Because this site is not suited to its planned use.	Area grading is required to ensure that the approved grading design can be implemented on each Block.	
	94	This development plan does not support many of Guelph Strategic Objectives. For example: 6.1 - "coordinated management of parks, the natural environment and the watershed"	From the on-set of the proposed development, it has recommended that emphasis be placed on preserving the central areas of wetlands and woods and that the central areas be 'bulked' up in terms of enhancements, therefore, it is believed that the business park does support Guelph Strategic Objective 6.1. Development of the business park also supports Guelph Economic Strategic Objectives.	
	95	6.6 - "a biodiverse City with the highest tree canopy percentage among comparable municipalities." Since the accepted standard for municipalities is 40% tree cover, and Guelph is now only 25%, we would like the plan to include the protection of most, if not all, of the 1700 mature trees that are designated to be removed from this site. Since this proposal is at odds with these important goals, GUFF asks that the committee support changes to the plan that will preserve the hedgerows and trees and limit the mass grading of the site. And we urge the committee to recommend that council provide an opportunity for further public comment at a future council meeting.	It should be noted that there are less than 1700 trees being removed as a result of grading. Not all trees to be removed are mature and a number of them are non-native species (i.e. Manitoba maple). Area grading is required to ensure that the approved grading design can be implemented on each Block, therefore, retention of hedgerow trees is not feasible.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**96**	I understand the rationale for constructing the berms early in the construction phase. However, it was my understanding that the berms were to provide noise mitigation in addition to the aesthetic benefits of creating a visual buffer for Kortright Hills residents. Thus the wording (see below) " minimum of 2m high", indicating that it was a "minimum height". Once the berms are constructed and landscaped what happens if an industry wants to locate next to the berm and their noise studies indicate that noise levels exceed MOE guidelines? How will the city require the landowner to mitigate noise since these noise studies are usually done late in the process because noise studies require details of building design, ventilation fans, etc.? The same comments would apply to the berms along Forestell Rd.	As per OMB Condition 50, prior to granting of site plan approval, "the developer shall submit to the City for approval, noise and vibration assessment reports for development on the northerly Blocks 2, 3, 9, 10 and the portion of Block 11 north of Road A, and on the southerly half of Blocks 20, 31, 32, 26 and 37, and the southerly half of Block 38 in order to confirm that the proposed use, activity and development, in hand with the proposed zoning restrictions and regulations, meets the Ministry of Environment noise and separation distance guidelines....At minimum, all proposed development shall be subject to the Ministry of Environment noise/vibration guidelines, standards and requirements in force at the time of execution of this agreement."	
	97	Below are the question and answers related to the impacts of grading on foundation. The line "This survey would probably extend to homes along Teal" should be changed to read "will be required." Given the large amount of fill and the grading and compaction required, the pre-inspection of homes in potentially impacted areas should be required especially now since the SWM pond will be removed and enlarged next to Teal Drive.	Based on the tender package to be submitted to the Contractor, the following is outlined: Pre-construction and post-construction survey - The contractor shall hire an independent Vibration Specialist for this section of work. The specialist shall conduct a Pre-Condition Survey which shall include, at minimum, all structures immediately adjacent to the northern work area of the site. In particular the Survey will include all homes within the Kortright Phase IV subdivision that abut onto the Hanlon Creek Business Park. This will include all structures considered to be of potential risk, including, but not limited to buildings, driveways, sidewalks, swimming pools, patios, etc. The survey report shall indicate the address of each of the properties inspected, the refusals received, and an evaluation of any evident or potential hazards that exist.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**98**	In the EIR, the following is recommended for initial and ultimate grading areas: "areas not built upon within 90 days of being cleared and/or graded must be seeded." The application of a seed mix on any graded area will help reduce the introduction or spread of invasive species. Grading will occur outside of the staked restoration areas and PSW's, eliminating or reducing the spread of invasive species." What will these graded areas be planted with and how will these plants establish themselves on fill with no topsoil?	The seed mix should be applied using a seed drill so as to eliminate the need for expensive topsoil or mulch. Table 4, Section 5.4 (p. 44 in EIR) outlines the herbaceous seed mix recommended for cleared and graded areas.	Section 5.4 Graded Areas, page 44
	99	Also 90 days seems like a long period to leave hundreds of thousands of tones of fill to blow in the wind. If the HCBP gets graded in the spring and no lots are sold the fill will be blowing the entire summer especially during period of drought. Blowing PM 10 and 2.5 are health hazards to humans and other species. If there is no purchaser interest in any lots when the construction phase and grading are finished these areas should be seeded immediately to allow time for plants to establish themselves. This will help to prevent silting of the drainage ditches, SWM and wetlands.	The revised restoration tender package specifies that all cleared areas be seeded within 30 days of being cleared to reduce sediment, erosion and dust issues.	
	100	The chorus frog recovery team should be notified and consulted as part of the EIR requirements.	A provincial or federal chorus frog recovery team does not exist as the western chorus frog is currently not protected under the Species at Risk Act or the Endangered Species Act.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**101**	Are you suggesting that a frog can out hop a car or truck doing the posted speed limit of 50km? How will speed limits help the frogs and snakes? This is unrealistic. If it is cool they are slow moving and also they migrate at night and freeze when they are caught in the headlights so decreasing the speed limit would not appear to be a viable option. As for a wildlife crossing sign how will this help? The spring peepers are so tiny we could barely see them to help them across the road let alone a person in a car or truck.	Wildlife and speed limit signs increase the public's awareness of the potential movement of wildlife along a certain stretch of road. It is anticipated that when made aware, local motorists will reduce their speed to minimize impact to crossing wildlife.	
	102	Until the Laird Road interchange is built is it possible to a) close the road during peak migrations b) allow rescue teams to help the frogs and snakes across the road e.g. a similar rescue happens at Wolfond park each year.	In fall 2009, Laird Road was closed during a portion of fall migration. NRSI has worked with the City and MNR to come up with a mitigation measure for amphibian movement until Laird Road is closed. Barrier fencing as recommended by NRSI and MNR was installed in November 2009 to ensure mitigation measures are in place for the amphibian breeding season. From information obtained from the 2009 Laird Road mortality surveys and 2010 Laird Road amphibian suveys, wildlife culvert locations will be recommended. Culverts will be installed along Laird Road prior to the fall amphibian migration period.	
	103	"Construction of Phase I and II of the HCBP are not anticipated to substantially increase the use of Laird Road through the core natural area, as road connections will route traffic to Laird Road near to the Hanlon Expressway"	Disagree. Once roadways are constructed for the Business Park, it is anticipated that traffic will primarily be routed along Downey Road and Road A, rather than along Laird Road.	
		This statement seems unrealistic as the Straddioto property in the middle of Laird Rd. and the wetland complex will be developed thus it will be built up between 2 of the major migration routes. Since this property has not yet been sold how can you predict that there will be no increase in 24/7 traffic?		

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**104**	Please indicate whether the new SWM ponds near Laird Rd will become amphibian habitat.	SWM Pond 3 and 4, which will be located near Laird Rd. may provide wildlife habitat over-time as the restoration plantings begin to naturalize. However, these ponds are engineered structures that need to be maintained as per the Certificate of Approval issued by the Ministry of Environment requiring dewatering and sediment removal on a periodic basis to maintain appropriate volumes. The timing of these works will respect sensitive amphibian and other wildlife life stages.	
	105	The suggested timing of the breeding period does not appear to take in the months that tadpoles remain in ponds. For instance - green frog's tadpoles remain over the winter months. Remediating a pond that contains green frog tadpoles without any rescue effort could potentially wipe out all the juvenile green frogs for the next summer. Therefore I would like to suggest that the EIR recommend that an individual assessment of wildlife habitat and rescue plan be conducted on each SWM before it is remediated.	SWM Pond remediation can respect the amphibian breeding season (early April to June) and the hibernation period, which begins in late summer and continues till early April. Therefore, pond remediation may be conducted in late June, July and August.	
	106	Since you are including shrubs in your estimate of future canopy cover, please indicate what shrub canopy cover will be removed in the grading of the HCBP. Will it be more than 13.2ha of trees?	A majority of the shrub species within the hedgerows to be removed during grading are common buckthorn (*Rhamnus cathartica*), a non-native, invasive species. Shrubs proposed for removal were located within the hedgerows beneath the canopy cover of trees, therefore, the canopy cover of shrubs to be removed is included in the 13.2ha. The proposed restoration planting plans include approximately 4,937 shrubs that with time will naturalize and provide habitat for local wildlife.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**107**	Please give an estimate in years of how long it will take the new planting to provide the same canopy cover and ecological benefits as the removed trees and shrubs.	A large majority of the tree and shrub species to be removed during the grading process are associated with hedgerows. Thin hedgerows provide very little quality habitat. It is estimated that the restoration plans will provide ecological benefits immediately after planting in terms of open habitats, wooded habitats will be provided within the first few years (native species, food for wildlife). The amount of time it will take for the restoration plantings to mature will vary depending on the tree and shrub species present (i.e. trembling aspen and balsam poplar are faster growing trees than sugar maple and bur oak).	
	108	Please indicate if the planting guidelines and protection are similar to the 2003 Aboud Study: Tree Protection Recommendation Study - This investigation assisted the development of the City's tree protection policy of new subdivisions and infill developments. The study included a review of practices of other municipalities in southern Ontario, and recommendations for best managements practices of a tree protection policy for the City of Guelph. The study included the preparation of tree conservation plans, tree protection during development, and compensation for tree/habitat damage or destruction.	The planting guidelines and tree protection measures outlined in the EIR and Restoration Tender Package are very similar to those outlined in the 2003 Aboud & Associates Inc. Report. Detailed planting guidelines and protection measures will be provided in the revised Tender package to construction workers.	
	109	The EIR needs to identify how parking lot run-off will be mitigated.	The proposed development is divided into 6 separate catchment areas and each catchment area drains to a storm water management facility to provide quality and quantity control of run-off. The proposed facility will consist of two main systems: a collection/conveyance system and a treatment system.	Section 14.0 Stormwater Management

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**110**	HCBP - Site Plan Recommendation Checklist - Please add: → night lighting facilities → disposal of waste water → application: fire route location/fire hydrants/fire dept. connections/annunciator panel	These items are addressed at the Site Plan Stage.	
	111	Depending on the types of industries that locate in the HCBP and the chemicals they are using wouldn't it be prudent to add a recommendation to monitor groundwater quality as well as the recommended groundwater levels? This could be used for an early warning system for the potential future contamination at the Downey Rd. well.	The recommended long-term groundwater monitoring program included in the EIR includes continued monitoring of groundwater quality.	Section 10.0 Monitoring
	112	Accuracy of the mapping of Tributary A1 south of Laird Rd. In the figure appears to cross Laird via the culvert and then runs parallel to Laird Rd (south side) and then dead ends in the ditch on Laird Rd. However, in the field this section of the creek appears to flow north out of the wetland (Block 11) south of Laird Rd before it flows along the ditch and then flows north thru the culvert. I suggest that your mapping of this reach is incorrect.	Mapping of this area has been field verified and is shown on revised mapping.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	113	From the Laurel Creek Watershed Study: Surface water quality is a key leading indicator of environmental conditions for pre, during and post-development activity. The study identifies that "Phosphorus, suspended solids, dissolved oxygen, water temperature and bacteria were identified as appropriate indicators of the physical and chemical quality of the water."	Water quality is included in the Consolidated Monitoring Program developed by NRSI, AECOM, and Banks Groundwater. The water quality parameters include Total Suspended Solids, CBOD5, Total Phosphorus, Dissolved Phosphorus, Metals (total both dissolved and particulate, lead, zinc, copper, *E. Coli,* Total Ammonia Nitrogen, Nitrate - N, Chloride.	
		Laurel Creek Water Quality monitoring, indicators and targets (Table 2.2 in report, benthic, Hilsenhoff Biotic Index, Percent Model Affinity, etc.). Will these be measured in the HCBP and in the lower Tributary A before it exists the HCBP lands? Please compare the HCBP monitoring to that being conducted in Laurel Creek since City Council directed staff to look at the Laurel Creek Monitoring program in relation to the HCBP.	Annual benthic invertebrate biomonitoring has been conducted for the HCBP for 4 pre-construction monitoring years (2006-2009). In comparison to the Laurel Creek monitoring program, data analysis for the HCBP has included Percent Model Affinity, total number of taxa, and number of EPT taxa expressed as a percentage of individuals. The Hilsenhoff Biotic Index has not been calculated as part of the analysis of pre-construction monitoring data for the HCBP; however, this can be incorporated into future monitoring. In addition, the timing of sample collection at the HCBP is consistent with the timing of annual post-construction sampling recommended in the Laurel Creek monitoring program.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - EIR 3rd Addendum Comments	**114**	Note that the study data indicated that (pg 9) during storm events all sites except for station 20 and 21 regularly exceed the suspended solids target of 25 mg/L. This is generally in response to runoff carrying silt and solids from contributing areas. Could this happen in the HCBP and would that impact spawning areas?	During construction of the HCBP, sediment and erosion control measures will be put into place to limit sediment entering the stream as approved by the Grand River Conservation Authority (GRCA). Stormwater management ponds within the HCPB have been designed to an enhanced level requiring 80% Total Suspended Solids (TSS) removal efficiencies as per Ministry of Environment (MOE) Stormwater Management Guidelines (2003). In compliance with the MOE certificates of approval for the HCBP Phase II stormwater management ponds, TSS will be monitored in pond effluent during at least 8 events per year for a minimum of 3 years. As part of a consolidated monitoring program, surface waters in Tributary A will be monitored for TSS and other water quality parameters. This data will be available to the ecological consultants, MOE, the City of Guelph, and GRCA in annual reports for review with respect to TSS impact on stream habitats.	
	115	The trail system along Tributary A1 north of Laird Rd. places it in close proximity to the cold water portions of the creek and brook trout spawning areas (located in earlier 1994 HCWP). Is this an appropriate location so close to the stream? Note the damage that has occurred to streams in other areas of Guelph located near heavily used trails. Damage is noted to be particularly bad from mountain bikes and dogs.	Potential for damage to the stream depends mostly on whether trail users leave the trail and enter the forest via informal trails. This will be addressed with signage to educate trail users. Signs are proposed for all access points to this trail. Regarding distances, the trail and Tributary A1 are separated by at least 40m in all but 1 location. The trail is closest to Tributary A1 near the tile drain outlet at the edge of the main block of forest (north of Laird Rd). At this location they are approximately 15m apart.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - Comments on HCBP EIR #3 - Part One		**Heritage Maple Grove**		
	116	Are the areas that contribute water to the vernal pools protected?	The vernal pools within the grove, and surrounding wooded area are being retained.	Section 3.2 Management Recommendations
	117	Is the kettle pond feature west of the Grove along Forestell Rd including the cottonwood protected? Does it provide breeding habitat? It would make sense to protect it as part of the buffer along Forestell Rd. as it does provide diversity. As well, if it is a kettle feature, it could be over 13,000 years old.	The kettle ponds, including the cottonwood are being retained. The kettle pond may provide breeding habitat for amphibians. Amphibians surveys, including call surveys and salamander surveys were conducted in both of the vernal pools within the grove in spring 2009 and 2010.	
	118	Since the grove will be fenced and gated why cut down hazard trees as they do provide habitat. The tallest dead tree in the grove appears to act as a staging area for migratory birds. I observed a large flock of robins (at least 25-40 birds) this last autumn flying in and perching in this tree as I walked along Forestell Rd to gather apples from the road side tree. If the park is gated and fenced the hazard trees could remain as part of the habitat and if a trail is developed only those that post a risk could be selectively cut. Therefore, no trees should be cut until a comprehensive plan is developed and approved.	Hazard trees are a liability risk as the grove may be utilized by pedestrians. The City of Guelph will take ownership of the grove; therefore, retaining hazard trees will be a liability. Also, from a liability perspective, as certified arborists, it is mandatory that hazard trees be identified and recommended for removal.	
	119	When the grove becomes parkland we would like to see a stewardship committee formed to help with rehab and restoration. Many of the heritage trees have unique features such as unusual bark bridges, "antique bark" and other features that could be easily vandalized. I support the gating and limited access to the grove until such time as a plan is developed in order to protect the trees.	It is agreed that a stewardship committee would be an asset during the buckthorn removal program and woodlot rehabilitation process.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - Comments on HCBP EIR #3 - Part One		**Restoration Plantings**		
	120	I would like to see a greater diversity of native trees especially in the areas to be restored adjacent to the wetland and woodland. Some of these trees are already located in the HCBP such as yellow birch, blue beech, bitternut hickory (there used to be some on Kortright Hills Phase 4 but they were logged), shagbark hickory, lindera benzoin (shrub already on site) for the spicebush butterfly, black walnut, butternut, M coronaria (sweet wild crabapple), American linden, black locust, hop tree, white oak. The mixture of shrubs should also contain more diversity. Other plantings need to contain more milkweed species for the monarch butterfly.	Restoration planting plans include native tree and shrub species that are both hardy and available in large quantities. The recommended seed mixtures currently include a number of species that benefit butterflies and moths (i.e. black-eyed Susan, New England aster, spotted Joe-pye-weed and boneset). Common milkweed can be added to the appropriate seed mixes to encourage monarch butterfly populations. With regard to recommended tree and shrub species, see appended table.	Appended to EIR Package - Tree and Shrub Species Table
	121	Trees on streets to be recommended on site plans.	Planting plans for each development lot are required at the Site Plan Stage.	Section 4.0 Street Tree Planting

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liaison Committee - Comments on HCBP EIR #3 - Part One	**123**	According to a recent Toronto study "Increasing canopy cover in asphalt and other hard surface treatments" by Justin Morgenroth 2005 in which she reviewed the health of trees in asphalt and other paved surfaces she found that; "Other species expressing high proportions of 'Excellent' ratings included: sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), crab apple (*Malus spp.*), little-leaf linden (*Tilia cordata*). These species did not differ significantly from one another with respects to proportion of 'Excellent' ratings. In terms of trees which expressed significantly higher proportion of 'Excellent' or 'Good' trees, Colorado spruce and Siberian elm (*Ulmus pumila*) exceeded all other species. The next group of highly rated trees consisted of sugar maple, red maple, honey locust (*Gleditsia triacanthos*) and white ash. Conversely, the species which displayed the largest proportion of trees with 'Poor' ratings were silver maple (*Acer saccharinum*), crab apple, red oak (*Quercus rubra*) and mountain ash (*Sorbus spp.*). This study may be applicable to the site design of individual lots and suggests that trees will survive when growing in asphalt environments such as playgrounds. Can they also be planted in parking lots to help cool the temperature of the run-off?	Not able to plant white ash due to emerald ash borer, little-leaf linden is a non-native species, Colorado spruce and Siberian elm are non-native species. Plans for each development, outlining proposed landscaping will be required at the Site Plan Stage. It is true that trees may survive within asphalt environments; however, their life span is typically very short, therefore, trees may need to be replaced approximately every 5-10 years. NRSI is currently investigating planting options for street trees and trees within urban environments that will increase their longevity and overall health. If concluded, during the Site Plan Stage, these recommendations will be outlined.	
		Monitoring		
	124	Amphibian monitoring - when mortality checks are carried out on Laird Rd this needs to be conducted at night because during the fall migration of 2008 very few amphibians were noted to be left on the road in the AM versus the hundreds found in the late evening before midnight.	All amphibian surveys are conducted at night (call surveys and road mortality). Surveys begin one half hour after sunset and continue until midnight.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
PLC - Comments on HCBP EIR #3 - Part One	125	Also, should there be an additional monitoring site in the kettle features on the west side of the grove on Forestell Rd.?	In the 2008 Terrestrial and Wetland Monitoring Report, it was recommended that amphibian monitoring be conducted within the Heritage Maple Grove and within the wetland areas associated with Laird Road. Amphibian monitoring was conducted within these areas in spring 2009 and 2010.	Appendix XV - Terrestrial and Wetland Monitoring Report (2008)
	126	I could not find a map with the new monitoring station locations. Should Figure 1 Terrestrial Monitoring Stations be updated to add these new stations? Do the monitoring results in the appendices include the species found at the additional monitoring stations?	It was recommended that additional monitoring stations be added for the 2009 monitoring season. The 2009 Terrestrial and Wetland Monitoring Report will show updated monitoring stations.	Appendix XV - Terrestrial and Wetland Monitoring Report (2008)
Guelph Field Naturalists - Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment (December 13, 2004)	127	Suggest emphasizing significant wetlands and other natural heritage features as a central feature of the new business park. This could be done by changing the name to Hanlon Creek Business Park and Wetlands Preserve (or some other appropriate name) and by appropriate signage throughout the area that emphasizes the importance of these wetlands for clean water supply and for wildlife, and the care that the city takes to manage its environmental responsibilities.	Educational signage will be posted throughout the business park (i.e. at SWM facilities, trail entrances) emphasizing the importance of significant natural features.	
	128	We endorse the Monitoring Plan recommendations of the Hanlon Creek State of the Watershed study which are discussed in the consolidated EIS. We do have concerns over who will do the monitoring both before development and every 5 years afterward.	The City's consultants (AECOM, Banks Groundwater and NRSI) have been conducting annual monitoring of baseline conditions within the Business Park. It has been determined that monitoring as outlined in the Hanlon Creek State of the Watershed is not sufficient to capture site specific information/changes, therefore, NRSI, along with AECOM and Banks Groundwater have worked collaboratively to develop a Terms of Reference for a comprehensive monitoring plan that upon approval by the GRCA and City, will be implemented during construction and post-construction until 2 years after 75% build-out of Phase 1 and 2.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Guelph Field Naturalists - Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment (December 13, 2004)	129	We still believe that removing the roadbed of the closed section of Laird Road through the central wetland area would be the best situation. Constant clearing of woody vegetation along this corridor will continue to impact this area. As well, leaving this roadbed in place will be an invitation to various forms of wheeled traffic both motorized and bicycles which may lead to sustained impacts. We understand the need for secondary emergency access to the eastern private residence. Should this residence be sold to the city at some point in the future, consideration should again be given to removing and rehabilitating the closed Laird Road roadbed.	The City has determined that the section of Laird Rd to be closed no longer needs to be maintained as an emergency access, therefore, the road bed will be removed within this section and restored.	
	130	We also still feel that additional efforts to minimize any intrusion into the woodland by Road 'D' adjacent to Block 25 on the western side of the proposed development are warranted. Moving Road 'D' to the west of the gas easement or simply crossing it further south to avoid intruding into the woodland would maintain the existing stable edge and avoid any loss of trees thereby retaining the existing integrity of the woodland. The intersection of Road 'D' with Downey Road could be adjusted southward. Block 25 would then be smaller in size while Blocks 22 & 24 would be larger resulting in minimal net loss of developable land while maintaining safe road standards.	Details pertaining to Road 'D' will be addressed as part of Phase 3.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Guelph Field Naturalists - Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment (December 13, 2004)	131	We would like the City to adopt some forms of control and/or restrictions on the use of pesticides and fertilizers, road de-icing salt, and other pollutants within the Business Park. Consideration should be given to an outright ban on pesticide use for cosmetic purposes. Encouragement should be given in developing a more naturalized, environmentally friendly landscaping design by business park tenants.	Site Plan recommendations, such as the use of pesticides, fertilizers, salt are addressed in the EIR.	Section 17.0 Site Plan Recommendations
	132	As has happened in other proposed developments within the Hanlon Creek watershed, buffer widths have been reduced from those recommended by the Hanlon Creek Watershed Study. Although the Consolidated EIS is in agreement with most of the recommended buffer widths, areas within Sector 19, 20 and 22 have smaller buffer width recommendations. In the Hanlon Creek Watershed Plan, Section 4.2, Point 7, it states "The buffer areas specified in the plan should be considered to be fixed and subject to only minor modification."	Buffers within the Development plan were reviewed and approved by the GRCA in 2000. The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background
	133	We feel that refinements to buffer recommendations proposed by the EIS are not warranted and not specified by the HCWP. The Plan's specific recommendations were based on the studies of the various components of the watershed undertaken by the Plan's consultants. We feel that recommendations in the HCWP should supersede those of the GRCA as those of the Plan are site specific to the Hanlon Creek watershed and were developed under guidance of the Study Team which included the GRCA.	Buffers within the Development plan were reviewed and approved by the GRCA in 2000. The Development plan was also reviewed and approved by the Ontario Municipal Board (OMB) in November 2006.	Section 1.7 Background

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Guelph Field Naturalists - Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment (December 13, 2004)	134	We have several concerns with respect to data found in the Consolidated EIS.	Annual monitoring that has occurred since 2006, includes a listing of species, both vegetation and birds, observed within each monitoring plot, which allows a comparison of species observed within certain ELC communities.	Appendix XIII, XIV and XV - Terrestrial and Wetland Monitoring Reports (2006-2008)
		a) No separate listing of species is given for each Ecological Land Classification (ELC) unit. Without this information, the location of significant species isn't known and predictions on the impacts or loss of significant species can't be made. For example, will the intrusion of Road 'D' into the woodland at the western edge of the proposed development affect any significant species?		
	135	b) The Consolidated EIS lists 24 species of birds that are considered significant. However, Table 4 (pg.29) lists 25 significant species. The EIS provides no discussion on the anticipated impacts of development on these significant bird species nor does it provide information on where these species were located. Will the habitat of any of these species be destroyed or altered by the proposed development? Further consideration of significant bird species possibly affected by the proposed development appears to be warranted.	Green heron (*Butorides virescens*) in Table 4 is inappropriately bolded as it was not observed within the study area from 1998 - 2004, therefore, 24 significant bird species were observed, not 25. A provision of habitat types utilized by the significant bird species are being retained within the Development Plan, including open meadow, wetland and woodland.	Section 5.0 Buffer Design and Restoration Plantings
		c) Table 2, Uncommon Plants in the Study Area, in the Consolidated EIS contains 2 species that are not found in Appendix II, Plant Species Recorded from the Study Area, of the same report: *Cypripedium reginae* and *Ledum groenlandicum*. Which of the two lists are correct?	The list of species provided in Table 2 is correct.	

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Guelph Field Naturalists - Draft Plan of Subdivision, Official Plan Amendment and Zoning By-law Amendment (December 13, 2004)	**136**	Although no recent published local or regional authority for Wellington County or the City of Guelph currently exists for plant species rarity status, nearby municipalities do have recognized lists of significant plants. It is reasonable to assume that species significant regionally or locally is indicated by significance in surrounding municipalities. This being the case, then there are 18 plant species lists in Appendix II that are significant. The Consolidated EIS provides no information on the location of these species nor does it provide any discussion. We are, therefore, concerned that the impacts of the proposed development on these species has not been taken into account. Will habitat for these species be destroyed or altered? How vulnerable are these species to the impacts from development?	Since the Consolidated EIS (2004), the Guelph Natural Heritage Strategy (2009) has been developed that outlines regionally significant flora and fauna species within Wellington County. The Natural Heritage Strategy was approved by Council in July 2009. The Natural Heritage System policies are draft and will be incorporated into the Official Plan update. Based on the NHS species lists, of the 18 species referenced by GFN, 3 of these species are considered regionally significant; *Lycopodium clavatum, Elymus riparius* and *Solidago patula*. *Lycopodium clavatum* prefers open woods, grassy thickets and bog margins, *Elymus riparius* is found along stream banks and *Solidago patula* can be found in wet meadows and swamps. The proposed development is retaining/enhancing the habitat features necessary for these regionally significant species, therefore, they will not be impacted by the development.	
	137	We would like to see a recommendation that states that every attempt will be made to retain the small wooded area along Forestell Road in the southeast corner of the proposed development, and include it within the new landscaping plans of Block 39.	The Heritage Maple Grove (woodlot along Forestell Road) is being retained with naturalized buffers.	Section 3.0 Heritage Maple Grove

Source of Comment	#	Nature of Comment	Response	EIR Reference (NRSI February 2009)
Public Liason Committee - Commens Re Information Package for HCBP (March 2010)	138		For comments and responses related to this document, refer to Response Comments to PLC.	Appended to EIR Package - Response Comments to PLC

Tree and Shrub Species Table

Table 1. Tree and Shrub Species

Common Name	Scientific Name	Comment
Yellow birch	*Betula alleghaniensis*	Is already recommended within current planting plans
Blue beech	*Carpinus caroliniana ssp. virginiana*	Won't do well as a restoration species as it requires saturated areas and may not do well in full sun as it generally requires established canopy cover.
Bitternut hickory	*Carya cordiformis*	Can be added to restoration plans.
Shagbark hickory	*Carya ovata var. ovata*	Not known from study area. Site too far north for it to do well.
Spicebush	*Lindera benzoin*	Is a Carolinean species, no historic record of this species within Wellington County. If planted, requires swamp-like conditions and canopy cover.
Black walnut	*Juglans nigra*	Allelopathic species. Not condusive to restoration goals.
Butternut	*Juglans cinerea*	It is not recommended that significant species be utilized in restoration plans. The use of common species known to occur within the site is advised. In the event that butternut was planted, it is necessary to go through the local MNR for approval, as well, the location of each butternut planted would need to be well documented as it wouldn't be protected under the Species at Risk Act.
Sweet wild crabapple	*Malus coronaria*	The native species is known to hybridize with non-native species, therefore, not suitable for native restoration goals.
American linden (basswood?)	*Tilia americana (?)*	Assume referring to basswood, which is a native species. Basswood is recommended within current planting plans.
Black locust	*Robinia pseudo-acacia*	Black locust is a non-native, invasive species.
Hop tree	*Ptelea trifoliate*	Is a species at risk and is also a Carolinean species that doesn't occur within the study area.
White oak	*Quercus alba*	Can be added to restoration plans as it is known from the study area.

Recommended Site Plan Checklist

Hanlon Creek Business Park – Recommended Site Plan Checklist

Site Plan Recommendations Specific To HCBP	Task Completed		
	Yes	No	N/A
Sediment and Erosion Control			
Sediment and erosion control plans installed prior to all site works.			
Sediment and erosion control plans installed prior to and maintained during construction.			
Heavy-duty silt fencing identified on site plans adjacent to natural heritage features and stormwater management facilities, including conveyance swales			
All cleared and/or graded areas (bare soil) not built upon within 30 days is seeded with recommended native seed mix as outlined in tend documents.			
Existing areas of natural vegetation associated with recommended trail layout retained where possible.			
Trees and other areas of vegetation to be retained are identified and delineated with temporary fencing located beyond the dripline to ensure that vehicle movement or material storage does not disrupt vegetation (especially root zones).			
Any limbs or roots to be retained which are damaged during construction are pruned using appropriate arboricultural techniques.			
Maintenance of machinery during construction is occurring at a designated location away from the natural features on-site.			
Restoration planting plans are installed with the recommended locations outlined in the restoration tender documents to maximize protection of these features from erosion, as well as unauthorized entry.			
No equipment, material or fill being stored within the natural areas.			
Hazard trees are identified and removed as warranted during the installation of construction limit fencing.			
Topsoil stockpile locations have been identified that take into account the natural features and functions described in the Consolidated EIS and EIR.			
Sediment and erosion control measures (i.e. heavy-duty paige wire fencing) is identified and implemented for topsoil locations.			
A qualified Environmental Inspector, satisfactory to the Director of Community Design and Development Services, has been hired to inspect the site during all phases of development and construction, including grading, servicing and building construction.			
Environmental Inspector shall monitor and inspect the erosion and sediment control measures and procedures, compliant with the Consolidated EIS and EIR on a weekly or more frequent basis if required.			
Environmental Inspector to report findings to the City on a monthly, or more, frequent basis.			
Dust Suppression			
Dust suppression control plans submitted for all site works.			
Areas of bare soil moistened with water during all construction activities to ensure amount of dust within study area is reduced.			
Topsoil stockpile locations identified and placed in areas of lesser wind exposure, away from natural features.			
Pesticide and Chemical Usage			
No person shall apply or cause, or permit the application of a pesticide within			

the boundaries of the City of Guelph (City of Guelph 2007).			
Pesticide by-law adhered to during site plan stage and up to occupancy.			
Document outlining chemicals to be used by industry that may pose a potential threat to groundwater.			
Spill prevention and contingency plans (to be located at front door of industry).			
Salt			
When possible, sand applied to areas that require de-icing.			
Management practices adopted and in practice, such as pre-wetting, anti-icing techniques, employee training on best practices and salt chemistry and identification of priority areas.			
Tree Retention and Landscape Plantings			
Detailed lot layout grading plan compared to trees identified for retention to assess feasibility of retention.			
Retain existing areas of natural vegetation wherever possible.			
Trees and other areas of vegetation within the natural areas and along the proposed trail network being retained are identified and delineated with temporary fencing beyond dripline of trees to ensure vehicle movement or material storage does not disrupt vegetation (especially root zones).			
Temporary fencing placed around trees of significance along proposed trail system to retain and protect.			
Any limbs or roots of trees being retained that are damaged during construction are pruned using appropriate arboricultural techniques.			
Educational signage posted throughout business park that provides protective covenants for natural features and restoration areas.			
City reviewed trees of high hazard on lands under their ownership to determine long-term management.			
Restoration planting plans implemented at earliest possible point in Site Plan process.			
Landscape guide provided to developers to ensure plantings installed properly.			
Lot-level landscape plans prepared at Site Plan stage. Plantings include: - Native vegetation species - Locally sourced seed, tree and shrub stock for naturalized plantings			
Lighting			
Detailed lighting designs provided at Site Plan stage.			
Lighting designs include directional lighting for all areas of road developments that are within 30m of the natural heritage features or adjacent to existing residential dwellings to eliminate lightwash.			
Each developer of lands adjacent to Highway 6 (Block 10, 11, 12, 17, 18 and 19) shall submit to the Ministry of Transportation for their review and approval of an illumination plan, prepared by a qualified consultant, indicating the intended treatment of the site lighting glare.			
Snow Storage			
Snow storage areas identified on Site Plans in a location at least 30m from wetland features and 10m from woodlot areas. Storage areas take into account the natural features and functions described in the Consolidated EIS and EIR.			
The following principles adhered to when areas chosen and functioning: - Locate and operate snow disposal areas to minimize impacts to natural environment. - Clearly delineate actual snow disposal areas in a manner that is clearly identifiable under adverse winter conditions to ensure snow is placed in the proper location. - Manage meltwater discharge to comply with City of Guelph water quality regulations and protect surface and groundwater resources. - Collect and dispose of on-site litter, debris and sediment from			

meltwater that settles in areas in accordance with City of Guelph waste management legislation. - Control emissions (drainage, noise, dust, litter and fumes) to prevent on and off-site environmental impacts. - Snow handling, storage and disposal design must not impose undue maintenance requirements.			
Maintenance and Refuelling Areas			
Maintenance and refuelling areas are **NOT** permitted within 30m of natural features.			
Site specific location designated at Site Plan stage.			
Minor grading may be required outside of the 30m to ensure maintenance and refuelling is directed away from natural features and located a minimum of 30m from natural features.			
Stormwater Management Ponds and Swales			
Erosion and sediment control measures provided during construction period.			
Controls such as silt fencing, temporary storage areas, straw bale dykes, stone check dams and catch basin treatments, etc. implemented.			
Disturbed landscape areas not subject to construction activities covered in topsoil, fine graded and seeded immediately following earthworks operation.			
Temperature monitoring carried out during and after construction to ensure post-development temperatures suitable for brook trout.			
Monitoring occurring within stormwater ponds and the stream to identify function of each mitigation element in the system (bottom draw, cooling trench, increased vegetative cover).			
Monitoring of fish and benthic invertebrates being carried out to determine whether any changes occurring in suitability of habitat for brook trout.			
Additional mitigation measures as outlined in Consolidated Monitoring Report implemented if temperatures not within range for brook trout and/or fish and benthic invertebrates appear to be stressed due to temperature conditions.			
Low Impact Development (LID) measures should be considered, installed and maintained in good working order to meet infiltration targets.			
Water-balance analysis demonstrating that target infiltration rates set out in EIR for property covered by Site Plan approval is met.			
Approval of water-balance analysis and relevant mapping.			
Laird Road			
Installation of subsurface utilities prepared and reviewed by a qualified ecologist or biologist for potential impacts to neighbouring wetlands and watercourses.			
Using trench technology for installation of subsurface utilities so no direct disruption of vegetation.			
Sediment and erosion control measures implemented and maintained throughout construction period.			
Restoration plans recommended in HCBP Phase 3 EIR/Tender package implemented upon closure of Laird Road.			
Subsurface Watermains and Sewers			
Use of granular backfill for subsurface pipes to create a conduit for groundwater flows.			
All subsurface pipes installed in areas of high groundwater levels include cut-off collars to prevent impacts to groundwater flow patterns.			
Road A Crossing of Tributary A			
Conditions of permit as issued by GRCA/DFO are implemented and monitored as per permit(s).			
Implement restoration plans as outlined in Tender package.			
Downey Road Watercourse			
Implement restoration plans as outlined in Tender package.			
Conditions of permit as issued by GRCA/DFO are implemented and monitored			

as per permit(s).			
Lands Adjacent to Heritage Maple Grove			
To be implemented prior to site grading: - Sediment and erosion control measures installed prior to, and maintained during construction. - Areas of bare soil re-vegetated within 30 days of being cleared to prevent erosion of soils and gullying. - Trees and other areas of vegetation to be retained identified and delineated with temporary fencing located beyond the dripline of trees, to ensure vehicle movement or material storage does not disrupt vegetation (especially root zones). - Any limbs or roots to be retained that are damaged during construction are pruned using appropriate arboricultural techniques. - Maintenance of machinery during construction occurring at a designated location away from the Heritage Maple Grove. - No storage of equipment, material or fill is occurring within the Heritage Maple Grove. - Hazard trees identified by a Certified Arborist and removed as warranted during installation of construction limit fencing. - Signage installed on the fencing to identify Heritage Maple Grove as a tree retention area. - 3:1 slope re-vegetated as per recommendations in EIR/Tender package.			
Management guidelines for Heritage Maple Grove as per the City of Guelph: - Identify hazard trees within the grove inspected by a qualified City staff person or designated Certified Arborist, to determine the need for hazard tree management (pruning, removal etc.). - City has prepared and implemented an invasive species removal program (especially for common buckthorn (*Rhamnus cathartica*). - Heavy-duty paige wire fence installed around perimeter of Heritage Maple Grove to provide additional protection.			
Noise and Vibration Assessment			
Noise and vibration assessment reports for development on the northerly Block 2, 3, 9, 10 and portion of Block 11 north of Road A to confirm that the proposed use, activity and development, in hand with the proposed zoning restrictions and regulations, meets the Ministry of Environment noise and separation distance guidelines.			
Noise and vibration assessment reports for development on the southerly half of Blocks 20, 31, 32, 36 and 37 and southerly half of Block 28 to confirm that the proposed use, activity and development, in hand with the proposed zoning restrictions and regulations, meets the Ministry of Environment noise and separation distance guidelines.			
All proposed development shall be subject to the Ministry of Environment noise/vibration guidelines, standards and requirements in force at the time of execution of agreement.			

Hanlon Siting Protocol and Factsheets

Hanlon Creek Business Park
Wildlife Survey and Sighting Response Protocol

Prepared for:

City of Guelph
1 Carden Street
Guelph, ON
N1H 3A1

Project No. 726

Date: May 28, 2010

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Head Office: 50 Westmount Rd. N., Unit 230, Waterloo, Ontario, N2L 2R5 **Tel:** (519) 725-2227 **Fax:** (519) 725-2575 **Web:** www.nrsi.on.ca
Sault Ste. Marie: 111 Elgin Street, Unit 201, Sault Ste. Marie, Ontario, P6A 6L6 **Tel:** (705) 253-0620 **Fax:** (705) 253-0670 **Email:** info@nrsi.on.ca

1.0 Introduction

Natural Resource Solutions Inc. has prepared a Sighting Response Protocol and Presence/Absence Survey Protocol to address the possibility of encountering Species at Risk (SAR) and common wildlife species during the construction phase of the Hanlon Creek Business Park (HCBP).

The eastern milksnake (*Lampropeltis triangulum triangulum*) and common snapping turtle (*Chelydra serpentina serpentina*) are currently listed as Species At Risk, both federally and provincially. As both species are known to occur within the HCBP study area, and as a result of their sensitive populations within Ontario, NRSI has prepared the following survey and sighting response protocol.

Prior to the on-set of any construction activities, the following document, along with detailed fact sheets specific to eastern milksnake, common snapping turtle and other wildlife species known to occur within the study area will be circulated to all staff involved in on-site activities. This information package will include representative photos, habitat descriptions, size characteristics, and other important identifying features. All on-site staff members should be familiar with these identifying characteristics and should be aware of the proper protocol should a suspected SAR be encountered.

2.0 Sighting Response Protocol

In accordance with the Species At Risk Act (SARA), no rare species can be handled or relocated without the proper approvals and permitting from the Ministry of Natural Resources. A precautionary permit is typically not available to allow for handling and relocation of rare species, but may be provided following the initial sighting of a particular species. Upon the first encounter of an eastern milksnake or common snapping turtle, the Guelph District MNR Species at Risk Biologist(s) will be contacted. Following the initial involvement of the MNR, permits may be provided to allow for trained staff to undertake relocation of the identified species, if necessary.

Following the initial SAR encounter, and assuming NRSI obtains any necessary permits from the MNR, the following protocols are proposed:

2.1 Eastern Milksnake

In hedgerow habitats, a trained biologist from Natural Resource Solutions Inc. will be present during any proposed hedgerow crossing, or other areas of woody vegetation removal. At these locations, a biologist will undertake a comprehensive presence/absence survey looking for the eastern milksnake. These surveys will involve detailed searches of hedgerow habitat and will be timed to occur as close to the construction activities as possible, occurring on the same day as the proposed construction activities and vegetation removal. The habitat will be searched in detail, including under possible basking features and in rock crevices, if present. If the eastern milksnake is encountered, a trained biologist (with appropriate permitting and/or documentation) will transfer the specimen to a location in the same hedgerow, if possible, to a distance of between 100-300m from the area proposed for construction activities. Following the biological survey, construction activities will be permitted in the designated area. If this species is observed during construction activities, all work at this location will be halted and a trained biologist will be called to return to the site and document the sighting and oversee the remainder of construction activities at this location.

In agricultural settings and fallow fields, where biologists will not be present to examine the habitat during construction activities, the following protocol is proposed:

During construction activities, if a known or suspected eastern milksnake is encountered, construction activities at that location will immediately be halted. On-site staff should examine the area for any signs of dens, burrows, or other indications that this animal may be residing at this location. If no signs are identified and the animal has successfully left the immediate construction area, construction activities can be resumed. If signs indicate that this may be a resident animal, or the animal is not vacating the area, a trained biologist should be contacted to further document and/or inspect the surrounding area. This biologist should also be present when construction activities resume to ensure the animal is protected from any impact.

In addition to specific surveys proposed by Natural Resource Solutions Inc., all on-site staff should conduct routine inspections of any heavy machinery, or other vehicle, that is left unattended in potential milksnake habitat. These routine inspections should occur if a vehicle has been unattended for more than 30 minutes, and should focus on warm and partially protected areas of vehicles including under the hood, wheel wells, and on the ground under the machinery. These areas surrounding the vehicle provide warm habitat that may provide preferred basking habitats for snake species.

2.2 Common Snapping Turtle

In wetland habitats, a trained biologist from Natural Resource Solutions Inc. will be present during any proposed works in and around wetland habitats, other wet areas (i.e. ponds, slow streams, river edges) or areas of disturbed soils and gravel where snapping turtles are occasionally known to nest. At these locations, a biologist will undertake a comprehensive presence/absence survey looking for common snapping turtle. These surveys will involve detailed searches of wetland habitat/disturbed soil and gravel areas and will be timed to occur as close to the construction activities as possible, occurring on the same day as the proposed construction activities and vegetation/wetland removal. The habitat will be searched in detail, including surrounding wetland vegetation, possible basking features and mud within pond bottom, if present. If the common snapping turtle is encountered, a trained biologist (with appropriate permitting and/or documentation)

will transfer the specimen to an appropriate wetland location within the business park, a distance of between 100-300m from the area proposed for construction activities. Following the biological survey, construction activities will be permitted in the designated area. If this species is observed during construction activities, all work at this location will be halted and a trained biologist will be called to return to the site and document the sighting and oversee the remainder of construction activities at this location.

In agricultural settings and fallow fields where biologists may not be present to examine habitat during construction activities, the following protocol is proposed:

During construction activities, if a known or suspected common snapping turtle is encountered, construction activities at that location will immediately be halted. On-site staff should examine the area for any signs of dens, burrows, or other indications that this animal may be residing at this location. If no signs are identified and the animal has successfully left the immediate construction area, construction activities can be resumed. If signs indicate that this may be a resident animal, or the animal is not vacating the area, a trained biologist should be contacted to further document and/or inspect the surrounding area. This biologist should also be present when construction activities resume to ensure the animal is protected from any impact.

2.3 Other Wildlife Species

A number of other wildlife species, not listed as Species At Risk by the Ministry of Natural Resources, are also known to occur within the study area. These species may include, but are not limited to:

- American toad (*Bufo americanus*),
- Western chorus frog (*Pseudacris triseriata*),
- Midland painted turtle (*Chrysemys picta marginata*),
- Blue-spotted salamander (*Ambystoma laterale*),
- Eastern gartersnake (*Thamnophis sirtalis sirtalis*),
- Muskrat (*Ondatra zibethicus*)

During construction activities, on-site staff is to take precautions with respect to all wildlife species. The following measures are to be taken if wildlife species are encountered:

- be aware of wildlife during construction activities,
- do not harass or harm wildlife species,
- contact Environmental Inspector if there is a concern about the significance of species observed,
- move species away from construction zone into nearest natural area (i.e. wetland, woodland),
- if unsure of where to move species, contact the trained biologist or Environmental Inspector for guidance

3.0 Reporting

All rare species sightings by any person participating in the on-site activities, including the biologist when present, will be recorded in a designated binder that will be located in the on-site mobile office, or other centrally accessible location available to all staff. Species at Risk sightings are to be documented as soon after the observation has occurred as possible, always being recorded on the same day of the observation. Information recorded will be consistent with the details required by the Natural Heritage Information Centre (NHIC) to ensure that all rare species are appropriately documented. A sample table is appended to this document.

In addition to the response protocol put in place for on-site workers, detailed forms will be filled out by the surveying biologist each time a rare species is documented. Photos will be taken (if possible), and identifying marks will be recorded, for each rare species observed by the biologist.

During the initial stages of construction, all eastern milksnake and common snapping turtle sightings will be reported to the appropriate MNR staff. After a period of time, determined by the MNR, weekly or monthly reports provided by NRSI may be sufficient to document the encounters during the construction period at the Hanlon Creek Business Park. This information will be presented in a short memo format and will summarize the numbers of species, locations, and actions taken during the previous month. Completed rare species sighting tables, photos, and any other applicable information will be appended to these memos for the review of the MNR.

All crew members will be required to read through, and sign off on these sighting response protocols prior to engaging in any land alteration activities indicating that they have read, understand, and will follow this sighting response protocol. Sighting response protocol will be implemented throughout the entire year; however rare species presence/absence surveys by a trained biologist will apply only for construction activities proposed from April 15th through November 1st when a majority of species may be present and/or active in these areas.

APPENDIX I

Species At Risk Sample Sighting Table

Date	Time	Species	# of Animals	Location	UTM Coordinates	Staff Name and Position (please print)	Action Taken
July 15/10	1:20pm	Eastern Milksnake	1	Tributary A	17T 111111 1111111	(Biologist)	Snake transferred 200m north within the same habitat

Appendix II

Eastern Milksnake and Snapping Turtle Identification Sheet

Hanlon Creek Business Park
Protecting Species of Special Concern during Construction

WATCH OUT FOR:

SNAPPING TURTLES

Species at Risk in Ontario Rank: Special Concern
COSEWIC Rank: Special Concern

- Size: Average length of **20-36 cm** and a weight of **4-16 kg**
- Colour: Upper shell is **brown, black, or olive** with three longitudinal ridges, and often algae covered
- Other descriptors: Small lower shell, **long tail**, thus not able to pull head, tail and limbs into their shells for protection. This is why they may bite when threatened.
- Where are you likely to find: slow-moving **freshwater** with a soft mud bottom and dense aquatic vegetation, also nest on **gravel shoulders**, construction sites, embankments

EASTERN MILKSNAKE

Species at Risk in Ontario Rank: Special Concern
COSEWIC Rank: Special Concern

- Size: Average length is **60-90 cm**
- Colour: Large **reddish-brown blotches with thick black outline**, typically on a gray, tan or white background
- Other descriptors: The head is somewhat indistinct from the neck, and the body is **slender** and nearly the same diameter for its entire length
- Where you are likely to find: **Farmlands, forested areas, wetlands, downed woody debris**, as well as in and around barns, sheds and houses, prefers heavily forested areas over low forest cover

BEFORE STARTING CONSTRUCTION, ENVIRONMENTAL INSPECTOR WILL:

- **Carry out presence/absence survey,**
- **Move species from construction areas to habitat areas,**
- **Direct construction work to proceed**

IF SNAPPING TURTLES/MILKSNAKES ARE FOUND DURING CONSTRUCTION:

- **do not harass or harm the species,**
- **contact Environmental Inspector to transfer animal to nearest natural area (i.e. wetland, woodland),**
- **contact Environmental Inspector if there is a concern about the significance of any species observed.**

CALL: Natural Resource Solutions Inc., Environmental Inspector: (519) 725-2227

Appendix III

Wildlife Species Identification Sheet

Hanlon Creek Business Park
Protecting Wildlife Species during Construction

Amphibians

Blue-Spotted Salamander (*Ambystoma laterale*)

- Size: Between 7 – 14 cm in length
- Colour: Skin is bluish-black, with characteristic blue and white flecks on its back and bluish-white spots on the sides of body and tail
- Where you are likely to find: Under logs or other forest debris near breeding ponds in the spring and fall; otherwise, live underground or in ponds

Western Chorus Frog (*Pseudacris triseriata*)

- Size: Small and slender, grow to a length of 2 – 4 cm
- Colour: Dorsal skin ranges from grey to brown, reddish, olive or green , with three dark longitudinal or broken stripes down back and underside is a light cream colour with a few dark spots on throat and chest
- Where you are likely to find: Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture

American Toad (*Bufo americanus*)

- Size: Medium-sized and stocky, grow to a length of 5 – 9 cm
- Colour: Body covered with brown “warts” and numerous dark blotches, behind each eye is a kidney-shaped poison gland
- Where you are likely to find: Mainly terrestrial and found in a variety of habitats, from urban yards and gardens to heavily forested areas

Reptiles

Midland Painted Turtle (*Chrysemys picta marginata*)

- Size: Between 10 – 25 cm in length
- Colour: Smooth, olive-green carapace, with red line patterns on outer edges, and head, neck, and tail have yellow stripes
- Where you are likely to find: Slow-moving rivers, ponds, and marshes with soft bottoms and half-submerged logs and rocks for basking

Eastern Gartersnake (*Thamnophis sirtalis sirtalis*)

- Size: Usually 45 – 66 cm in length
- Colour: Distinguished from other species by the presence of three yellow longitudinal stripes down a dark body, and belly is white or light yellow
- Where you are likely to find: Moist areas, stream and swamp borders, bogs or marshes; wood edges or fencerows and vacant lots

Mammals

Muskrat (*Ondatra zibethicus*)

- Size: Adults are 48 – 60 cm long
- Colour: Overall silvery-brown to dark brown with chestnut sides and gray under parts; fur is oily and waterproof, tail is hairless and flattened vertically, and hind feet are partially webbed
- Where you are likely to find: Slow-moving, deep water bodies, where they build dens in sides of embankments sometimes with multiple underwater entrances/exits

<u>WHAT TO DO BEFORE AND DURING CONSTRUCTION:</u>

- **Be aware of wildlife during construction activities,**
- **Do not harass or harm wildlife species,**
- **Contact Environmental Inspector if there is a concern about the significance of species observed,**
- **Move species away from construction zone into nearest natural area (i.e. wetland, woodland),**
- **If unsure of where to move species, contact Environmental Inspector for guidance**

CALL: Natural Resource Solutions Inc., Environmental Inspector: (519) 725-2227

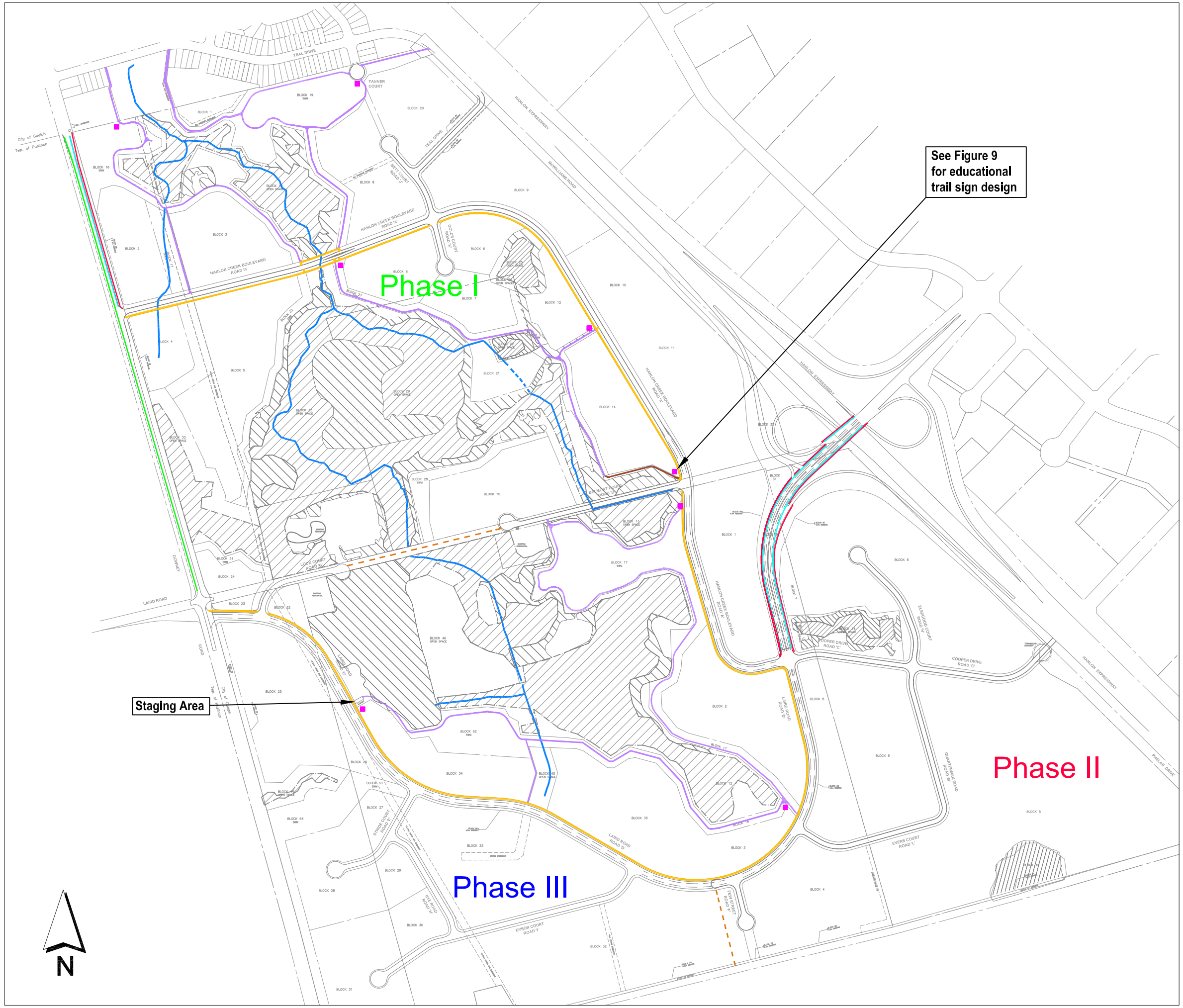
HCBP EIR – Revised Figures

Hanlon Creek Business Park
City of Guelph

Environmental Implementation Report

April 2010
Project 0726
Universal Transverse Mercator - NAD83
Scale 1:8000 @ (11x17")

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists



Legend

- Multi-use Trail (Asphalt surface)
- Off-road Trail (Limestone screenings)
- Off-road Trail (Woodchip Surface)
- On-road Bike Lane (Asphalt surface)
- 1.5 m wide Bike Route
- Possible Future Off-Road Trail
- Proposed Sidewalk (Concrete)
- Educational Trail Sign
- Existing Upland Woodlot
- Provinclally Slgnlficant Wetland
- Watercourse
- Enclosed Watercouse

Base layers from AECOM received January 21, 2009 (X-prlegal, X-prroad)

Figure 8

Pedestrian and Open Space Trail System

NRSI_0726_Hanlon_Trails_2010_05_05_GCS.dwg

Figure 2

Hanlon Creek Business Park

Surface Water Monitoring Stations

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

August 12, 2010
Project: NRSI-0726
Scale: 1:8,500 (11 x 17")
UTM Zone 17 NAD83

N

SWM Pond #1
SWM Pond #2
SWM Pond #3
SWM Pond #4
SWM Pond #5
SWM Pond #6

Tributary A
Tributary A1

HC-A(14)
HC-P2(07)
HC-P2(04)
HC-P2(01-03)
HC-P1(06)
HC-P1(07)
HC-P1(01-03)
HC-P1(04)
HC-P1(05)
HC-P1(08)
HC-A(13)
HC-A(12)
HC-P2(06)
HC-P2(05)
HC-A(11)
HC-A(10)
HC-A(08)
HC-A(09)
HC-A(07)
HC-P3(05)
HC-P3(04)
HC-P3(01-03)
HC-A(06)
HC-A(05)
HC-A(04)
HC-P4(04)
HC-P4(01-03)
HC-P4(05)
HC-P4(06)
HC-A(03)
HC-A(02)
HC-P5(06)
HC-P5(01-03)
HC-A(01)
HC-P5(05)
HC-P5(04)

Legend

- Temperature Monitoring Station
- Temperature and Depth Monitoring Station
- Flow Monitoring Station
- Temperature, Turbidity and Depth
- Development Block Boundary
- Watercourse
- Enclosed Watercourse

0 100 200 300 Metres

561400 561600 561800 562000 562200 562400 562600 562800 563000 563200 563400 563600 563800 564000 564200 564400 564600

4816400 4816200 4816000 4815800 4815600 4815400 4815200 4815000 4814800 4814600 4814400

NRSI_0682H_SurfaceWaterMonitoring_Fig2_8K_2010_08_12_SWM

Public Liaison Committee (PLC) Response Tables

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
1	That no sanitary sewer is routed along the old Laird Road right-of-way	Sanitary sewer is required on the portion of old Laird Road that is to remain open (from Hanlon Creek Boulevard to Block 15). No sanitary sewer is proposed on Laird Road west of Block 15.	How will you ensure that the sanitary sewer and trenching will not impact or intercept local groundwater flows?	The design includes clay seals every 100m where the trench penetrates the watertable to prevent migration of groundwater through the bedding.
2	That any watermain routing along old Laird Road be undertaken by tunneling to limit impacts on the wetland and watercourse and that the depth of the watermain should allow for the eventual removal of the road bed.	It was proposed to install the watermain crossing of Tributary A using trenchless construction techniques. The use of trenchless techniques and the depth of the watermain for the remainder of the watermain construction on old Laird Road will be reviewed for feasibility and costs with the City Engineering Department prior to tendering.	Does this mean that cost will be the primary consideration in determining whether the trenchless techniques will be used or not? What is more important - the protection of the existing ecosystem or cost?	Cost is a factor that needs to be considered versus the benefit of using trenchless construction. For example, if the road bed is being removed and the roadway area is being disturbed, there would be very little benefit of using trenchless methods to install the watermain.
4	That interim mitigation measures be employed to limit amphibian crossing until the closure of the old Laird Road.	NRSI, the City and MNR have worked to develop appropriate interim mitigation measures to limit amphibian movement across Laird Road until closure.	The fence has already blown down in some sections and needs repair.	To reduce road mortality of mammals along Laird Road, discussions were held between NRSI, City and MNR staff to determine options for reducing mammal road mortality along Laird Road. Through these discussions it was determined that fencing be lowered in areas opposite open driveways to allow easier passage for medium to large sized mammals.

Comments re Agency and Environmental Group EIR Comment Table				
#	Nature of Comment	Response from EIR Comment Table	PLC Question/Comment	Response
4			How do the NRSI biologists expect the amphibians to cross the road in their migrations when there are very few gaps in the fencing? Do they know that the gaps are in the right spots on the road?	Pitfall traps were installed along the Laird Road fencing to capture amphibians moving across the road. NRSI biologists have been on-site daily since March 13, 2010 to transport any amphibians across Laird Road in their intended migration direction.
			Where is this fence channeling the migration to? As well I am concerned that the gaps will actually concentrate the number of amphibians moving across the road and increase road kill.	The fencing is not intended to channel amphibian migration. The fencing is intended to be an interim mitigation measure that will block amphibians from crossing Laird Road. Amphibians are being transported across the road by NRSI biologists on a daily basis from March 15th the end of June.
			What has happened to the amphibian tunnels EAC requested?	In fall 2009, locations for wildlife culverts were recommended based on road mortality surveys conducted by NRSI biologists in spring 2009. After review of the proposal, MNR staff had the following comments on November 2, 2009:

Comments re Agency and Environmental Group EIR Comment Table				
#	Nature of Comment	Response from EIR Comment Table	PLC Question/Comment	Response
4				*Given that salamanders can exhibit an aversion to culverts, we are worried that installing the culverts prior to the habitat use study may alter current natural movement patterns of salamanders across the road, therefore leading to false results during the pond surveys and habitat use study. Consequently, MNR does not recommend installing these new culverts at this time. We note that this may be a mitigation measure that can be considered once both studies have ended.*
				We agree that fencing along Laird Road will prevent amphibian road-crossing, hopefully reducing the number of animals killed by traffic. We also agree that installing pitfall traps along the fence is the best way to capture animals headed for the road, and will hopefully yield data as to whether or not salamanders cross Laird Road whether heading north or south.

Comments re Agency and Environmental Group EIR Comment Table				
#	Nature of Comment	Response from EIR Comment Table	PLC Question/Comment	Response
4				By way of information obtained from the 2009 Laird Road mortality surveys and 2010 Laird Rd amphibian surveys, wildlife culvert locations will be recommended. Culverts will be installed along Laird Road prior to the 2010 fall amphibian migration period.
5	That wildlife/amphibian crossings be considered as part of the design for the new Laird Road in Phase 3.	Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.	When will the design for Phase 3 take place and when will it be built?	Design will take place in 2010 and 2011. Construction schedule is unknown but likely to be 2 to 5 years later.
12	That additional plantings including tree species be provided along the Downey channel to maximize cooling - with input from Union Gas.	Union Gas requests that no tree or shrub species be planted within the Union Gas easement to allow for maintenance access and avoid potential impact to gas main.	If you can't plant trees or shrubs how will you cool this portion of the stream?	The gas easement does not impact a large portion of the potential planting area (portion of east side), therefore, restoration plans still include a dense cover of tree, shrub and herbaceous species along the Downey channel.
			Will this portion of the stream receive any stormwater?	None from the developed blocks.
			If you can't cool this portion of the stream how will this impact your modeling of the post development stream temperatures? i.e. will it increase the temperature? Has the modeling been calibrated to take the impact into effect?	Restoration plans include planting of tree, shrub and herbaceous species along the Downey channel, thus mitigating stream temperatures.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
14	That retention or creation of habitat connectivity, corridor/linkage from the central wetland/woodland area to the heritage maple grove, and to habitats south of Forestell Road be implemented as part of Phase 3.	A corridor/linkage from the central wetland/woodland to the Heritage Maple Grove and habitats south of Forestell Rd. will be implemented within Phase 3.	Has this requirement been added to the TOR for Phase 3?	Yes
17	That LID measures be considered at site plan approval stage.	LID measures will be considered at the Site Plan Stage.	What is a LID measure?	LID is the acronym for Low Impact Development. Typical measures include the use of bio-swales, infiltration galleries and stormwater cooling measures. There are numerous other measures that can be considered at the building site planning stage.
			If it is needed is it on the site plan checklist?	Requirement for LID measures will be included in the Site Plan Checklist.
19	The watermain installation on Laird Road should avoid the amphibian breeding season.	Prior to any construction works commencing, it will be recommended that the watermain installation occur outside of the amphibian breeding season.	Has this been tendered yet?	No.
			When is the amphibian breeding season?	Amphibian breeding season begins in approximately late March/early April (pending weather conditions) and ends in mid to late June.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
23	Mitigation Measures recommended in the EIR should be employed in the interim to reduce amphibian mortality.	Barrier fencing, as recommended by NRSI and MNR was installed in November 2009 to ensure mitigation measures are in place for the amphibian breeding season. The City will post wildlife signage along Laird Road to alert motorists of potential crossing locations.	Signage will be very ineffective in preventing amphibian mortality. They have no chance against cars and trucks. When the HCBP opens and before Laird Rd. is closed there will be an increase in nighttime traffic especially if businesses are operating 24/7. Currently traffic is less after 7 p.m. when the gravel trucks are done for the day. Despite less traffic hundreds of amphibians died in the last 2 years. The way to stop the mortality and preserve the species during their migration is to close the road. Will the city consider this interim measure until Laird is closed?	From information obtained during the 2009 Laird Road mortality surveys and 2010 Laird Rd amphibian surveys, wildlife culvert locations will be recommended. The City has agreed that wildlife culverts will be installed along Laird Road prior to the fall amphibian migration period.
24	Can the new Laird (Phase 3) be designed to accommodate critter crossings at the most southerly end to allow for amphibian and small mammal movement should we secure additional lands for corridor purposed through the site plan process?	Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.	What part of laird rd. are they talking about? Laird runs east to west - please clarify.	This is referencing the New Laird Road which will be situated within Phase 2 and Phase 3. In the event additional lands are secured along the southern boundary of Phase 2/3, a wildlife linkage will be implemented to connnect the Heritage Maple Grove and Forestell berm to the larger wetland complex. Where the new Laird Road may insersect with this linkage, wildlife crossings will be considered.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
25	Confirmation is needed regarding the presence of Jefferson Salamanders. Additional monitoring following MNR's established protocol is proposed for this spring. Prior to grading in the immediate vicinity of the Heritage Maple Grove and adjacent to the PSW's, the presence/absence of this species must be confirmed. However, staff are aware that the Draft Recovery strategy indicates that they are likely extirpated from Guelph. Staff have been consulting with MNR and will continue to consult with the Ministry to ensure the proposal conforms with the Endangered Species Act.	NRSI and the City worked in consultation with MNR staff and Dr. Jim Bogart to finalize a comprehensive salamander monitoring program within the business park for spring 2010 that will determine the presence/absence of Jefferson salamanders in the HCBP.	Grading has already occurred in the immediate vicinity of the Heritage Grove. Is the MNR aware of this?	The MNR is aware of these grading activities. Proposed grading activities were reviewed by City staff, and NRSI biologists with respect to potential impact on natural features and Jefferson salamander habitat. Based on habitat assessment (agricultural field, fill borrow site >120m from all wetlands and approximately 220m from Heritage Maple Grove), and findings from 2009 salamander monitoring, it was determined that there would be no direct impacts to any natural features, specifically the Heritage Maple Grove and Jefferson salamander. This work was carried out under Site Alteration Permit issued by the City.
27	Can grading activities avoid some of the smaller wetland features during the spring breeding season? Those identified to be removed could be filled in once the breeding season is completed or left to the site plan process where they may be incorporated into the design.	Input from NRSI and City Environmental Planner regarding timing/area restrictions will be written into the tender documents for the grading work.	I think PLC members should receive copies of all tendering documents in order to ensure that conditions requiring detailed information in the tender are addressed. Will we get copies?	Tender documents are posted on the City of Guelph website.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
30	Tree protection fencing is identified as Type 2 silt fencing, however, adequate signage around the treed portions of the site (particularly the Heritage Maple Grove) should be provided. Often trees are inadvertently removed as contractors are not aware that the trees are to be protected. Tree protection signage must be erected.	Tree protection signage will be erected prior to grading. Fencing and signage around the Heritage Maple Grove is already in place.	Despite the conditions in the EIR, the tree protection fencing around the grove was placed incorrectly within the dripline of the trees and damaged their feeder roots. How will signage protect the trees if the fencing is incorrectly placed and who will be monitoring the fencing?	It is intended that tree protection fencing locations will be sited by a qualified biologist prior to construction.
			To date as far as I know there has been no cover placed over the exposed roots of the grove trees so follow-up after the initial damage has been poor. This does not exactly instill any confidence that further problems will be addressed in a timely fashion.	Additional topsoil has been placed within the cleared area along Forestell Road. A certified arborist inspected the fencing area for potential impact to trees. Follow-up reports were prepared and submitted to the City and landowner outlining impacts as well as next-steps and recommended monitoring.
			Who will be in charge of making sure everything is done according to the checklist and grading plans? If your answer is the Environmental Site inspector then where was this person when the Grove was being fence and graded incorrectly?	Both the Enviornmental Inspector and City Inspector will ensure everything is done according to site plan checklist and grading plans. Unfortunately, there was miscommunication with respect to the Heritage Maple Grove tree protection fencing. Since this event, the landowner has had a Certified Arborist assess condition of trees and make recommendations for treatment and future monitoring.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
31	The current EIR recommends monitoring take place until 75% build out. Page 91 of the Environmental Impact Study recommends that monitoring take place two years post substantial 80% build-out. In conformance with the EIS recommendations, it would be prudent to monitor a minimum of two years post 75% build out. The most recent correspondence, March 31, 2009, from AECOM to GRCA indicates that the developer has agreed to two years of post development monitoring following 75% build out. Please ensure this item is identified in the subdivision agreement.	Environmental monitoring will continue 2 years after 75% build out of Phase 1, 2, and 3.	The response did not indicate whether the Environmental monitoring will be identified in the subdivision agreement. Please clarify that it is so.	Envionmental monitoring 2 years after 75% build out is to be included in the subdivision agreement.
34	Table 6-9 in the EIR, do not provide adequate details regarding triggers and contingency measures - if monitoring does document some significant changes what kind of adaptive management approaches/tools can be employed? The contingency measures for all monitoring components must be clearly identified in the tables.	NRSI, AECOM and Banks Groundwater will develop a report that will provide details on contingency measures (to be submitted in spring 2010).	Will this report be completed and available for review before the grading and construction of Phases 1 and 2 occurs?	Yes. Report was submitted to the City for their review on March 9, 2010. This document will be finalized pending City comments and circulated to the GRCA for their review.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
35	Table 6 - Fish Community and Monitoring Analysis states, "Specific quantitative triggers are not recommended at this time due to the absence of brook trout." This statement does not reflect the finding in the 2008 aquatic monitoring data which indicates that 4 brook trout were captured in Tributary A.	The 4 brook trout captured in 2008 were not captured within the quantitative monitoring stations, but were captured during comprehensive qualitative sampling conducted in an effort to find any individuals of this species. The baseline quantitative sampling demonstrates a general absence of brook trout, making it impossible to observe a change in the numbers of brook trout. Therefore, it is most appropriate to use the water temperature monitoring as a trigger for habitat suitability. A trigger for brook trout can be developed should a population become established and observed at the quantitative monitoring stations.	The fact that brook trout have been found in the HCBP portion of the Trib A since it was 1st studied in the 80's indicates that there is an established population. Maybe you just didn't find them in your earlier studies. Perhaps your stations were in the wrong place? Why is NRSI not recommending setting up a quantitative monitoring station where the trout were recently found? You know they are there so monitor them!	The monitoring stations are located where Brook Trout would be found when present. As part of the monitoring program, the methods (including station locations) are reviewed annually and recommendations are made to improve the monitoring program whenever opportunities are identified.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
50	During Laird road mortality surveys conducted by NRSI in spring 2009, a dead eastern milksnake (*Lampropeltis t. triangulum*) was found. The eastern milksnake is listed as a species of Special Concern by COSEWIC and the MNR; however, it is not protected under the Endangered Species Act (2007). The Guelph Natural Heritage Strategy recommends "flag locally significant species observations, but the level and extent of associated habitat protection be determined on a case by case basis with consideration for each species needs."	Milksnake is found within an extremely wide variety of habitats. It does not appear to prefer any particular habitat type; however, it is often found in prairies, meadows, pastures, hayfields, rocky outcrops and a variety of forest types. It is usually found in areas that are close to a water source. Milksnake is listed as a "specially protected species" in schedules of the Fish and Wildlife Conservation Act, 1997. It is forbidden to hunt, trap, kill, trap or hold in captivity any specially protected species without a permit.	Could you please provide PLC members with a copy of the spring mortality report from NRSI. I don't remember getting a copy of this report.	The Laird Road mortality report (NRSI 2009) will be posted on the City of Guelph website once the Phase 1 and 2 EIR package is approved.
			What impact will the barrier fencing along Laird Rd. have on the movement of milksnakes and other snakes across Laird Rd?	While the fencing is up along Laird Road, during the amphibian and reptile movement period NRSI biologists will be moving wildlife captured in the pitfall traps from one side of the road to the other to minimize impact on movement/migration.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
51	Based on the status of eastern milksnake and the fact that it is protected under the Species at Risk Act (2007), NRSI recommends that a during-construction siting protocol be developed.	This protocol may include education of construction crews on appearance of milksnake and its habitat, relocation of specimen if found during construction and an environmental inspector on-site during construction works to ensure specimens are moved if found (permit will be required from MNR to handle).	Could you please supply a copy of this NRSI recommends that a during construction siting protocol? Please explain how practical in situ this protocol will be to implement? How will construction workers on huge graders be able to see if they are grading areas where there are milksnakes? Will there be a construction worker walking in front of the graders looking for snakes trying to escape being crushed? Also snake movements are very dependent on temperatures, will the protocol take this into account?	The during-construction siting protocol has not been finalized for circulation.
55 - 72			Has the city provided this document to the Sierra Club, Wellington Water Watchers and GUFF and GFN? If not then they should as they need to see how their concerns have been addressed. They should be given the opportunity to respond to the comments on their issues and questions. If the PLC concurs I would recommend posting these documents including the TOR for Phase 3 on the City's HCBP information page on their website.	The City is committed to sharing information and had purposely set up a HCBP website so that any interested person or group has access to the details and documents.

Comments re Site Plan Checklist			
#	**Site Plan Item**	**PLC Comment**	**Response**
Sediment and Erosion Control			
1	All cleared and/or graded areas (bare soil) not built upon within 30 days is seeded with recommended native seed mix as outlined in tender documents.	Please identify what native seed mix will be used on the graded areas after 30 days.	The native seed mix recommended for graded areas is outlined in Section 5.4 of HCBP EIR; however, as Tender documents are revised, this seed mix may be altered accordingly.
2	Trees and other areas of vegetation to be retained are identified and delineated with temporary fencing located beyond the dripline to ensure that vehicle movement or material storage does not disrupt vegetation (especially root zones).	Please add the requirement in the EIR for the minimum distance for fencing. Was it 1 meter or more beyond the dripline? I can't recall.	Protection zone (1m from dripline) can be added to the Site Plan Checklist
Snow Storage			
3	Snow storage areas designated in a location at least 30m from wetland features and 10m from woodlot areas. Storage areas take into account the natural features and functions described in the Consolidated EIS and EIR.	The locations should be changed for woodlands - snow storage areas should also be at least 30 meters from the woodlands as well since the trees and wildlife could be negatively impacted from runoff. Also many of the swales run along the woodland edges. No contaminated runoff from snow should be directed into the swales since it is contaminated with salt, sediment (which will clog the SWM's) and VOC's.	The swales are designed for stormwater conveyance from the site to the stormwater management facilities and will therefore convey runoff from the parking lots. The SWM facilities are designed to provide sediment removal and quality enhancement before discharge to Tributary A.
Maintenance and Refueling Areas			
4	Maintenance and refuelling areas located away from natural features on-site (minimum 30m from wetland areas and 10 m from woodlot edge).	Shouldn't any refueling areas be located away from drainage swales too since these carry water to the SWM's?	Refueling areas will be kept away from all sensitive features.
	Site specific location designated at Site Plan stage.		
	Minor grading to direct surface runoff from natural features if maintenance and refuelling areas located in proximity to natural features (i.e. 30m)		

Comments re Site Plan Checklist			
#	**Site Plan Item**	**PLC Comment**	**Response**
Laird Road			
5	Installation of subsurface utilities prepared and reviewed by a qualified ecologist or biologist for potential impacts to neighbouring wetlands and watercourses.	Where is the reference to no construction activity during spring amphibian migration etc. If it is not placed here where will it be given to the builders?	Road projects and watercourse crossings will consider the timing of amphibian migration (where it exists) in the construction schedule.
	Using trench technology for installation of subsurface utilities so no direct disruption of vegetation.		
	Sediment and eroson control measures implemented and maintained throughout construction period.		
	Restoration plans recommended in HCBP Phase 3 EIR/Tender package implemented upon closure of Laird Road.		
Subsurface Watermains and Sewers			
6	Use of granular backfill for subsurface pipes to create a conduit for groundwater flows.	Since groundwater levels are high over much of Phase 1 and parts of Phase 2 and 3 wouldn't it be more proactive and prudents to require cut off collars on all of the subsurface pipes?	The design includes clay seals every 100m where the trench penetrates the watertable to prevent migration of groundwater through the bedding.
	All subsurface pipes installed in areas of high groundwater levels include cut-off collars to prevent impacts to groundwater flow patterns.		
Lands Adjacent to Heritage Maple Grove			
7	Identify hazard trees within the grove inspected by a qualified City staff person or designated Certified Arborist, to determine the need for hazard tree management (pruning, removal, etc.)	Why is this in the checklist? Shouldn't there be a park plan 1st before trees logged? I would like to see a copy of the proposed invasive species removal plan please as well as a list of trees proposed to be logged.	This Site Plan Checklist is intended to be specific to items within the HCBP. The City will devise a plan for the Heritage Maple Grove at the Site Plan Stage. Currently, there is no invasive species removal program or list of tree species proposed to be logged.
	City has prepared and implemented an invasive species removal program (especially for common buckthorn (*Rhamnus cathartica*)).		
	Heavy-duty paige wire fence installed around perimeter of Heritage Maple Grove to provide additional protection.		
General Comment			
8		Maybe I missed it but I could not find a reference to construction of berms? Will they already be in place at the Site approval stage?	The construction of the berms is included in the earthworks contract and will therefore be in place at the site plan approval stage.

Hanlon Creek Business Park Environmental Implementation Report

Comments re Suzanne Young Memo - April 1, 2009 Environmental Advisory Committee's Outstanding Concerns Regarding the Hanlon Creek Business Park EIR			
#	**Memo Comment**	**PLC Comment**	**Response**
Items identified at the February 11, 2009 meeting and added since EAC's review of the document:			
1	Monitoring of mitigation measures for the thermal regime (reserve fund available to retrofit and address potential changes in temperature).	Will a reserve fund be set up? If not who will pay to mitigate?	To be determined by the City of Guelph
2	Design and functionality of bottom draw	I could not find any reference in the NRS's response re design and functionality of bottom draw	The bottom draw design included in the SWM facilities has been reviewed and approved by GRCA and MOE.
3	Soil mix for SWM Plantings	I could not find any reference in the NRS's response re soil mix for SWM plantings	As per Standard Notes within restoration tender drawings, 'all plant materials will be planted in topsoil native to the site. No additional soils or additives will be used unless approved by Environmental Inspector.
4	Confirmation of trail materials	I could not find any reference in the NRS's response re confirmation of trail materials	HCBP EIR Section 9.0 Pedestrian and Open Space Trail System (NRSI 2009), Figure 8. a) off-road bike trail (southern portion of Block 14) - wood chip b) on-road bike trail - asphalt c) off-road trail - limestone screenings d) multi-use trail - asphalt

Comments re Suzanne Young Memo - April 1, 2009 Environmental Advisory Committee's Outstanding Concerns Regarding the Hanlon Creek Business Park EIR			
#	**Memo Comment**	**PLC Comment**	**Response**
	Please explain where the answers to the following are as I could not find them:		
5	**Accuracy of Pre-Construction Bird Monitoring**		
	The FBMP (Forest Bird Monitoring) in 2006 and 2008 was done incorrectly. The timing window for FBMP are one survey between May 24 - June 17 and a second survey between June 13 - July 10th. This split in the monitoring is in order to survey early breeders. The first survey in 2006 and 2008 was June 20th, after the window for early breeders.		Annual breeding bird monitoring conducted within the HCBP is a compilation of both the FBMP and Ontario Breeding Bird Atlas program. Both monitoring programs identify that surveys be conducted during the peak breeding season, which varies slightly from year to year, depending on migration and weather conditions; however, survey timing from year to year has generally been consistent. Monitoring is conducted during the time window that best represents the previous years monitoring conditions, making data comparable from year to year.
	In addition the vegetation monitoring plot (1x1m's) should be done in two seasons, spring for the spring ephemerals and early plants and in the late summer or fall for the later blooming species, especially in a wetland. The monitoring done in 2007 was completed June 5, 6, and 14th. The vegetation monitoring should be done within a week of the original surveys replicated each year, making them comparable. I don't think you could actually compare this information year to year, making the monitoring program ineffective.		The annual monitoring methodologies have been reviewed by the City and EAC. Since 2006, vegetation monitoring has been conducted within established plots in the height of the growing season (June). As weather, flowering time, water levels, site conditions etc. change annually, monitoring is conducted during the time window that best represents the previous years monitoring conditions, making data comparable from year to year.

Comments re Suzanne Young Memo - April 1, 2009 Environmental Advisory Committee's Outstanding Concerns Regarding the Hanlon Creek Business Park EIR			
#	**Memo Comment**	**PLC Comment**	**Response**
6	**Tree replacement policy/progam**		
	I understand from the restoration plans that the larger trees and shrubs planted will be on a 2yr warranty based on survival. If they die after 2 years then they are replaced? Can this be changed to being based on growth? Can an assessment be done on the appropriateness of the species to the site? Perhaps the site was wetter or became wetter over two years than anticipated and the species planted is now not appropriate for that location and should be replaced with something else not the same species over and over again. If the replacement is based on growth, then trees that are not healthy and may die in year 3 could also be replaced in year 2.		The following planting/warranty items are addressed in the Standard Notes provided in the restoration tender drawings and are standard practice in landscape plans: 1. thoroughly water all plants immediately after installation. The Contractor is required to water all plant material as directed by Environmental Inspector during construction and the warranty period. 2. The Contractor is to identify with the Owner and Environmental Inspector any maintenance requirements that are necessary for warranty purposes. 3. All landscape works will be guaranteed for a period of two years following inspection. Plant material, which is not in a healthy growing conditions two years after inspection, shall be replaced to the satisfaction of the City with an additional one-year warranty period. Supply and plant all replacements in strict accordance with the plans and specifications. 4. Plants shall be guaranteed for a minimum of two years from the issue date of the certificate of completion. 5. All plants shall be inspected at the end of the guarantee period (2 years). Plants which, at that time, are not in healthy vigorous growing condition, to the Environmental Inspector's approval, shall be replaced at no extra charge.

Comments re Suzanne Young Memo - April 1, 2009 Environmental Advisory Committee's Outstanding Concerns Regarding the Hanlon Creek Business Park EIR			
#	**Memo Comment**	**PLC Comment**	**Response**
7	**Restoration Plans**		
	The planting contract should be a sub-contract to a native restoration or planting company. Not a construction company. I have encountered other developments were the plants put in the ground were purchased from a nursery and were not actually a native species but a hybrid. This resulted from inexperience nursery staff supplying materials and no checks being made after the fact. In addition nursery has been known to make substitutions for species when they are out of stock of the native one. This should also be discouraged.		Standard notes included in the Hanlon restoration tender document state that planting shall be by a contractor (not construction company). The standard notes also specify: 1. contractor shall supply all materials in quantities sufficient to complete work on drawings. Any discrepancies shall be reported to the Environmental Inspector dor direction. 2. Environmental Inspector to be contacted for inspection and approval prior to plant material arriving on-site. Environmental Inspector reserves the right to reject any plant materials that have not been inspected and approved. All plant material should be from local genetic sources. 3. Substitutions for materials, products or quantities will not be accepted without the prior written permission of the Environmental Inspector.
8		With respect to the recharge, water temperature modeling, SWM design and hydrology, hydrogeology letters and reports. I believe that the city staff and agency letters and reports contained in the information package should be sent to Dr. Hugh Whitely for review as he is an expert and as such was instrumental in the development of these items during the OMB and for the OMB settlement.	Relevant information is available on the City HCBP website.

Comments re Agency and Environmental Group EIR Comment Table				
#	**Nature of Comment**	**Response from EIR Comment Table**	**PLC Question/Comment**	**Response**
95	Since the grove will be fenced and gated why cut down hazard trees as they do provide habitat. The tallest dead tree in the grove appears to act as a staging area for migratory birds. I observed a large flock of robins (at least 25-40 birds) this last autumn flying in and perching in this tree as I walked along Forestell Rd to gather apples from the road side tree. If the park is gated and fenced the hazard trees could remain as part of the habitat and if a trail is developed only those that post a risk could be selectively cut. Therefore, no trees should be cut until a comprehensive plan is developed and approved.	Hazard trees are a liability risk as the grove may be utilized by pedestrians. The City of Guelph will take ownership of the grove; therefore, retaining hazard trees will be a liability. Also, from a liability perspective, as certified arborists, it is mandatory that hazard trees be identified and recommended for removal.	A stewardship and park plan should be created before any trees are removed. Whether trees are deemed a hazard or not is partially dependent on whether there are any targets in the immediate areas of the trees. Cutting would remove some of the oldest heritage trees. Some of these trees might be saved by cabling and other established methods of heritage tree preservation. These avenues should be explored before any trees are logged. Until there is a plan for the park I would oppose any tree removal. Please indicate if there are any plans to cut down trees in the near future before a plan is developed for the park.	Although conveyance to the City is not a requirement or condition, the City has consulted with Cooper about possible dedication of the Heritage Maple Grove lands to the City. The block would then become a publicly managed woodlot and no decision has been made yet regarding it becoming a City park.

Correspondence Related to

February 2009 EIR

&

Agency and Environmental Group EIR Comment Table

City of Guelph
Correspondence/Comments

MEMO

DATE	April 1, 2009
TO	**Astrid Clos, Peter Cartwright, David Stephenson, Tara Brenton**
FROM	Suzanne Young
DIVISION	Development Planning
DEPARTMENT	Community Design and Development Services
SUBJECT	**Environmental Advisory Committee's Outstanding Concerns Regarding the Hanlon Creek Business Park EIR**

Below is the list of outstanding concerns which EAC is requesting be addressed at the upcoming April 8, 2009 meeting:

Items identified at the February 11th, 2009 meeting and added since EAC's review of the document:

- Satisfaction of the temperature modelling **– (please refer to the additional comments provided below)**
- Laird Road – City Standards (EMS standard, width (recommend 5.5metre or less), curb design, profile, canopy cover, surfacing options, need for service utilities, and hydro connection should be located below ground to allow canopy growth) **– (please refer to the additional comments provided below)**
- Design and functionality of bottom draw
- The location and function of the SWM outlet structures
- Presence/Absence of the Jefferson salamander and the associated habitat
- Monitoring of mitigation measures for the thermal regime (reserve fund available to retrofit and address potential changes in temperature)
- Laird Road Closure (timing and construction of the interchange)
- Corridor connection to the south of Forestell Road
- Lot level controls
- Implementation of recommendations/mitigation measures
- **Swing gates on the tails should be staggered**
- **Concern with fish passage due to depths of the plunge pools**
- **Grading appears to extend into the 5 metre no touch boundaries**
- **Accuracy of the pre-construction bird monitoring**
- **Protection of habitat of bird species in decline**
- **EIR needs to address significant bird species occurrences**
- **Tree Replacement Policies**
- **Restoration Plans – need to ensure native plantings on site**
- **Corridor linkage is required to the Heritage Maple Grove**
- **Creek Culvert Crossing on Road A**
- **Downey Road Watercourse – tree plantings should be provided in addition to shrubs**

Previous list from meeting minutes in 2008 (Reference Appendix XXI)

- Crossing design of Tributary A by Road A
- Overall restoration plan required
- Soil mix for SWM Plantings
- Contingency Plans
- Post Construction Monitoring

- Stormwater Management Report and Thermal Modelling to be incorporated
- Confirmation of trails materials
- Diagram showing pre and post environmental area to determine net gain/loss
- Opportunities for the Heritage Maple Grove
- Retention of the monitoring wells and piezometres
- Water balance and recharge discussion required in the EIR
- Design, description and plantings of the conveyance swales to be provided
- EIR to describe how plantings in the buffers and swales are consistent with the EIR
- Confirmation of size and retention of the Heritage Maple Grove.

Additional Clarification for those Items Identified in **Bold** above.

1. Accuracy of Pre-Construction Bird Monitoring
The FBMP (Forest Bird Monitoring) in 2006 and 2008 was done incorrectly. The timing windows for FBMP are one survey between May 24 - June 17 and a second survey between June 13 - July 10th. This split in the monitoring is in order to survey early breeders. The first survey in 2006 and 2008 was June 20th, after the window for early breeders. In addition the vegetation monitoring plot (1x1m's) should be done in two seasons, spring for the spring ephemerals and early plants and in the late summer or fall for the later blooming species, especially in a wetland. The monitoring done in 2007 was completed June 5, 6 and 14th. The vegetation monitoring should be done within a week of the original surveys replicated each year, making them comparable. I don't think you could actually compare this information year to year, making the monitoring program ineffective.

2 . Tree replacement policy/program
I understand from the restoration plans that the larger trees and shrubs planted will be on a 2yr warranty based on survival. If they die after 2 years then they are replaced? Can this be changed to being based on growth? Can an assessment be done on the appropriateness of the species to the site? Perhaps the site was wetter or became wetter over two years than anticipated and the species planted is now not appropriate for that location and should be replaced with something else not the same species over and over again. If the replacement is based on growth, then trees that are not healthy and may die in year 3 could also be replaced in year 2.

3 . Restoration plans
The planting contract should be a sub-contract to a native restoration or planting company. Not a construction company. I have encountered other developments were the plants put in the ground were purchased from a nursery and were not actually a native species but a hybrid. This resulted from inexperienced nursery staff supplying the materials and no checks being made after the fact. In addition nursery has been known to make substitutions for species when they are out of stock of the native one. This should also be discouraged

4. Corridor
There is a need for a corridor which links the Heritage Maple Grove to the PSW.

5. Creek crossing and culvert on Road A
The EIR proposes a 34m culvert (page 109). Why is such a long culvert needed? This was to be a two-lane road. The break in habitat north and south of the road will be even greater than that. This is at odds with our previous discussions with the consultants.

At EAC we discussed the possibility of narrowing the road at that point. We also asked them to examine a bridge instead of a culvert and this was mentioned in the EIS. Clearly this was not considered and not discussed in the EIR.

6. Downey Road Watercourse
The plantings for Downey Road watercourse include only shrubs and no trees. I assume a goal should be canopy closure over the watercourse to increase shade and reduce water temperature. If so that should be stated and trees included in the planting plan.

7. Significant Bird Occurrences
The Natural Heritage Strategy identifies a cluster of occurrences of significant bird species in the heritage woods off Forstell Road including Eastern Kingbird (Tyrannus tyrannus), Field Sparrow (Spizella pusilla), Northern Flicker (Colaptes auratus), Rose-breasted Grosbeak (Pheucticus ludovicianus) and Savannah Sparrow (Passerculus sandwichensis). All of these species may not remain significant on the new list of significant species. Several of these species are grassland birds and/or aerial insectivores that have undergone significant declines. Nevertheless, this information has been available for several years and should be addressed in the EIR. Provisions for these species should be provided.

In addition, Winter Wren (Troglodytes troglodytes), Savannah Sparrow (Passerculus sandwichensis) and Northern Flicker (Colaptes auratus) occur in northern portions of the site. Both Savannah Sparrow and Winter Wren are area sensitive species. Additional consideration is required for these species.

Thermal Modeling – Hanlon Creek Business Park Stream Temperature Impact Report Continuous Modelling with HSP-F (Items 8-17)

8. Page 23 Section 3.2 Did AECOM implement the energy budget component of the model? Does the HSP-F model use units of calories in the source code instead of S.I. units?

9. Page 30 Section 3.3.3 Does the model need a measure of water vapour in the air to calculate evapotranspiration and the rain temperature as stated in Appendix A? If water vapour was estimated from the daily minimum temperature (ie to calculate dew point from night time minimum temperature), then it might underestimate humidity during days with lots of evapotranspiration.

10. Page B1 Appendix B The authors describe changing the infiltration and interflow parameters of the model by factors of 2 to 2.5. Is there a physical justification for this change (i.e. are the soils at the site more porous than the reasonable estimates of Southern Ontario)? Are there other empirical parameters or coefficients in the model that are changed to calibrate the model flow rates with observations?

11. Page 31 Section 3.4 The hydrological model is calibrated on a weekly basis using measurements obtained from late October to late November 2007. These conditions may not be representative of the rest of the year so the calibrated model parameters and coefficients are not necessarily applicable outside the calibration period. This could potentially lead to a bias in the flow and temperatures calculated by the model. More importantly, such a bias could lead to overestimating the summertime flows when warm temperatures are of particular concern. Examples of items that may contribute to this bias are:
a) Transpiration will be effectively zero during the late fall. The model, as it is, might not be able to account for this in the water budget in the summertime. If not, then modeled summertime flows would be overestimated.

b) Soil moisture during the calibration period may be much higher than during the summer. This would result in possibly more soil moisture storage available in the summer leading to the model overestimating river flows.

c) Canopy interception will be much lower in the late autumn due to the reduced leaf area index. Precipitation during the calibration period would have a higher fraction of water moving rapidly to the waterways than during the summer. This could lead to an overestimate of summertime river flows.

d) Generally speaking, surface temperature and the air temperatures will be similar during the calibration period compared to the summer when large surface temperatures might be expected. This could lead to the calibration coefficients under predicting heat transfer to precipitation outside of the calibration period. Modelled runoff temperatures in the summer might be underestimated compared to measurements.

It would be very useful to compare the model results with all of the stream flow measurements outside the calibration period. Such a comparison would provide insight into the relative uncertainty of this hydrological model and allow the reader to gauge the confidence in the conclusions. Such a comparison would be most important during those periods when we are interested in high stream temperatures and possibly low stream flows (such as warmest part of summer). Due to the wide range in magnitude of stream flows, it might be possible to plot the ratio of measured / modeled flow volumes (weekly or daily) over the entire period of measurements. Without any discussion of the model uncertainty, the reader doesn't know if the flow calculations are reasonably close or are off by orders of magnitude.

12. Page 32, first paragraph. The ground temperatures discussed in this section are the groundwater temperatures? Is this correct?

13. Page 50, second paragraph The report states that heat exchange between the precipitation and the surface is short lived and heavily mitigated by the ponds. Is such a heat transfer scheme included or is the runoff water only considered to be the air (or wet-bulb) temperature? Surface temperatures of non-transpiring, low-albedo urban surfaces can be very high and precipitation events can happen relatively quickly (e.g. convective thunderstorms on a hot summer day). To discount this type of energy exchange seems somewhat optimistic. Are there any references in the technical literature to substantiate this claim? There is an article in the Journal of the American Water Resources Association (Vol. 44 number 5 by Thompson, Kim and Vandermuss). I haven't thoroughly reviewed it but it does appear that runoff temperatures can increase due to contact with asphalt in the summertime.

14. Page 38 Section 3.7.3 - the simulation of pond 4 is compared to the bottom draw pond example in Kitchener. Is the model re-run using the watershed parameters and coefficients for the Max-Becker pond or is the model continuing to use the coefficients calculated for the HCBP? If the latter why might the agreement be anything but coincidental?

Data from the Waterloo airport, the University of Waterloo, and the Elora research station have been examined for August 2nd, 2006 (data from GTI is unavailable on this date). It appears that there was a large rain event between 13:00 and 14:00 in Elora which did *not* occur at either of the Waterloo stations. At around 21:00 rain starts at all of the weather stations (suggesting a frontal type of storm). The data presented in Figure 3.5 appears to only use the Elora weather station and doesn't consider the closer stations.
The text discusses this day as a worst case scenario when in fact, there was possibly no runoff into the Max-Becker pond until night time (when long-wave cooling of surfaces and lower air temperatures would reduce the temperatures of runoff). Are there any other cases that would provide better support forthe arguments in this section?

15. Page 38 Section 3.7.3 The Kmud coefficient depends on the temperature difference between the ground and pond. Should the sign of this coefficient depend on the direction of groundwater flow? When base flow is recharging the pond (and so the local groundwater elevation is above the pond surface) than there will be mass flow into the pond and cooling (when $T_{ground} < T_{pond}$). However, during a storm, the pond elevation will rise possibly above the local water table elevation (especially during low flow conditions in the summer) so there will be flow from the pond to the surrounding terrain. In such a case, the pond might preferentially be loosing cool water due to thermal stratification so the average pond temperature will be going up. Does the pond level rise a meter or two over a period of hours to days? Could this happen or is this unlikely / impossible?

16. Page 44 - last paragraph states that year 2001 was discarded due to unusual results attributed to model spin-up. In section 3.6 is stated that the first year (2000) was discarded. Section 3.3.3 states that the model was run from January 2000. Did the results from 2001 prove to be particularly unruly or is this a typo?

17. Page 52 One of the premises of this analysis is that ground temperatures will reduce runoff temperatures to an acceptable level through infiltration galleries, and groundwater flow into the waterways. However, the authors don't mention if there is any effect of urbanization or development on ground temperatures over a long-term period. With asphalt parking lots, concrete foundations and other new surfaces (or things like ground-source heat pumps), would temperatures below the surface gradually increase or decrease over a period of years?

18. Laird Road
The proposed new sanitary sewer alignment along the entire length of Laird Road (Pages 61 and 144 of EIR) goes against the original compromise premise for the entire approach to the EIS for the Hanlon Creek Business Park.

The premise of the Hanlon Creek Business Park EIS was that development could occur around the edge of the natural areas if the central core area of wetland and woodlands was secured and enhanced by the closing of Laird Road and other measures (see page 17 of EIR). That approach formed the basis for everything that has been done since. Initially the city agreed that the road bed would be removed. The city then indicated the road bed needed to be retained for emergency services. Now the city insists that the road bed must remain paved and a full six metres wide.

That weakened the compromise approach. But now to propose to turn the "closed" Laird Road into a utility corridor with major new construction fundamentally undermines the compromise.

This calls into question whether the city supports the compromise approach that emphasized securing and enhancing the core natural area in the centre of the business park. The city could proceed with further realignments of watermains and other utilities along the "closed" Laird Road. The city has considerable latitude for such actions. This last-minute change undermines EAC's trust that the city will implement the agreed-upon approach.

The EIR indicates that the proposed sewer alignment would make it impossible to install new culverts to facilitate aquatic and wetland species movement and increase ecological connectivity (page 61 of EIR).

This illustrates one way the proposed sewer alignment undermines mitigation and enhancement efforts. So the only real change regarding Laird will be the removal of traffic at some future point after the Hanlon Expressway interchange is built and/or Phase 3 is embarked upon.

Other impacts of Laird Road will increase in the short term and remain at current or higher levels into the future.

The alignment of the sanitary sewer along Laird Road was not proposed in the 2004 servicing report. Neither was it proposed in the 2004 EIS. As a result the impacts of the sanitary sewer were not assessed. A sanitary sewer will have significant impacts at the time of construction and in the future during operation, maintenance and replacement. The impact is still un-assessed as it was not assessed in either the EIS or the EIR.

Nor was the sanitary sewer alignment along Laird proposed in the 2007 draft EIR. It was only proposed in the June 2008 revised EIR which EAC did not review. The sanitary sewer alignment was not highlighted in the overview of the EIR at our February 2009 EAC meeting.

This is an unforseen and unfortunate change of course. The consensus approach to the Hanlon Creek Business Park is in danger of unraveling.

The change puts EAC in a difficult position having based all previous decisions regarding HCBP on the compromise outlined above and now faced with the city's 11th hour action to undermine that compromise.

INTERNAL MEMO

DATE	April 3, 2009
TO	**Al Hearne**
FROM	Suzanne Young
DIVISION	Development Planning
DEPARTMENT	Community Design and Development Services
SUBJECT	**Hanlon Creek Business Park – EIR Review**

Al,
The purpose of this memo is to provide the Environmental Planning staff comments on the Hanlon Creek Business Park Environmental Implementation Report (February 2009) prepared by Natural Resource Solutions Inc.

The majority of Carrie Musselman's comments dated August 26, 2008 have been addressed; however, a number of additional items need to be addressed. The remaining outstanding concerns are provided below:

Laird Road

1) The EIR, AECOM Drawings and Appendix XXI contain conflicting statements regarding the construction of a sanitary main and a water main along Lair Road. The most recent engineering drawings propose a water main only through the closed section of Laird Road. This needs to be clarified.

2) The watermain installation on Laird Road should avoid the amphibian breeding season.

3) Based on discussions with City Engineering staff the need for the emergency access may no longer be necessary. I recommend we make a concerted effort is Phase 3 to ensure Laird Road and the associated road bed is removed and naturalized.

4) Please confirm in the EIR and engineering drawings that the asphalt surface will be removed. Perhaps a Granular B material could be proposed until the ultimate closure of Laird Road is examined in Phase 3.

5) Additional deciduous plantings should be installed following the closure of Laird Road to provide some additional canopy cover.

6) Mitigation measures recommended in the EIR should be employed in the interim to reduce amphibian mortality.

New Laird Road

7) Can the new Laird (Phase 3) be designed to accommodate critter crossings at the most southerly end to allow for amphibian and small mammal movement should we secure additional lands for corridor purposes through the site plan process?

Jefferson Salamanders

8) Confirmation is needed regarding the presence of Jefferson salamanders. Additional monitoring following MNR's established protocol is proposed for this spring. Prior to grading in the immediate vicinity of the Heritage Maple Grove and adjacent to the PSWs the presence/absence of this species must be confirmed. However, staff are aware that the Draft Recovery strategy indicates that they are likely extirpated from Guelph. Staff have been consulting with MNR and will continue to consult with the Ministry to ensure the proposal conforms with the Endangered Species Act.

Significant Bird Species

9) Some additional consideration should be given to the significant bird species identified on site. Retaining more hedgerows and avoiding mass grading would assist to protect some of the habitat for these species – at least in the interim. At the site plan level we may be able to reduce area parking and coverage to retain some of the meadow/field areas as well as the hedgerows.

Grading

10) Can grading activities avoid some of the smaller wetland features during the spring amphibian breeding season? Those identified to be removed could be filled in once the breeding season is completed or left to the site plan process where they may be incorporated into the design.

11) Given the tight timeline do we foresee grading activities extending into the fall and winter months? If so how will we ensure the site remains stabilized?

12) Would it be possible to avoid mass grading and grubbing at the initial stages to retain some of the hedgerows and existing topography? Could a staged grading plan be considered?

Tree Protection

13) Tree protection fencing is identified as Type 2 silt fencing, however, adequate signage around the treed portions of the site (particularly the Heritage Maple Grove) should be provided. Often trees are inadvertently removed as contractors are not aware that the trees are to be protected. Tree protection signage must be erected.

Monitoring

14) The current EIR recommends monitoring take place until 75% build out. Page 91 of the Environmental Impact Study recommends that monitoring take place two years post substantial 80% build-out. In conformance with the EIS recommendations it would be prudent to monitor a minimum of two years post 75% build out. The most recent correspondence, March 31, 2009, from AECOM to GRCA indicates that the developer has agreed to two years of post development monitoring following 75% build out. Please ensure this item is identified in the subdivision agreement.

15) The EIR states that after 75% build out, "Sate of the Watershed monitoring will take over". State of the watershed monitoring is not designed to monitor specific properties or their associated impacts. It is a watershed based approach to reviewing water quality, quantity and flooding in the Grand River and its tributaries.

This is not an appropriate monitoring proposal; therefore, any reference to State of the Watershed Monitoring should be removed.

16) Section 10.0 speaks to monitoring and contingency measures. Appendix XXI recommends, "The long-term groundwater monitoring program could therefore be the responsibility of the City, with the potential of establishing cost-sharing arrangements with each land-owner in the HCBP". Given the estimated cost of the comprehensive monitoring program (groundwater, benthics, water temperature, etc), it seems reasonable that the City enter into these recommended cost-sharing agreements to ensure long term monitoring does not become the responsibility of the local tax payers or be deferred to State of the Watershed Reporting. Contingency funds should also be allocated through the subdivision agreement to ensure money is available for mitigation measures should they be deemed necessary.

17) Tables 6-9, in the EIR, do not provide adequate details regarding triggers and contingency measures – if monitoring does document some significant changes what kind of adaptive management approaches/tools can be employed? The contingency measures for all monitoring components must be clearly identified in the tables.

18) Table 6- Fish Community and Monitoring Analysis states, "Specific quantitative triggers are not recommended at this time due to the absence of brook trout". This statement does not reflect the findings in the 2008 aquatic monitoring data which indicates that 4 brook trout were captured in Tributary A.

19) Appendix XXI indicates that a "terms of reference for these monitoring components will be submitted to the GRCA and the City for review". A comprehensive terms of reference for the monitoring plan should be reviewed and approved by GRCA and City staff prior to any grading and grubbing activities.

20) Monitoring details do not speak to monitoring of the constructed channel (as requested by Carrie Musselman, August 26, 2008).

21) Monitoring of stormwater management facilities performance, sediment accumulation and landscaping survival is still not well documented in the monitoring section of the EIR (as previously indicated by Carrie Musselman, August 26, 2008).

Downey Channel

22) Drawings to depict the natural channel design should be provided to ensure the channel is constructed properly with pools, riffles and adequately sized meanders; however, I do understand that ultimate approval of this channel is the responsibility of the GRCA/DFO.

23) Additional tree plantings should be incorporated on the associated landscape plan to assist with naturalization.

Buffers

24) There are several locations on the engineering drawings where it appears that grading activities will encroach into the 5 metre no touch buffer. Was this agreed to

by GRCA staff? From the City's perspective the 5 metre no touch buffer must be strictly adhered to.

Heritage Maple Grove

25) The EIR states that, "since the grove is currently growing on lands that are higher in elevation, on well drained soils, no change in soil moisture region within the stand it anticipated" (p.31). Is this conclusion supported by the hydrogeologic findings?

26) How will the hydrology to this area be maintained in the interim while extensive grading activities and slope cutting are taking place?

Downey Tributary Crossing

27) Please indicate why two - three culvert crossings are proposed on the Downey Tributary. Were additional designs considered?

Site Plan Checklist

28) The infiltration target rates and associated water balance mapping must be added to the site plan checklist.

Condition of Approval

29) Condition 12 specifically states that the comments raised by the Guelph Field Naturalists are to be addressed. The EIR, Appendix XXI and XXII do not specifically address the Guelph Field Naturalist comments.

Drawings

30) Drawing No. 22490-01-C04 – staging sequence appears to be out of order – please confirm sequence with GRCA Aquatics staff.

Previous Comments

31) The Public Liaison Committee inquired regarding the possibility of forming a natural heritage/watershed group for the HCBP similar to what has been done at Laural Creek. The group would deal with education issues, monitoring and restoration. Appendix XXI indicates that "this request falls under the mandate of the River Systems Advisory Committee" and should be discussed at their next meeting. Was this recommendation discussed with staff or RSAC?

32) Sketch P01, which was suppose to depict the location of 2004 and 2007 stormwater management facilities, was to be included in the EIR – this was not provided in the most recent copy.

I trust these comments are of assistance. Should you have any questions or concerns please come see me.

Kind Regards,

Suzanne Young

cc. Colin Baker, Helen White, Scott Hannah and Rajan Philips

MEMO

TO: Helen White, Park Planner
Colin Baker, Environmental Planner

FROM: Murray Cameron, Manager of Parklands and Greenways
Randy Drewery, Supervisor of Forestry
Rowland Cave-Browne-Cave, Supervisor of Infrastructure and Horticulture

DEPARTMENT: Operations

DATE: December 30 2009

SUBJECT: **Hanlon Creek Business Park---Landscape Plan Comments**

Comments apply generally to all drawings and where possible, specific landscape plans have been referenced.

- Remove from the plant lists the following trees/shrubs:

Populus deltoides	Cottonwood
Populus tremuloides	Trembling Aspen
Ulmus americana	American Elm
Salix exigua	Sandbar Willow

Possible substitutions

Acer saccharum	Sugar Maple
Acer saccharinum	Silver Maple
Celtis occidentalis	Common Hackberry

Possible substitutions cont'

Rhus aromatica	Fragrant Sumac

- Note duration of warranty period for plant material
- Specify environmental inspector←City of Guelph staff?
- Specify seeding rates for nurse crop *Avena sativa,* Annual Oats
- Working within natural buffer---specify skid steer to be track unit to minimize compaction

Operations Department

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MEMO

- Planting details to spec. 2 x 2 wooden stakes vs. T-bars for ease of removal post-warranty period, or confirm all t-bars/wires to be removed at end of warranty.
- Closed section of Laird Road is to remain? Gates to be installed to control access? Will road surface remain and/or be ground to serve as a trail connection?
- Concern re: plantings over gas easement see L-02 and L-11
- What is the detail for the spillway at the trail see L-02
- What is the purpose of the T-stubs along the trail?
- Proposed sub-drains to be noted on plans---assumed infrastructure, but not sure
- Confirm vehicle access points for storm pond maintenance
- Dead end trails on L-03, L-08 and L-11---any possibility to link trails for a circuit? The dead-end trail on L-11 is particularly long—signage to be considered denoting no exit?

Thanks for the opportunity to comment.

Operations Department

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INTERNAL MEMO

DATE	Jan 8 2010
TO	**Colin Baker**
FROM	Helen White
DIVISION	Development and Parks Planning
DEPARTMENT	CDDS
SUBJECT	**Hanlon Creek Business Park – Tender Engineering Plans Comments by Parks Planning and Operations**

While reviewing the landscape plans, Parks Planning and Operations generated the following comments that apply to the engineering plans:

1. Please ensure that the designs of the culvert/weeping areas that cross the trails (on L-02, L-04, L-13 and any others) are stable, resistant to erosion and low maintenance. We'd like to review this detail.

2. Check that the three-point turn areas on the access roads are sufficient size for the required maintenance vehicles.

3. Signage- please provide allowance in tender for the following (standard traffic type signs – steel with steel u-channel posts) if not already included (final locations, design and wording to be reviewed by parks planner when required):

    - Trail wayfinding signs: 4
    - Stormwater management signage: 4; wording to include swm safety information and "clean up after your pet" bylaw reference
    - Environmental education signage at trailhead (per EIR): 7; to include trail map, street address, "clean up after your pet" bylaw reference
    - Trail stop signs, per Traffic Services standards (attached): 19
    - Trail crossing signs, per Traffic Services standards: 8
    - "service vehicles only / no exit signs" (for dead end trails): 3

4. Replace the trail gate detail with revised one (attached)

5. For the two long dead-end swm access roads/trails (Block 5 and Block 15): provide compacted granular B surface only; maintenance to be occasional flail (rough cut) mowing only to discourage trail use.

6. In addition to these, I enclose my marked up plans summarizing my previous engineering comments (given verbally at meeting with AECOM) for reference.

Helen White
Parks Planner

Development and Parks Planning
CDDS
Location: City Hall

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E Helen.white@guelph.ca

C Rowland Cave-Brown-Cave, Randy Drewery

File T:\ParksPlanning_Park Planning\PLANNING\SOUTH DISTRICT\Subdivisions\Hanlon Creek Business Park\Engineering Plans\Tender engineering plan comments.com

INTERNAL MEMO

CITY OF Guelph
Making a Difference

DATE Jan 8 2010

TO **Colin Baker**

FROM Helen White
DIVISION Development and Parks Planning
DEPARTMENT CDDS

SUBJECT **Hanlon Creek Business Park – Tender / EIR Amendment Landscape Drawings - Comments by Parks Planning and Operations**

Parks Planning and Operations have reviewed the draft tender set dated February 2009. Comments apply to all drawings unless otherwise noted.

1. Where the following species are proposed within 20m of: trails; other pedestrian areas; roads; fencing or other vulnerable structures or development lots, please remove:
    - *Populus deltoides*
    - *Populus tremuloides*
    - *Ulmus Americana*
    - *Salix exigua*

    The concerns with these species include: short lifespan, weak wood or aggressive suckering which could pose a future risk to pedestrians due to tree failure, cause infrastructure damage, obstruction or high level of maintenance. In areas with no infrastructure and no intended pedestrian use which are meant to naturalize these species are acceptable.

    Possible substitutions which would be acceptable:
    - *Acer saccharum*
    - *Acer saccharinum*
    - *Celtis occidentalis*
    - *Ostrya virginiana*
    - Others as appropriate to site conditions and EIR objectives which do not pose the concerns above. I suggest emailing me the revised list prior to drawing edits to expedite this.

2. Figure L-01 / notes list:
    - Add standard landscape notes (example attached), particularly: general notes including contractor responsibilities; seeding procedures including default seed mix for any disturbed areas not noted on plans and target percent coverages and seeding rates for all mixes and Annual Oats; planting notes including plant standards and treatments; tree preservation notes.
    - Under “Natural Area Buffers (beyond fencing)”: suggest a track rather than regular skid steer to minimize compaction

3. Figure L-01 / deciduous and evergreen tree planting details: remove references to t-bars; use only 50x50mm timber stakes. (In case any stake removals are missed by the contractor; our staff can easily cut off stakes by hand rather than use equipment

to remove bars in sensitive areas).

4. We have concerns about the proposed plantings on the gas easement (L-02, L-11) re: permission for plantings from gas company; if so, ensure plantings conform to any approved species list/types. Please minimize likelihood of City having to rectify damage to plantings caused by gas company work in the area. Confirm with gas company and amend drawings as needed.

5. Drawings are hard to read: suggest adding swale centrelines, property lines and streams to the drawing legends, and swm numbers to plans.

6. Please indicate any tree planting in the street rights of way occurring in this phase. My understanding, as per our engineering plan review meeting, of street tree planting locations:

    - One row of trees along Roads A and D – 4 lanes / 26m wide portion
    - Two rows of trees along Road D – 36.5m wide portion (not in contract – to be installed with Laird interchange work)
    - Two rows of trees on all minor roads (20m wide), including Tanner and Teal
    - One row of trees along Downey Rd - east side

Helen White
Parks Planner

Development and Parks Planning
CDDS
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C Rowland Cave-Brown-Cave, Randy Drewery

File T:\ParksPlanning_Park Planning\PLANNING\SOUTH DISTRICT\Subdivisions\Hanlon Creek Business Park\Landscape Plans\Tender landscape plan comments.docx

August 21, 2009

Ken Cornelisse
Planning and Information Management Supervisor
Ministry of Natural Resources
Guelph District Office
1 Stone Road West, 1st Floor
Guelph, ON N1G 4Y2

Dear Mr. Cornelisse:

RE: Salamander Protection Measures Plan
Hanlon Creek Business Park – Road 'A' Culvert Project

Further to our meeting of August 14, 2009 with the Ministry of Natural Resources (MNR) staff and Dr. Jim Bogart, we are pleased to submit this Salamander Protection Measures Plan for the Road 'A' Culvert project located in Phase 1 of the Hanlon Creek Business Park (HCBP).

The purpose of the Salamander Protection Measures Plan is to address concerns related to the protection of potential Jefferson salamanders in the vicinity of the Road 'A' Culvert area during construction. The Salamander Protection Measures Plan is based on discussions during the August 14, 2009 meeting to best anticipate and address potential Jefferson salamander movements in the vicinity of the culvert construction area. We greatly appreciate the input provided by MNR staff and Dr. Bogart in this regard.

Salamander Protection Measures Plan

The timing of the Road 'A' culvert construction overlaps with the timing of potential dispersal of juvenile salamanders from their breeding ponds, and it is this potential dispersal that is the focus of the Salamander Protection Measures Plan. It is understood that the Jefferson salamander travels at night during rainfall events and they may use vegetative or other debris as cover to hide during the daytime. As such, the most effective form of protection of the Jefferson salamander juveniles during construction of the Road 'A' Culvert is to 1) ensure that any juveniles do not inadvertently enter the construction area in the immediate vicinity of the Road 'A' Culvert, and 2) ensure that the construction access road remains free and clear of any vegetative or other debris that may cause the Jefferson salamander to remain on the access road during the daytime.

.../2

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Specifically, the Salamander Protection Measures Plan for the Road 'A' Culvert construction consists of the following:

1) Isolation of the construction area during a "dusk to dawn" timeframe (from 30 minutes before sunset to 30 minutes after sunrise) when Jefferson salamander juveniles are most likely to be moving from breeding ponds to foraging or overwintering areas. This will be achieved by installing and maintaining silt fencing around the construction area as shown on drawing 110095-SK1.

2) A section of the silt fence at the access road from McWilliams Drive will be removed just before the start of construction each morning. This section of silt fence will be re-installed with the bottom keyed into the ground as detailed on drawing 110095-SK1 at the end of each work day.

3) Construction activities and vehicular usage of the access road will be restricted to the time period of 30 minutes after sunrise to 30 minutes before sunset.

4) Access to the site, including both vehicular and any pedestrian traffic, will be limited to the existing construction access road from McWilliams Drive.

5) The construction access road will remain free and clear of any vegetative or other debris that may encourage salamanders to remain on the access road during the daytime. The access road will be inspected to ensure it is clear of debris at the start of the work day before usage of the access road begins, and at the end of each work day once usage of the access road has ceased.

6) When rain is forecasted at night, the Environmental Inspector for the project will inspect the site before the end of the work day to ensure all mitigation measures have been implemented and are functioning properly.

We trust that the above Salamander Protection Measures Plan is consistent with what was discussed at the Friday, August 14, 2009 meeting.

.../3

Should you require any additional information or clarification, or if you would like to visit the site, please contact me at (519) 822-1260 ext. 2282.

Sincerely,

Colin Baker, P.Eng.
Environmental Engineer

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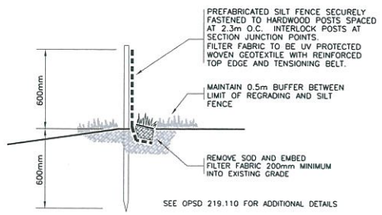
CB/kgb

C Karolyn Pickett, MNR
Dr. Jim Bogart, University of Guelph
Peter Cartwright
Rajan Philips
Suzanne Young
Dave Stephenson, NRSI
Tara Benton, NRSI
Jessica Grealey, NRSI
Rick Clement, AECOM

File # 16.212.0922

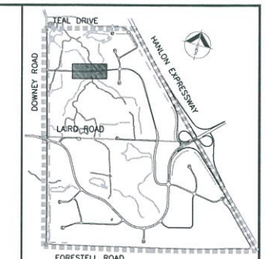
PROTECTED AREA CONSTRUCTION AREA



DETAIL SILT FENCE — 1
NOT TO SCALE

GENERAL NOTES:

1. SALAMANDERS TO BE KEPT OUT OF THE WORK AREA BY COMPLETELY ENCLOSING THE WORK AREA USING SILT FENCE. SILT FENCE TO BE KEYED INTO THE GROUND AS SHOWN ON THE DETAIL. THE SECTION ACROSS THE ACCESS ROADWAY TO BE REPLACED AT THE END OF EACH WORK DAY WITH THE BOTTOM KEYED INTO THE GROUND.
2. TO ENSURE THERE ARE NO SALAMANDER INJURIES ON THE ACCESS ROADWAY, VEHICLES WILL ONLY BE ALLOWED ACCESS FROM 30 MINUTES AFTER SUNRISE TO 30 MINUTES BEFORE SUNSET.
3. THE ACCESS ROADWAY IS TO BE KEPT CLEAR OF ANY TYPE OF DEBRIS THAT A SALAMANDER COULD HIDE UNDER, SUCH AS LEAVES, PLYWOOD, BRUSH, LOGS, ETC. ROAD TO BE INSPECTED TO ENSURE IT IS CLEAR OF DEBRIS AT THE END OF EACH WORK DAY AND AT THE START OF EACH WORK DAY PRIOR TO USAGE.
4. AFTER CONSTRUCTION ON THIS CONTRACT IS COMPLETE, THE ACCESS ROADWAY SHALL BE RESTORED BY REPLACING THE TOPSOIL AND APPLYING SEED AND MULCH.



KEY PLAN
Scale : NOT TO SCALE

GENERAL NOTES:

ALL WORK IS DONE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF ONTARIO PROVINCIAL STANDARDS AND THE CITY OF GUELPH AND THE REGION OF WATERLOO AND AREA MUNICIPAL GUIDELINES AND SUPPLEMENTAL SPECIFICATIONS FOR MUNICIPAL SERVICES (OCSSMS), EXCEPT WHERE NOTED.

PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ALL BENCHMARKS, ELEVATIONS, DIMENSIONS AND GRADES MUST BE CHECKED BY THE CONTRACTOR AND ANY DISCREPANCIES REPORTED TO THE ENGINEER. AT LEAST TWO DIFFERENT BENCHMARKS MUST BE REFERRED TO AT ALL TIMES.

ALL CONCRETE IS 32MPa IN 28 DAYS, WITH 6% +/- 1% AIR ENTRAINMENT UNLESS OTHERWISE STATED.

THE CONTRACTOR SHALL NOTIFY THE CITY OF GUELPH AND THE ENGINEER AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

CONTRACTOR TO SUPPORT AND PROTECT EXISTING UTILITIES DURING CONSTRUCTION TO THE SATISFACTION OF THE UTILITY COMPANY.

BENCH MARK

CITY OF GUELPH BM#204 - TABLET ON BASE OF HANLON INDUSTRIAL PARK SIGN LOCATED ON THE EAST SIDE OF THE HANLON EXPRESSWAY AT THE LAIRD ROAD INTERSECTION.
GEODETIC ELEVATION = 332.685m

IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO INFORM THEMSELVES OF THE EXACT LOCATION OF, AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES, SERVICES AND STRUCTURES WHETHER ABOVE GROUND OR BELOW GRADE BEFORE COMMENCING THE WORK. SUCH INFORMATION IS NOT NECESSARILY SHOWN ON THE DRAWING, AND WHERE SHOWN, THE ACCURACY CANNOT BE GUARANTEED.

WITH THE SOLE EXCEPTION OF THE BENCHMARK(S) SPECIFICALLY DESCRIBED FOR THIS PROJECT, NO ELEVATION INDICATED OR ASSUMED HEREON IS TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

ALL DIMENSIONS AND INFORMATION SHALL BE CHECKED AND VERIFIED ON THE JOB AND ANY DISCREPANCIES MUST BE REPORTED TO THE CONSULTANT BEFORE COMMENCING THE WORK. DRAWINGS ARE NOT TO BE SCALED.

No.	DATE	DESCRIPTION	BY:	CHKD.

ISSUES/REVISIONS

CORPORATION OF THE CITY OF GUELPH 1827

ENGINEERING DEPARTMENT

AECOM

HANLON CREEK BUSINESS PARK SALAMANDER MITIGATION MEASURES

HANLON CREEK BOULEVARD
TRIBUTARY A CROSSING

DESIGNED BY:	APPROVED BY:

SCALE:	CONSULTANT DRAWING No.
N.T.S.	110095-SK1
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COUNCIL REPORT

TO	**Guelph City Council**
SERVICE AREA	Community Design & Development Services and Economic Development & Tourism Services
DATE	October 26, 2009
SUBJECT	**Hanlon Creek Business Park – Council Request to the MNR**
REPORT NUMBER	09-90

RECOMMENDATION

"THAT the Community Development and Design Services and Economic Development and Tourism report dated October 26, 2009, with respect to the Hanlon Creek Business Park – Council Request to the MNR, BE RECEIVED; and

"THAT Council request the Minister of Natural Resources for confirmation that the comprehensive Jefferson salamander monitoring program, that the City will be undertaking in consultation with the Guelph District Office of the Ministry of Natural Resources and Dr. Jim Bogart, between March and May of 2010, would be sufficient to determine the presence or absence of Jefferson salamander habitat within the Hanlon Creek Business Park; and

"THAT Council request the Minister of Natural Resources, if no Jefferson salamander habitat is established as a result of the 2010 monitoring program, to confirm that the Ministry of Natural Resources will not object to the City proceeding with the development of the Hanlon Creek Business Park as an approved plan of subdivision under the Planning Act; and

"THAT Council further request the Minister of Natural Resources, if the presence of Jefferson salamander habitat is established as a result of the 2010 monitoring program, to allow the City to enter into an agreement with the Minister even after the June 30, 2010, deadline for agreements as currently provided in the Ontario Regulation 242/08, in order for the development of the Hanlon Creek Business Park to proceed along with the implementation of a mutually agreed upon mitigation plan to minimize adverse impacts of development on the Jefferson salamander habitat; and

"THAT Council inform the Minister of Natural Resources that the City, in consultation with the MNR Guelph District office and independent of the 2010 monitoring program, is planning to carry out interim works in specific areas within the Hanlon Creek Business Park that are of no risk to any potential Jefferson salamander habitat within the Park;

"AND THAT the Mayor write to the Minister of Natural Resources, Guelph MPP Liz Sandals, and MNR Guelph District Office Manager to convey Council's resolution and the background and circumstances thereto, as outlined in this report."

REPORT

The Hanlon Creek Business Park (HCBP) subdivision plan is based on ten years of studies, investigations, agency reviews and approvals. The subdivision plan was approved by City Council on February 21, 2005. Further to appeals, the plan was approved by the Ontario Municipal Board (OMB Decision No. 3143) on November 8, 2006.

Following the OMB approval, the City has prepared a comprehensive Environmental Implementation Report (EIR) as well as the design of municipal services and stormwater management facilities for the first two phases of the subdivision. The required approvals from the Grand River Conservation Authority (GRCA) and the Ministry of the Environment (MoE) were received and the construction of Phase 1 and Phase 2 services was set to begin in 2009.

However, work has been delayed following the discovery of a dead Jefferson salamander complex on April 20, 2009, during an amphibian road mortality survey on the existing Laird Road. Jefferson Salamander is one of the threatened species listed in O.Reg. 230/08 made under the Endangered Species Act of 2007 (ESA). The main purpose of the legislation is to protect species that are at risk and their habitats. Infrastructure and development activities, insofar as they are likely to harm species at risk, or damage or destroy their habitats, can proceed only pursuant to an agreement with the Minister of Natural Resources, or a permit issued by the Ministry of Natural Resources.

O.Reg. 242/08 includes a transition provision exempting development and infrastructure activities, including approved plans of subdivision, from the application of the ESA provided these activities have received their respective approvals before June 30, 2008, and the proponents of these activities have entered into an agreement with the Minister of Natural Resources before June 30, 2010, "to take reasonable steps to minimize adverse effects on the species."

The HCBP subdivision received OMB approval on November 8, 2006, and falls under the above-noted exemption category. However, for the City to enter into an agreement with the Minister, the presence of Jefferson salamander habitat within the HCBP needs to be established through a monitoring process. As the monitoring process and analysis cannot be completed before July, 2010, the City will not be able to meet the current deadline of June 30, 2010, to reach an agreement.

The main purpose of Council's request to the Minister of Natural Resources, as recommended in this report, is to allow the City to enter into an agreement with the Minister even after the June 30, 2010, deadline, if the 2010 monitoring process establishes the presence of salamander habitat within the HCBP lands.

In addition, as recommended in this report and discussed below, the City is also requesting the Minister for certainty in regard to the monitoring process, and for confirmation that if no salamander habitat is established at the end of the

monitoring program in 2010, the Ministry will not object to the City proceeding with the development of the HCBP as already approved.

Monitoring Process

Salamander monitoring is undertaken generally between the months of March and May. If salamander 'presence' is established during monitoring and subsequent analysis, it would be possible to delineate habitat areas and develop mitigation or enhancement measures. However, the more difficult challenge is to establish 'absence', and there appears to be no firm guidelines as to how many seasonal monitorings should be undertaken to prove 'absence'. The 2009 Draft MNR Study on Jefferson Salamander as part of the Ontario Recovery Strategy Series, recommends a 3-year monitoring program to demonstrate salamander 'absence'. But it is not clear if this is a general recommendation for guidance, or if it should apply to every situation.

In the case of the Hanlon Creek Business Park, Natural Resources Solutions Inc (NRSI), the City's Environmental Consultants, undertook salamander trap surveys during the spring of 2009. Monitoring methodologies were undertaken in consultation with MNR staff and Dr. Jim Bogart. NRSI followed recommended protocols that were also being used in other monitoring sites in Wellington County, Puslinch Township, and the City of Kitchener. While the presence of Jefferson salamander complex was confirmed in Kitchener sites, the monitoring exercise did not find any evidence in the HCBP or surrounding areas. The discovery of the dead salamander on Laird Road came after the salamander monitoring process had been concluded, during the subsequent amphibian mortality survey. Additional investigations, including further assessment of potential breeding habitat and larval surveys, were undertaken by the consultants with directions from MNR staff in June and July, 2009. No evidence of salamander presence was found.

MNR Guelph District staff have expressed the view that the 2009 results were not conclusive and that additional monitoring is necessary to confirm the presence or absence of Jefferson salamander within the HCBP. The City is now preparing to undertake monitoring again in 2010.

At the August 14, 2009, meeting attended by Dr. Bogart, MNR and City staff, and NRSI. Dr Bogart, who is the Chair of Jefferson Salamander Recovery Team and a contributing author of the draft Recovery Strategy for Jefferson Salamander in Ontario, stated that with a comprehensive and properly performed assessment in 2010, to target adult individuals, it would be possible to establish presence or absence of Jefferson salamander habitats within the HCBP.

NRSI and City staff are currently preparing the monitoring program for 2010 in consultation with Dr. Bogart and MNR staff. The broad parameters of a comprehensive monitoring program were identified at the September 23, 2009, meeting between MNR and City staff and consultants. On October 1, Dr. Bogart, accompanied NRSI Biologists and the City Environmental Planner on-site to review existing conditions and identify potential salamander breeding habitat. Based on comments received from MNR staff, Dr. Bogart's and NRSI's first hand knowledge of the site an extensive monitoring program, which will include 3 km of drift fencing, 500 pitfall traps and 86 minnow traps, is being prepared by NRSI. Written guidelines for carrying out physical monitoring will be prepared in advance and

included in the Plan. The entire monitoring plan will be finalized in consultation with MNR Guelph District staff and Dr. Bogart.

The City would like to have confirmation that based on Dr. Bogart's opinion and the comprehensive monitoring program that will be undertaken in 2010, the results obtained from the 2010 monitoring program would be sufficient to determine the presence or absence of Jefferson salamander within the HCBP. If no evidence of Jefferson salamanders or suitable habitat is found, the Ministry of Natural Resources should confirm that the Ministry has no objection to the City proceeding with the development of the Hanlon Creek Business Park as already approved under the Planning Act.

The City of Guelph fully supports the "precautionary principle", the central premise of the ESA which states that "where there is a threat of significant reduction or loss of biological diversity, lack of full of scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat." City staff and consultants have consistently proposed as a positive extension of this principle to incorporate reasonable mitigating features in the design of the subdivision based on the identification of potential salamander habitats within the HCBP.

Even while proceeding with the development of the HCBP as already approved, if no salamander habitat is established as a result of the 2010 monitoring process, the City will work with MNR Guelph District Office and Dr. Bogart in regard to carrying out design and construction activities in the vicinity of areas that could potentially be a salamander habitat. On the other hand, if Jefferson salamander habitat is established through the monitoring process, the City should be allowed to proceed with development under an agreement with the Minister, as discussed below.

Agreement Process

As noted earlier, the City will not be able to meet the June 30, 2010, deadline for entering into an agreement under the transition provision of O. Reg. 242/08. Given that the City has already undertaken salamander monitoring in 2009, and that the second year monitoring in 2010, that is being undertaken at the request of the MNR, cannot be completed before June 30, 2010, it is reasonable to request the Minister for an extension of the deadline for entering into an agreement in the event a salamander habitat is established within the HCBP.

The Hanlon Creek Business Park subdivision has gone through extensive public consultation, design review and approval processes and is ready for construction. City staff and consultants are confident that adequate salamander mitigation measures can be incorporated in the HCBP design if salamander habitat is established within the HCBP. They are also confident that the City would be able to meet the requirements for an agreement as envisaged by O.Reg. 242/08.

Interim Works

As Council is aware, the City is working with the MNR Guelph District office to carry out a number of interim works in the HCBP, independent of the monitoring program. The projects and their status are as follows:

- Hanlon Watermain and Utilities Crossing: This involves tunnelling under the Hanlon Expressway at the Clair Road alignment for watermain and utilities crossing. MNR has allowed this work to proceed. The work will commence in November, 2009, and will be completed by April, 2010.

- Servicing Projects: Three independent servicing projects have been identified in the north-western, northern and eastern parts of HCBP Phase 1. They are currently being reviewed by MNR. The City plans to commence construction work in these areas from January, 2010.
- Laird Road Culverts: Laird Road was closed in the evenings, for ten days, in September 2009, to allow for the safe passage of migrating amphibians. In order to avoid closing Laird Road again between March and June in 2010, the City will be installing drift fencing and traps on either side of Laird Road as part of the overall network of fencing and traps installed for salamander monitoring. The installation of fencing and traps will be undertaken during the month of November, 2009, and this arrangement is acceptable to MNR staff.

The City would like to inform the Minister of Natural Resources that in undertaking the proposed interim works, the City is making every effort and expending resources to keep the HCBP project moving forward while working with Ministry staff to meet the requirements of the Endangered Species Act.

Other Considerations

It is also necessary to emphasize the community, environmental, economic and investment contexts that make the Hanlon Creek Business Park development somewhat unique not only in Guelph but also in south-western Ontario.

The HCBP development is the centrepiece of Guelph's environmental stewardship and economic development. As a source of employment lands, this development is critical to Guelph's Local Growth Plan and to the Provincial Growth Plan projections pertaining to south-western Ontario. The subdivision plan provides for the integration and enhancement of the central habitat and wetland complex within the development lands. A hierarchy of transportation connections involving the adjacent Hanlon Expressway, internal roads, trails and bikeways are included to provide multimodal access for community, business and recreational uses. Services will be installed within the road allowances, while onsite design will ensure low impact development, groundwater recharge, and stormwater management to sustain the natural watercourses.

Full development also involves considerable investments. The servicing cost for Phases 1 and 2 is estimated to be $30M, and another $10M cost is anticipated for Phase 3 servicing. Of additional infrastructure investments, $1.5M has already been spent on interim improvements to the Hanlon Expressway intersections at Laird Road and Clair Road. The watermain and utilities crossing, noted above, will cost $1.8M. The Environmental Assessment for upgrading the at-grade Hanlon/Laird intersection to a new interchange has been approved by the Minister of the Environment. The Ministry of Transportation can now proceed with the design and construction of the new interchange at an estimated cost of $20M. The City is collecting Development Charges to pay its share of the cost of the new interchange that is being given priority to accommodate developments within the HCBP and on lands to the east of the Hanlon Expressway.

The City should emphasize the importance of the social, economic, environmental, and investment factors associated with Hanlon Creek Business Park development in order for the Ministry of Natural Resources to arrive at an informed and proportionate decision balancing the objectives of the Endangered Species Act and the Provincial and Local Growth Plan objectives. The recommended requests to the Minister of Natural Resources are reasonable requests and appropriate to the background and circumstances associated with the development of the Hanlon Creek Business Park.

If Council approves the recommended resolution, staff would prepare the letter from the Mayor to the Minister of Natural Resources, incorporating the Council resolution and attendant circumstances as outlined in this report.

CORPORATE STRATEGIC PLAN

Goal 3: A diverse and prosperous local economy

FINANCIAL IMPLICATIONS

As discussed in this report.

DEPARTMENTAL CONSULTATION

Economic Development and Tourism Services
Community Design and Development Services
Legal Services

COMMUNICATIONS

N/A

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October 28, 2009

The Honourable Donna Cansfield
Minister of Natural Resources
Ferguson Block 3rd Floor
77 Wellesley St. W.
Toronto, Ontario
M7A 1Z8

Dear Minister Cansfield.

Re: Hanlon Creek Business Park – Council Request to the Ministry of Natural Resources

I would like to share with you the resolution unanimously passed by City Council on October 26, 2009, concerning the development of the Hanlon Creek Business Park in light of the requirements of the Endangered Species Act. The full resolution is included in the attached report and we trust that our request for greater certainty in regard to proceeding with this development will receive your earnest consideration.

As outlined in the report, the City fully supports the objectives of the Endangered Species Act (ESA) and City staff and the City's consultants have been working with staff from the Ministry of Natural Resources (MNR) Guelph District Office and Dr. Jim Bogart to develop a process for proceeding with the Hanlon Creek Business Park (HCBP) development in the context of the ESA.

The City appreciates MNR staff cooperation in identifying areas where interim servicing work could be undertaken with minimal risk to potential Jefferson salamander habitat within the HCBP. To date, three areas of work have been identified in addition to the culvert crossing work that the City had to stop this year but will restart after July 1, 2010.

The City and its consultants are also preparing an extensive salamander monitoring program in consultation with Dr. Bogart and MNR staff. This program will be undertaken in the spring of 2010, and the City would like to have confirmation from the MNR that the 2010 monitoring work would be sufficient to establish the presence or absence of Jefferson salamander

habitat within the HCBP. Our request is based on the knowledge of experts involved in this project and their familiarity with site conditions, in addition to Dr. Bogart's expressed opinion on this matter.

As indicated in the Council resolution, if no salamander habitat is identified at the end of the monitoring program, the City would like to proceed with the development of the subdivision as already approved by the Ontario Municipal Board in November, 2006. On the other hand, if salamander habitat is established, the City would like to proceed with development work under the 'agreement process,' as currently provided in O.Reg. 242/08. Our request to you in this regard is to allow the City to enter into an agreement with the Ministry even after the stipulated deadline of June 30, 2010, as it will not be possible for the Ministry and the City to finalize an agreement before this deadline. In considering this request, I would sincerely ask you to take into account the long history of studies, investigations, agency reviews and approvals that the HCBP subdivision has gone through.

Lastly, significant community, environmental, economic and infrastructure investments are involved in this project which is of importance not only for the Local Growth Plan objectives in Guelph but also for Provincial Growth Plan objectives in southwestern Ontario. These factors must also be taken into account while considering the City's request for greater certainty in proceeding with the development of the Hanlon Creek Business Park in the context of the Endangered Species Act.

Thank you for you consideration of Council's requests.

Sincerely,

Karen Farbridge
Mayor

Attach: (Council Resolution and Report)

cc: Liz Sandals, MPP, Guelph
Ian Hagman, Guelph District Manager, MNR
Dr. Jim Bogart, University of Guelph

GRCA Correspondence/Comments

Grand River Conservation Authority

Technical Review

GRCA FILE: Hanlon Creek Business Park, Guelph
To: Fred Natolochny
From: John Palmer
Date: 27 November 2008
RE: HCBP Stream Temperature Impact Report Review

Background:

The modelling applies a continuous water balance, using 8 years of meteorological data, to reflect variations in water temperature caused by daily and seasonal variations in solar radiation, precipitation and ambient temperature.

The modelling platform used, HSPF, is USGS's Hydrologic Simulation Program – FORTRAN. This is a complete hydrologic and hydraulic program capable of modelling catchments channels and reservoirs for water quality using quite realistic physical representations (far more so than programs such as OTTHYMO and MIDDUS). It is generally used to assess the impact of land use changes on point or non-point source treatment alternatives.

HSPF is a sophisticated program with 100's of process algorithms. The water balance function tracks all fluxes and storages over time using physical and empirical science that Otthymo and MIDUSS are incapable of. There may be debate over whether it is as physically complete a model as GAWSER but I believe it to be sophisticated enough to be suitable for the task at hand.

Equations for infiltration are based on the work of Philip (1957) which uses an analytical approach rather than use of an empirical methods such as the SCS Curve Number approach, Holtan's Equation and the Horton Equation none of which are capable of tracking soil moisture content on a continuous basis (the City of Guelph has used the Horton Method extensively in subdivision hydrology).

First the model was calibrated against 2006 and 2007 flow data with adjustment of infiltration, interflow, interception, evapotranspiration and groundwater flow to produce a water balance. Next the model was calibrated to observed stream temperatures using parameters related to shading, convective heat transfer between air and water and conduction between water and ground.

Comments:

We had previously accepted the use of an event based model to satisfy the requirement to provide estimates of the magnitude, duration, spatial extent and frequency of occurrence of elevated stream temperatures during summer months in Hanlon Creek Tributary A. We have now reviewed the current stream temperature impact report based on the use of a continuous-in-time model. We accept the continuous model for the purpose of stream temperature analysis. The results of continuous stream temperature modelling as presented do demonstrate that it may be feasible to improve existing conditions through removal of the on-line pond and increased canopy cover.

We are providing comments that we trust will allow for refinement of the analysis. Recognizing that the submitted stream temperature impact report will be used to justify reliance on the proposed mitigation measures to adequately protect a small stream from thermal pollution when subject storm water runoff from large highly impervious catchments, we support the adaptive

management approach being suggested. We believe that it is possible to develop the subject lands such that exceedance of in stream target temperatures will be prevented and aquatic habitat may be improved through increased baseflow between rainfall events.

We anticipate regular updating of the modelling to reflect monitoring of mitigative measures, appropriate use of these updates to control the extent and timing of construction phases, and if necessary implementation of additional mitigative measures to reduce reliance on the stormwater management facilities.

Following detailed review of this report we offer the following engineering comments:

1. Please investigate the impact of assuming an effective 45% imperviousness when modelling developed lands. Although it is clear that diversion of runoff from 40% of catchments impervious surfaces (roofs) to infiltration galleries reduces minor system flows, the assumption of 45% effective imperviousness does create water balance uncertainties that could otherwise be properly accounted for in HSPF, a sophisticated program which accounts for all elements of the hydrologic cycle.

   Given HSPF's capabilities to physically represent the proposed development fabric we suggest that catchments now be discretized and modelled to simulate continuous hydrologic responses. Realistically this requires catchments to include infiltration trenches, sized for recharge targets, and diversions that direct excess roof runoff to the stormwater conveyance system during major events.

2. We recommend that a sensitivity analysis be carried out on the level of imperviousness to account for the possibility of some infiltration galleries having reduced performance over time and some not being adequately maintained.

3. Section 3.4 reports that a sensitivity analysis was undertaken to establish the impact of changing key heat transfer variables and that this information was used to establish a parameter set that best fit measured data in each stream reach. For those parameters that are subsequently changed in the developed condition we suggest that these also be subject to another sensitivity analysis with selected values presented in a manner that shows the impact of parameter variance on stream temperature.

4. Table B-3 lists the CFSAEX shading parameter used in the computation of heat flux from incoming short wave radiation for each reach of Hanlon Creek Tributary A and for the SWM ponds. How feasible is the increase in shading to 90% cover of the stream surface in most reaches from as little as 5% in the most exposed reach? It is recommended that an analysis of the efficacy of mitigative measures, including the maturity of vegetation used for shading, be carried out for various stages of development and used to guide phasing such that the extent of construction at any one time does not overwhelm the ultimate performance of any implemented mitigative measures.

5. We acknowledge that logical parameter selection techniques have been used to ensure that simulated results fit reasonably with observed data under existing conditions. However, when simulating future conditions, there are no observed data directly applicable to the simulation of temperature in SWM ponds and cooling trenches, a situation which leads to uncertainty in the accuracy of simulated stream temperatures. Further, as there is little supporting thermodynamic science that can be quantitatively applied to SWM ponds, the greatest potential source of thermal pollution, we feel that it is necessary to explain how the discharge temperature from the proposed SWM facilities, with bottom-draw pipes and cooling trenches, can be adequately represented by HSPF's relatively simple Streambed Conduction Equation. If it can be demonstrated that the Stream Bed Conduction Equation can be used conservatively to simulate heat transfer

between water in a SWM facility and the underlying ground, then we suggest that the coefficients of heat conduction (KMUD values), a critical parameter controlling the magnitude of heat transfer, be subject to sensitivity analysis.

6. The obvious potential for a small cold water stream to be overwhelmed by warm water displaced from stormwater ponds that collect runoff from lands that will have a very high level of imperviousness, prompts us to suggest that analysis of volumes at specified temperatures, that may be displaced be provided.

7. To reduce the reliance on the model and to add resiliency to the mitigation measures proposed, we encourage investigation of additional measures that reduce reliance on end-of-pipe controls. Among these you may wish to consider:

   Shading of the stormwater conveyance swales,
   Infiltration galleries within the stormwater conveyance swales,
   Pervious pipe storm sewers (the Etobicoke system),
   Underground storage vaults in selected blocks could be considered to reduce inflows to the stormwater ponds.
   Using high convective heat transfer coefficient concrete pipe in storm sewers instead of PVC or HDPE pipes.

8. We support the proposed adaptive management approach in the report's conclusions and recommendations. In particular the proposed monitoring within the ponds and stream needed to identify the function of each mitigative measure. In addition we suggest that:

   1) The entire management scheme be revisited between development phases.

   2) That the monitoring plan now provide specifics of how the proposed mitigation measures will be assessed.

   3) The monitoring and assessment protocol should enable confirmation of the existence of temperature stratification and associated thermoclines, as well as the contribution of groundwater flow and temperature mixing in the ponds and cooling trenches.

   4) The location of data loggers needs to be mapped and sampling frequency identified.

   5) That the monitoring plan become a component of a scholarly research program of sufficient duration to advance the science of thermal enrichment modelling in a meaningful way and to provide practical guidance for the design of mitigative measure in future development proposals. GRCA stands willing to collaborate with academic, municipal, provincial and consultancy partners in the establishing and conducting the suggested research program and investigating the feasibility of including this into another update of the State of the Hanlon Creek Watershed Report.

9. Please supply annotated HSPF input and summary output files for each development scenario.

10. Please provide catchment maps that reflect the model schematics given in Figures 3.1 and 3.2.

11. Please explain the percent imperviousness values applied to the catchment areas of Figure 3.2.

12. In Table B-1 the calibrated infiltration rate values for organic soils at 15 to 45mm/hour seem to be quite high (contrary to normal logic they are even higher than those used for sandy soils).

13. There may be discrepancies in Figures C-11. The title is for the maximum 7-day future unmitigated condition with removal of the on-line pond however the on-line pond included in the chart. Also this figure has higher temperatures in all reaches than is the case with Figure C-10 which represents the same future development condition with the on-line pond still in place.

December 15, 2008

Mr. Rick Clement, P.Eng.
TSH
Suite 202, 72 Victoria Street South
Kitchener, Ontario
N2G 4Y9

Dear Mr, Clement:

Re: **Hanlon Creek Business Park, Environmental Implementation Report and Water Temperature Modelling, City of Guelph, Subdivision Application File 23T-03501**

We had recently, December 9, 2008, been provided with a memo from Andrew Schiedel, Natural Resource Solutions Inc. detailing the temperature targets being proposed. The following three comments are provided on the proposed targets. They are also re-iterated in the general comments on the Environmental Implementation Report.

1. Page 20; 7.4 deg C would appear to be high based on the fact that survival sharply declines from 7.4 to 8 deg C. Please clarify.

2. Page 21; it was noted that for juvenile brook trout, a water temperature of 18 deg C or above would be detrimental except for periods of short duration. One would expect that the optimum temperature range would then be between 10 and 18 deg C and <u>not</u> between 10 and 19 deg C.

3. Literature indicates that 24 deg C is considered lethal – having this as the upper limit for SWM discharge temperature does not "avoid lethal temperatures". The upper limit / maximum for SWM discharge to avoid lethal effects on brook trout should be below the literature cited lethal temperature.

The following comments have been provided by our technical review staff on the Environmental Implementation Report. The comments on the continuous water temperature model previously issued have not been included with these comments. Please consider the comments and provide an answer or confirmation of the points.

<u>Engineering Comments:</u>

Hydrology

1. In general we find the hydrologic modelling to be conservatively used and appropriate for the design of SWM ponds in terms of standard quality and quantity controls. In terms of thermal enrichment mitigation please refer to the attached technical memorandum of November 27, 2008.

2. Section 2.1.1 of the SWM report sets a limit of 180 l/s/ha runoff from blocks draining to Ponds 2 & 4. How has this limit been established?

SWM Ponds

3. The design of Pond-3, by Block 15, does not provide for adequate settling of sediment, particularly for the drainage conveyed from Laird Road. We recommend consideration of options such as a forebay or an oil and grit separator.

4. We support the use of cooling trenches at SWM facility outlets but have concerns for the apparent sizing of these structures without any design analysis. We do however understand that a general lack of supporting literature and monitoring data within the industry makes it difficult to confirm the performance of cooling trench designs at this point in time. Given these observations we reiterate a prior comment that cooling trenches are not considered effective without deep cover, shading and mixing with cooler groundwater and further that without these conditions the proposed cooling trenches will not have sufficient contact time to meet required cooling targets

5. Please see the temperature modelling technical review for related comments regarding sensitivity analysis, monitoring and adaptive management for further commentary on temperature mitigation measures.

6. Trench designs need to ensure that the design flows will be conveyed subsurface under the full range of anticipated groundwater elevations. In the design details it appears that high groundwater elevations can result in bypassing at cooling trench inlets.

Grading Plans

7. For Block 15 we recommend that the grading plan direct drainage to Pond-3's inlet swales and not as sheet flow distributed along the edge of the pond.

8. Please identify swale geometries on all grading plans (only one grading plan appears to have this information).

Erosion and Sedimentation Controls:

We are pleased to see the use of distributed siltation basins but do have some concerns for basin designs and conveyance control measures as listed in the following comments:

9. To improve the ability of final SWM facilities to adequately capture and settle sediment, if and when upstream controls fail, we recommend that interim baffling be added to these facilities. The use of turbidity curtains around pond outlets and to create additional pond cells may satisfy this concern.

10. We note extensive use of straw bales reduce runoff velocities in the in the stormwater swales. As these are prone to undermining and flanking we recommend consideration of Rock Check Dams or Ditch Chexx as a substitute. Ditch Chexx, a relatively self-healing measure, are described in Appendix C-46 of the ESC guideline - further information is available from Filtrexx Canada (http://www.filtrexx.ca/).

11. Side slopes above permanent pool lines of each settling basin should be stabilized with vegetation once excavation is complete.

12. We recommend use of a heavy duty silt fence around the PSW in Blocks 42 and 43.

13. Where heavy duty silt fence is used it can be implemented more reliably by burying the bottom 2 strands of the paige-wire. Please add a suitable note to the silt fence detail.

14. Please associate an Erosion and Sediment Control Sequencing Table with Drawings E7 to E12. This table should itemize a larger suite if controls to be used than the apparent reliance on only perimeter controls and a few temporary ponds (i.e. please consider additional stabilizing, conveyance and settling controls suited to large areas of disturbed lands near sensitive natural features).

15. Please provide supporting design information for the sediment basins shown in Drawings E10, 11 and 12. For these, we recommend consideration of design guidelines provided in Appendix C of the December 2006 Erosion and Sediment Control Guideline for Urban Construction (available form the GRCA website www.grandriver.ca, under the headings: Planning & regulations, Policies, permits & fees, Policies and forms).

16. ESC notes on the drawings should also specify seeding of topsoil piles.

17. For Block 15 we recommend that the ESC Plan include detention measures that are independent of Pond 3.

18. Drawing E01, referred to in the staging sequence table of Drawing E18, was not received.

19. It is not clear whether the rock check dams, in Drawing E13 & E18 details, will be notched to concentrate flows in the centre or that filter fabric will be raised laterally up swale side slopes. Please clarify.

20. Given the proximity of large areas of grading around sensitive natural features we recommend that the services of an independent Environmental Monitor be retained to ensure that due diligence is given to erosion and sediment control during all stages of development.

Recommended:

21. Is it feasible to take advantage of groundwater interception in SWM facilities to continually add cool water to the permanent pools?

22. It may also be feasible blend SWM facility discharge with groundwater in the cooling trenches prior to release to the creek.

23. In addition to temperature mitigation measures already described in the EIR and associated reports you may wish to consider the following:

    - Using concrete storm sewer pipes. These have high convective heat transfer coefficients resulting in more heat transfer to pipe walls than is possible with plastic pipes.
    - Establishing vegetative shading above cooling trenches and outlet pipes.

24. To avoid drawing sediment out of ponds, consider deepening pools in the vicinity of bottom draw pipes.

25. If it is determined that enhanced infiltration is required, and further that it is difficult to implement with only roof runoff only, then we suggest that permeable pavement be considered for parking areas within industrial blocks. Studies carried out by Seneca College, in conjunction with TRCA, show high degrees of water quality enhancement in runoff recharged through permeable pavement for all monitored parameters except salt. However, since permeable pavement has far better drainage, than with concrete or asphalt surfaces, freezing and the need for deicing is greatly reduced and in some cases may not be needed.

26. The temporary relief culvert shown in Drawing E18 does not appear to be necessary in Drawing B20?

27. Existing contour elevation labels are illegible on most drawings where these are shown.

28. Please update the HEC-2 hydraulic model for Tributary A to include the culvert proposed at the future Hanlon Creek Boulevard crossing.

Terrestrial Comments

1. The current EIR applies to Phase 1 and 2 portions of the property. Figure 1 (Study Area and Phase Layout) and Figure 4 (Restoration and Planting Plan) together provide a clear illustration of development phases and a general overview of terrestrial and wetland habitats listed in Section 1 of the EIR (See page 17). Figure 4 provides a clear basis for the long-term protection of a functional natural heritage system on this site. It is therefore imperative that the boundaries of core wetland features, in particular, be delineated on accompanying site and grading plans so that the recommendations of this EIR can be implemented in an efficient and effective manner. Staff note that wetland boundaries verified by the GRCA are either not plotted or labelled on some plans. Wetland boundaries should be clearly illustrated and labelled on relevant plans. In addition, development setbacks from wetlands will require some adjustment. Please see a listing of specific labelling issues at the end of these comments.

2. The installation of cooling trenches within woodlands and wetlands cannot be supported by GRCA staff as impacts associated with the proposed works have not been assessed in the EIS or EIR. Please revise site plans to ensure that stormwater outlets do not encroach within these natural areas.

3. A combination of passive and active restoration has been recommended for this site. However, staff note that detailed planting plans were not specified for open meadow and wetland/meadow marsh buffer areas (see EIR Figures 5A and 19). Please clarify if these areas will be subject to active or passive restoration. Restoration plans may require some modification to ensure that wetland species are planted in areas containing hydric soils and upland species are planted in areas with drier soils. For instance, white pine should not be planted within wetland areas.

4. GRCA staff are supportive of the general site plan recommendations on page 139 of the EIR (Section 15.0). Staff want to emphasize that trees and other areas of vegetation must be identified and delineated with temporary fencing located beyond the dripline of trees. This implies that the dripline of the woodland within which the Heritage Maple Grove is included should be delineated and protected with temporary fencing. Section 15.5 also states that "existing areas of natural vegetation will be retained wherever possible". Who will make this determination? Where will this take effect?

5. Staff agree that restoration of Laird Road should employ best management practices for wildlife, particularly within the vicinity of road crossings of wetlands and creeks. The presence of wetland habitat on either side of this existing road as well as the proposed Hanlon Creek Boulevard (Road "A') increases the probability of road mortality and also suggests that wetland–dependent species will be affected the most. Preventative measures such as appropriately sized culverts, signage, lower speed limits, and monitoring are all recommended to reduce the potential for road mortality. Culverts should be sized and located to enhance hydrological connections between wetlands. A mechanism to funnel wildlife to road culverts is recommended. Details should be clearly illustrated on engineered plans.

6. The monitoring plan for restoration areas is not well defined. Additional stations/plots will be required to monitor the success of restoration plantings within buffers, swales, and stormwater management areas. The effectiveness of wildlife crossings (i.e. culverts) should be assessed by monitoring the incidence of wildlife

mortality along Laird Road and Hanlon Creek Boulevard (Road "A'). Terms of reference should be developed for this monitoring component.

7. With respect to monitoring reports, it is recommended that raw data be included in the main body of the report. Vegetation plots should be labeled using standard ELC vegetation type, which is a more descriptive label that will provide a standardized reference point for reviewers. A control site was not identified and is strongly recommended. This will increase the validity of any spatial and temporal trends that are detected and will also help make possible a distinction between human-induced and natural stresses on biological communities and underlying functions. Vegetation, soils, and hydrology data should be integrated as much as possible to facilitate interpretation of monitoring results and to better understand impacts. Statistical analysis and detailed discussion of monitoring results is encouraged. Subsequent monitoring reports should provide results from previous monitoring years for easy comparison among years and stations.

Labelling Issues

DWG A01, Existing Conditions, North of Laird Road – wetland boundaries are not illustrated
DWG A02, Removals – wetland boundaries are not illustrated
DWG A07, Existing Conditions, South-East Quadrant - wetland boundaries are not illustrated
DWG A08, Removals - wetland boundaries are not illustrated
DWG B11-B15, Lot Grading, Pre-grade – wetland boundary and/or grading limits not illustrated; grading setbacks too close to wetland located on Block 47.
DWG B06, Lot Grading, Block 17 – wetland boundary/label not illustrated
DWG B10, Lot Grading, Block 40 - wetland boundary/label not illustrated
DWG B11, Lot Grading, Block 2-5 - wetland boundary/label not illustrated on Block 47
DWG B12, Lot Grading, Block 6-11 – wetland boundary/label and grading limits not illustrated on Block 51
DWG B16-20, Lot Grading, Final – wetland boundary/label not illustrated
DWG D01, Detention Pond 1 - wetland boundary/label not illustrated; cooling trench appears to be located within a provincially significant wetland; should be removed and, if necessary, redesigned.
DWG D02, Detention Pond 2 - wetland boundary/label not illustrated
DWG D03, Detention Pond 3 - wetland boundary/label not illustrated; cooling trench appears to be located within a provincially significant wetland; should be removed and, if necessary, redesigned.
DWG D04, Detention Pond 4 - wetland boundary/label not illustrated
DWG E06, Erosion & Sediment Control, Blocks 17 – sediment fencing within 5 metres of wetland; < 5 m setback from wetland is not acceptable and should be increased during pre-grading;
DWG E08, Pre-Development Erosion & Sediment Control, Blocks 17 – setback from wetland not acceptable, should be increased during pre-grading
DWG E11, Post-Development Erosion & Sediment Control, Blocks 21, 36-38 – wetland label is missing
DWG E14, Erosion & Sediment Control, Blocks 2-5 – setbacks from wetland located on Block 47 not acceptable, should be increased during pre-grading
DWG E15, Erosion & Sediment Control, Blocks 6-11 – limits of GRCA staked wetland located on Blocks 49-51 should be labelled
DWG E16, Erosion & Sediment Control, Blocks 12-14 – setback from wetland not acceptable, should be increased during pre-grading and final grading to avoid existing forest and wetland buffer restoration areas; Block 59 is reserved for restoration, not SWM (per Figure 4 in EIR).
DWG, E17, Erosion & Sediment Control, Blocks 15 – < 5 m setback from wetland is not acceptable, should be increased during final grading; cooling trench for SWM pond on Block 60 should be removed from natural area; consider integrating the small, isolated wetland into SWM block to maintain wetland functions on lot and to increase setback from nearby PSW
DWG E18, Erosion & Sediment Control, Block 24 and Typical Details - < 5 m setback from wetland is not acceptable, should be increased during pre-grading

DWG F01, Typical Cross Sections – 1 metre setback is measured from trunk centre, should be measured from dripline
DWG P05, Road A & Road C – Paige wire fencing should be setback 1 m from trees
DWG P06, Road A & Road C – wetland boundary not labelled
DWG P08, Road A & Road C – wetland boundary not labelled
DWG P12, Downey Road - wetland boundary/label not illustrated
DWG P21, Road J,K & Sanitary Easement - wetland boundary not labelled
DWG P32, Road N - wetland boundary not labelled
DWGP26, Block 9 Easement - wetland boundary not labelled
DWG P27, Pond 1 - wetland boundary not illustrated
DWG P35 – Future Road Ramp – wetland boundary not labelled; headwall structure should be removed from wetland and redesigned as a spreader berm or swale

Aquatic Comments:

4. Page 8 notes more than one servicing crossing, yet the Servicing section of the EIR Section 14.0 on Page 137 states that watermains will not cross any natural features. Please clarify.

5. Page 18 and Page 21; where are the details provided for the rehabilitation and enhancement opportunities that are listed / recommended? For example, the flow obstructions and fish passage concerns at the Laird Road culvert.

6. Page 19; setbacks (Constraint Level 2) should not include development – purpose of setback is to create an area between the natural feature and proposed development that is left intact / or enhanced to protect the natural feature by buffering it from development. Development should not occur in the setback areas.

7. Figure 4 – is there a plan of existing versus proposed conditions for the Downey Tributary?

8. Figure 22 (Trail Network) must be revised to overlay the existing natural features across the site to allow for adequate review of setback distance between trail and feature. (Does figure include ‘off-road’ trails and ‘multi-use’ trails?)

9. Page 45 and 46; what is the timing of the riparian restoration / planting?

10. Figure 11A and Figure 16; what is the setback distance between SWM Pond 3 and the watercourse, Tributary A?

11. Figure 13A; Downey watercourse, are there plans that show a longitudinal profile and cross-sections which include the crossing structures? Where are the SWM swales / conveyance channels in relation to the tributary, above or below and how is the tributary connected to the downstream wetland under proposed conditions?

12. Figure 13B; What is proposed for the upper most reach of the Downey tributary in relation to the proposed servicing and road works?

13. Figure 14; Please show existing conditions to illustrate any alterations between existing versus proposed conditions for the subject tributary. Upper end of tributary on figure appears to be a crossing; is this a road crossing or SWM swale / conveyance channel crossing? Please clarify.

14. Figure 17; what is the setback distance between SWM swale and the closest point of the watercourse?

15. Figure 19; there appears to be a tributary (illustrated as a 'blue' channel) in the upper northwest corner of the figure – what is this feature, i.e. it is not shown as a 'stream' on Figure 12?

16. Page 77 and Page 78; Laird Road restoration - what about the existing culverts and their conditions regarding flow obstructions / debris and fish passage issues? Should culvert be replaced? Discussion includes wildlife passage but ignores fish passage.

17. Page 83 and Page 90; Where are the designated locations for machine maintenance and refueling? Is it shown on the E&SC plans?

18. Page 90; indicates that details of the post-construction monitoring to be discussed with City and GRCA and developer – when is this to occur?

19. Page 91; please be advised that there may not be 2 years of post-construction monitoring of the new culvert crossing at Road A / Tributary A since a HADD determination has not been made yet.

20. Page 99 states that new creek crossing at Road is to occur in 2008 yet Page 7 indicates that there will be no creek work in 2008 and that the new road crossing will be constructed during the summer of 2009. Please clarify.

21. Page 100; what does Block 47 represent? Is it or will it be developed? And will the run-off be treated for water quality?

22. Page 101; Downey Tributary – it was noted that this tributary was only assessed / observed in the field during September and December 2007 and that no site visit was conducted during spring months when this tributary is flowing. Also of note, 2007 was the driest year on record since 1939. For this reason, this tributary is treated as fish habitat, which includes both indirect contributions throughout the year and likely direct fish habitat during spring and significant storm events.

23. Please be advised that in-water works associated with the channel realignment of the Downey Tributary will be in accordance with the MNR coldwater timing restrictions due to the close proximity of coldwater habitat downstream (i.e. 1km sediment transport impact zone).

24. Page 102; the bypass pumping methodology as explained is somewhat confusing, please clarify whether the entire length of proposed realignment will be bypassed at for the duration of works on this tributary.

25. Page 104; to what depth will the sanitary sewer and watermain be installed below the streambed?

26. Section 13.4 (Thermal Impact Analysis) on pages 131 to 136 of the EIR need updating to reflect the Stream Impact Assessment report once finalized / accepted by the GRCA.

27. Page 137 indicates that no watermains will cross natural features however it was our understanding that there was a servicing creek crossing in the general vicinity as the new Road A. Please clarify and update the report as needed.

28. Page 139, it is recommended that no storage of equipment and materials etc. in natural features, however these items should not be stored in the buffers / setbacks to the natural features as well. Please update / revise report to reflect this.

<u>Stream Temperature Impact Report Comments</u>

29. Why was the groundwater temperature monitoring discontinued spring 2008?

30. It was noted that the stormwater pond design storms that were used for the analysis only include the very small frequent storm events (i.e. up to the 1 yr / 25mm storm event). What about larger storm events? Thermal impacts of these storm events should also be considered and discussed in the report to rationalize why larger events were not considered.

31. The 2008 stream water temperature monitoring data should be included / considered in the modeling exercise.

32. Shading the stream and increasing canopy cover, although a good measure of which is supported the GRCA, does not mitigate SWM outlet discharge temperatures. Thermal impacts as a result of stormwater runoff must be mitigated before discharge to the stream.

33. Page 2; please provide the rational / document in the report for reason for not including proposed SWM Pond No. 2 in the modeling exercise.

34. It was noted that water temperature monitoring in 2007 was from August to December 2007, however, Figure 2.2 to 2.4 only reports until November 2007. Please clarify.

35. Page 8; please be advised that GRCA found brook trout downstream of Downey Road within the main branch of Hanlon Creek during summer 2005 / 06.

36. Page 20; it was stated that water temperatures can remain below 1 deg C in the winter – this is not understood. What does this mean? Please elaborate.

37. Page 20; 7.4 deg C would appear to be high based on the fact that survival sharply declines from 7.4 to 8 deg C. Please clarify.

38. Page 21; it was noted that for juvenile brook trout, a water temperature of 18 deg C or above would be detrimental except for periods of short duration. One would expect that the optimum temperature range would then be between 10 and 18 deg C and <u>not</u> between 10 and 19 deg C.

39. Please confirm whether or not there is an assumption for SWM pond temperature in the current model whereby 25deg C is input into the model. Worst case scenario, it is our understanding that SWM pond temperature could easily reach 30 deg C. This should be used within the model.

40. Literature indicates that 24 deg C is considered lethal – having this as the upper limit for SWM discharge temperature does not "avoid lethal temperatures". The upper limit / maximum for SWM discharge to avoid lethal effects on brook trout should be below the literature cited lethal temperature.

41. Page 30 indicates that there will be more runoff entering the Hanlon Creek as a result of the development, how will this affect the creek in terms of more runoff at a higher temperature than under current conditions. Also, how will it affect the creek in relation to stream erosion?

42. Page 31, it is our understanding from literature that it is either not agreed upon or unclear as to how upper lethal water temperatures at the individual level has at the population level. This should be revised (to clarify) in the summary for this section.

43. Table 4.1: 'description' refers to 8 modeled years however, earlier in the report it suggests that the first year (of 8) was discarded. Please clarify if the table should refer to 7 modelled years. Also, the table only refers to

averages, the statistics should also identify the range from which the average comes from so to understand the variability in each statistic (especially for the maximum parameters).

44. Table 4.2: again the table only refers to averages, the statistics should also identify the range from which the average comes from so to understand the variability in each statistic. Also, please clarify whether this table refers to existing conditions or during / post development conditions. And if not existing conditions, how do these post development conditions compare to existing conditions, based on reaches? Also, it is noted that all reaches will exceed 19 deg C and that reaches 9, 10, and 12 exceed temperatures > 24 deg C, please clarify what the SWM discharge temperature target is and what the instream temperature target is. From these statistics, it would appear as though targets will not be met.

45. Page 34: it is concluded that the mean and maximum temperature guidelines for the month preceding spawning are met in all reaches but reach 12, however Table 4.3 indicates that all reaches (except reach 7) exceeds 19 deg C, in reference to frequency exceedence, so it would appear as though the guidelines are not being met - what is the conclusion based upon?

46. Table 4.4: It would appear as though 10.8 for reach 3 under avg. hrs. over 11 deg C per event may be a typo.

47. Table 4.4 and Table 4.5: the statistics presented in Table 4.4 (future conditions) have higher exceedance results than Table 4.5 which represents existing conditions. This would imply a thermal impact when compared to existing conditions.

48. The following additional general comments pertain to the Stream Temperature Impact report:

    - Was during construction development phase considered / factored into the modeling exercise, and if so, how what are the impacts / results? Please included in analysis / and assessment of impact.
    - The temperature monitoring used to assess impact was based on incomplete monitoring years of 2006 and 2007 i.e. only sampled for portions of summer and fall, no winter or spring sampling was completed. The continuous monitoring being completed in 2008 should be used to compare existing / current condition stream temperatures to the modeling predictions for developed and mitigated conditions results in order to quantify changes and thermal impacts. This will further identify mitigation requirements and confirm that impacts to Hanlon Creek (Tributary A and A1) can be fully mitigated under during and post development conditions. Monitoring for a full year / a full four season review as agreed upon in our August agency meeting.
    - Shading of the SWM ponds and stream will not have any effect for a number of years until it has time to establish and grow. How was taken into account in the modeling exercise? The developed / mitigated condition results also need to consider during construction / development conditions and not just post development conditions.
    - Night time release and pond configuration (high length to width ratios) were mitigation measures recommended in the EIR and the EIR indicated that it would be considered as part of the thermal model, how was it considered?
    - The current temperature monitoring for 2008 and winter / spring 2009 should also be used (in addition to the 06 / 07 data) in the modeling exercise to include a wet (and perhaps cooler) year to better represent existing temperature conditions of Hanlon Creek.

49. Page 40 and also Page 147 of the EIR: further mitigation measures / contingencies must be identified now as part of the monitoring program so that the adaptive management approach is well understood. In general, much more detail in the monitoring program is required. For example:

- Where will temperature be monitored to in relation to the mitigation measures implemented, groundwater, and at stream level?
- How will temperature be monitored? What instruments will be used to monitor? Will flow and dissolved oxygen also be monitored?
- Confirm location of biological monitoring, i.e. fish community (quantitative and qualitative?), benthic invertebrates etc.
- When will the pre-development monitoring program end and during development monitoring begin for each parameter? For example, when will the groundwater and stream water temperature monitoring begin considering at least 1 year pre-development monitoring should be completed to establish a seasonal thermal regime and how it changes throughout the year?
- Who will carry out which aspects of the monitoring program and for what duration / time period?
- What will be the frequency of reporting? Who will receive the reports and review / comment / approve them?
- What will the trigger mechanisms be for not meeting established targets? What process will be followed to carry out inspections etc.? What will the contingency measures be for rectifying / implementing additional temperature mitigation measures? What will the timeframe be for implementing such additional measures?

Plans / Drawings

50. Drawing No. 22490-01-C02 depicting the crossing of the realigned ‘natural ‘ channel Downey Tributary should be revised to show the central culvert countersunk / embed a minimum of 15% into the streambed. Additional mitigation measures / plans i.e. erosion and sediment control plans, site restoration plans etc. will be required at the GRCA permitting stage for this work. Please be advised that a fishery timing window of no in-water work shall take place on or between October 1 and June 30th and any year for the protection of the local fishery of Hanlon Creek immediately downstream of this site.

51. Drawing No. 22490-01-C04, additional mitigation measures / plans i.e. erosion and sediment control plans will be required at the GRCA permitting stage for this work.

52. Drawing No. 22490-01-C07 depicting the another crossing of a ‘natural ‘ channel section Downey Tributary should be revised to show the central culvert countersunk / embed a minimum of 15% into the streambed. Additional mitigation measures / plans i.e. erosion and sediment control plans, site restoration plans, etc. will be required at the GRCA permitting stage for this work. Please be advised that a fishery timing window of no in-water work shall take place on or between October 1 and June 30th and any year for the protection of the local fishery of Hanlon Creek immediately downstream of this site.

53. All plans including all the Pre-grading and Erosion and Sediment Control Plans must show / delineate all watercourse features. Please revise plans accordingly.

54. It is not clear from the current set of plans how the very upper end of the main branch of Tributary A (near Forestell Road) will be affected by the proposed development in that area. Please identify on all plans for this area of creek.

We look forward to a response to these points.

Yours truly

Fred Natolochny
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Resources Planning

cc. City of Guelph, Economic Development
Natural Resource Solutions Inc.
Astrid Clos, Planning Consultant
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Memorandum

Date:	December 16, 2008
To:	John Palmer
From:	Nicole Weber, Ph.D., P.Eng.
Project Number:	54-22490
Subject:	Hanlon Creek Business Park, Response to GRCA Stream Temperature Impact Report Review

Distribution: Peter Cartwright, Rick Clement, Ray Tufgar, Dave Stephenson, Andrew Schiedel

Introduction:

This memorandum is a response to the Technical Review of the HCBP Stream Temperature Impact Report authored by GRCA, dated November 27, 2008. The GRCA provided engineering comments on the continuous hydrologic and water temperature model, developed by AECOM (TSH) using the HSP-F software. The goal of the continuous modelling is to determine if the proposed mitigation measures would be effective in protecting the Hanlon Creek tributary from thermal impacts due to the development of impervious areas in its watershed. This response to the GRCA Technical Review will strengthen the original assumptions made during the modelling process, thus confirming the conclusions from the Stream Temperature Impact Report that the proposed mitigation measures will be effective in protecting the creek from thermal impacts due to increased development.

Response to GRCA Comments:

1. **Examination of the impact of assuming an effective 45% imperviousness when modelling developed lands versus modelling the infiltration galleries explicitly.**

As part of the hydrogeological study, required water recharge rates were determined for each proposed lot, based on factors such as underlying soil and groundwater table levels. Infiltration galleries will be sized to capture runoff from rooftops and infiltrate it in an effort to meet this required recharge rate. This was simulated in the stream temperature model by designating the rooftop areas (approximately 40% of total lot area) as pervious land, allowing infiltration to occur. At the outset, it was deemed impractical to model each individual infiltration gallery on industrial block as these infiltration galleries have not been designed. The individual designs will depend on site specific

conditions on each block in order to meet the recharge targets set. However, we do see the importance of evaluating the assumptions made on the water balance in the system.

To gauge the effect that the 40% pervious rooftop assumption has on the overall water balance for an industrial site, three sample modelling schemes were examined. A one hectare representative industrial lot was modelled in each of the schemes under varying conditions, as described below:

i. Scheme 1 – Scenario as modelled for the Stream Temperature Impact Report. Lot area consists of 55% pervious area (40% from rooftop, 15% from open area), with 45% impervious area (parking lot, road, etc.).
ii. Scheme 2 – Lot area consists of 85% impervious area (rooftop, parking lot, etc) and 15% pervious area (open areas). 40% of impervious area is routed to an infiltration gallery sized to contain 25mm of precipitation from the roof.
iii. Scheme 3 – Lot area consists of 85% impervious area and 15% pervious area, as in Scheme 2. There is no infiltration gallery. This is the unmitigated scenario.

Table 1, Table 2 and Table 3 present the water balance results of the three modelling scenarios.

Table 1 - Surface runoff comparison between modelling schemes

Surface Runoff (% of total precipitation)				
	Sand	**Silt**	**Clay**	**Organics**
Scheme 1	35.8%	35.8%	42.2%	35.8%
Scheme 2	36.0%	36.6%	48.0%	35.9%
Scheme 3	67.6%	67.6%	69.3%	67.6%

Table 2 - Infiltration/interflow comparison between modelling schemes

Infiltration/Interflow (% of total precipitation)				
	Sand	**Silt**	**Clay**	**Organics**
Scheme 1	21.8%	21.0%	12.3%	22.0%
Scheme 2	37.4%	36.7%	24.7%	37.6%
Scheme 3	5.9%	5.7%	3.4%	6.0%

Table 3 - Evapotranspiration comparison between modelling schemes

Evapotranspiration (% of total precipitation)				
	Sand	**Silt**	**Clay**	**Organics**
Scheme 1	42.5%	43.1%	45.4%	42.2%
Scheme 2	26.5%	26.7%	27.3%	26.5%
Scheme 3	26.5%	26.7%	27.3%	26.4%

The surface runoff between Schemes 1 and 2 are almost identical, indicating that the current model accurately portrays watershed runoff response. Scheme 2, with the infiltration galleries, has more infiltration than either of the other Schemes. Scheme 1 has the highest evapotranspiration values, given its high proportion of pervious areas which are accompanied by relatively large amounts of depression storage and vegetation.

The current model underestimates infiltration but matches surface runoff when compared to the Scheme that explicitly models infiltration galleries. Increased infiltration will infuse more groundwater

baseflow into the creek, providing cooler overall temperatures. Thus, the current model provides a conservative simulation of stream temperature without artificially mitigating any thermal impacts from stormwater runoff.

2. Sensitivity analysis on the proposed conditions level of imperviousness.

In order to gauge the effect of rooftop infiltration galleries becoming ineffective, a sensitivity analysis was performed on the imperviousness of the watershed, since impervious percentage was used in HSP-F to simulate the infiltration galleries. The impervious percentage for the industrial lots was designated as 85% during the preliminary design, and that value is used to simulate a complete failure of all infiltration galleries. The impervious percentage when all infiltration galleries are functional is set at 45%, given the estimated rooftop area of 40% of each industrial lot. These two scenarios comprise the extremes of infiltration gallery performance, and the average stream temperature statistics are presented in Table 4.

Table 4 - Imperviousness sensitivity analysis stream temperature results, average temperatures (°C) over 7 years continuous modelling

Reach	Summer Maximum Temperature		Summer Average Temperature		Summer Average Daily Maximum Temperature	
	45% Impervious	85% Impervious	45% Impervious	85% Impervious	45% Impervious	85% Impervious
2	20.2	20.5	12.6	13.7	15.2	16.1
3	21.2	21.3	14.6	15.0	17.3	17.5
5	21.0	21.1	14.7	14.7	16.9	16.9
7	18.1	18.3	13.1	13.2	14.6	14.7
8	21.8	22.2	13.8	14.7	16.2	17.3
9	21.8	22.2	13.6	14.0	16.6	17.1
10	22.5	24.0	13.7	14.4	17.1	18.1
12	25.9	26.0	13.7	14.2	19.3	19.9

The effects of infiltration gallery failure are, for the most part, limited to less than a degree increase in either maximum or average temperatures. The reaches that are most affected are Reach 10 and 12, which are downstream of the key area of interest noted in OMB condition 12. Other than Reach 10 and 12, all average summer maximum temperatures are within the 24°C limit for the maximum temperature and under 18°C for summer average daily maximum temperatures. While the infiltration galleries do provide valuable mitigation, both in water temperature and runoff quantity, the effects of their simultaneous failure is limited in relation to maintaining an ideal stream temperature.

In addition, and as noted in Point 1 above, the 45% impervious value underestimates the volume of water infiltrated to groundwater and overestimates evapotranspiration. This indicates that functional infiltration galleries would have an increased benefit to the stream not realised in this simulation due to increased groundwater discharge cooling stream temperatures.

3. Sensitivity analysis on various parameters that are changed under proposed conditions.

This item is incorporated into items 4. and 5. wherein the results of the sensitivity analysis on the CFSAEX and KMUD parameters, respectively, are presented and discussed.

4. Analysis of the feasibility of proposed shading mitigation, as represented by a sensitivity analysis of the CFSAEX parameter.

In an effort to better understand the performance of the proposed mitigation measures on a temporal basis, a sensitivity analysis was performed on the implementation of increased riparian shading, as represented by the CFSAEX parameter. The CFSAEX parameter in HSP-F represents the proportion of solar radiation measured at the meteorological station that actually reaches the water in the stream.

The Proposed Mitigated conditions were simulated with varying values of CFSAEX to simulate the riparian cover around the stream. The values used were fully unmitigated (i.e. existing), fully mitigated (100% of proposed riparian cover increase), and 50%, 75% and 90% of the proposed riparian cover increase. For example, if an unmitigated CFSAEX value of 10 was used, and a fully mitigated value of 20 was used, the 50%, 75% and 90% values would be 15, 17.5, and 19, respectively. Table 5, Table 6, and Table 7 summarize the results of the sensitivity analysis. The temperatures presented in the tables are averaged over the seven years of continuous modelling.

Table 5 - Summer maximum temperatures (°C) by reach as a function of proportion of total proposed riparian cover

Reach	Summer Maximum Temperature				
	0%	50%	75%	90%	100%
2	23.1	21.5	20.8	20.4	20.2
3	23.4	22.2	21.7	21.4	21.2
5	22.9	21.8	21.4	21.1	21.0
7	18.6	18.2	18.1	18.1	18.1
8	22.1	22.0	21.9	21.9	21.8
9	27.0	24.0	22.9	22.2	21.8
10	22.9	22.7	22.6	22.6	22.5
12	26.2	25.9	25.9	25.9	25.9

Table 6 - Summer average temperatures (°C) by reach as a function of proportion of total proposed riparian cover

Reach	Summer Average Temperature				
	0%	50%	75%	90%	100%
2	13.9	13.3	12.9	12.7	12.6
3	15.5	15.0	14.8	14.7	14.6
5	15.6	15.2	14.9	14.8	14.7
7	13.2	13.2	13.1	13.1	13.1
8	13.9	13.8	13.8	13.8	13.8
9	15.3	14.4	14.0	13.7	13.6
10	14.0	13.8	13.8	13.7	13.7
12	13.8	13.7	13.7	13.7	13.7

Table 7 - Summer average daily maximum temperatures (°C) by reach as a function of proportion of total proposed riparian cover

Reach	Summer Average Daily Maximum Temperature				
	0%	50%	75%	90%	100%
2	18.7	16.8	16.0	15.2	15.2
3	19.6	18.4	17.8	17.3	17.3
5	19.5	18.2	17.5	16.9	16.9
7	15.0	14.8	14.7	14.6	14.6
8	16.5	16.3	16.3	16.2	16.2
9	21.5	19.0	17.7	16.6	16.6
10	17.8	17.4	17.3	17.1	17.1
12	19.6	19.4	19.4	19.3	19.3

It is reasonable to assume that at least 50% of the proposed riparian cover can be obtained relatively quickly, through planting trees that are as large as is feasible (40mm calliper wire basket or 1.5m balled and burlapped) planting fast-growing species (cottonwood and trembling aspen etc.) of trees as a portion of the total cover, and by incorporating grasses and shrubs (pussy willow etc.) close to the stream. It can be observed that slightly more than half of the temperature decrease due to riparian cover is obtained when 50% of the proposed cover is in place. It is also notable that all reaches that receive mitigation (i.e. all reaches except Reach 10 and 12) are within the 24°C maximum summer temperature limit after 50% of the proposed cover is in place and under 18 °C for the summer average daily maximum temperature.

5. Sensitivity analysis of the KMUD parameter within the proposed SWM ponds, and a discussion on the suitability of representing the pond mitigation measures using the KMUD parameter.

Given the uncertainty in the performance of the proposed bottom-draw SWM ponds with cooling trenches, a sensitivity analysis was performed on the KMUD parameter within the ponds. In the absence of more explicit means of modelling the pond BMP, the KMUD parameter was chosen to best represent the physical process of bottom-draw and cooling trenches. KMUD is a heat transfer coefficient between the water in the water volume of interest (in this case the SWM ponds) and the ground, which has temperatures indicated in the groundwater temperature modelling. As KMUD becomes higher, the relative magnitude of heat energy transferred between the water and ground increases, meaning if the ground is cooler than the water, the water is cooled to a greater extent by the ground with a higher KMUD value. The KMUD values used in the simulation are 10 for an unmitigated pond, and 20 for a pond with bottom-draw and a cooling trench. As part of the sensitivity analysis, simulations with a KMUD of 15 and 25 were performed to offer a wider range of results to compare.

The Max-Becker pond in Kitchener is similar in design to the proposed SWM ponds for the HCBP. It features a bottom-draw outlet structure that flows into a cooling trench before being released to the receiving watercourse. Recent monitoring results summarize the water temperature time series of several locations within the pond: the inlet sediment forebay, the bottom-draw outlet, and the outlet of the cooling trench. In order to compare modelled temperatures to monitored data, we compare the temperatures from the Max-Becker pond monitoring to a storm event experienced during a hot day in

2006. Figure 1 displays a time series of the KMUD sensitivity analysis for proposed SWM Pond 4, as well as the maximum forebay and cooling trench outlet temperatures for the 02/Aug/2006 precipitation event. The preceding day, 01/Aug/2006, was the hottest day of the 2006 July/August summer season. Thus, this precipitation event was thought to provide a worst-case scenario of warm runoff entering the ponds and potentially the stream.

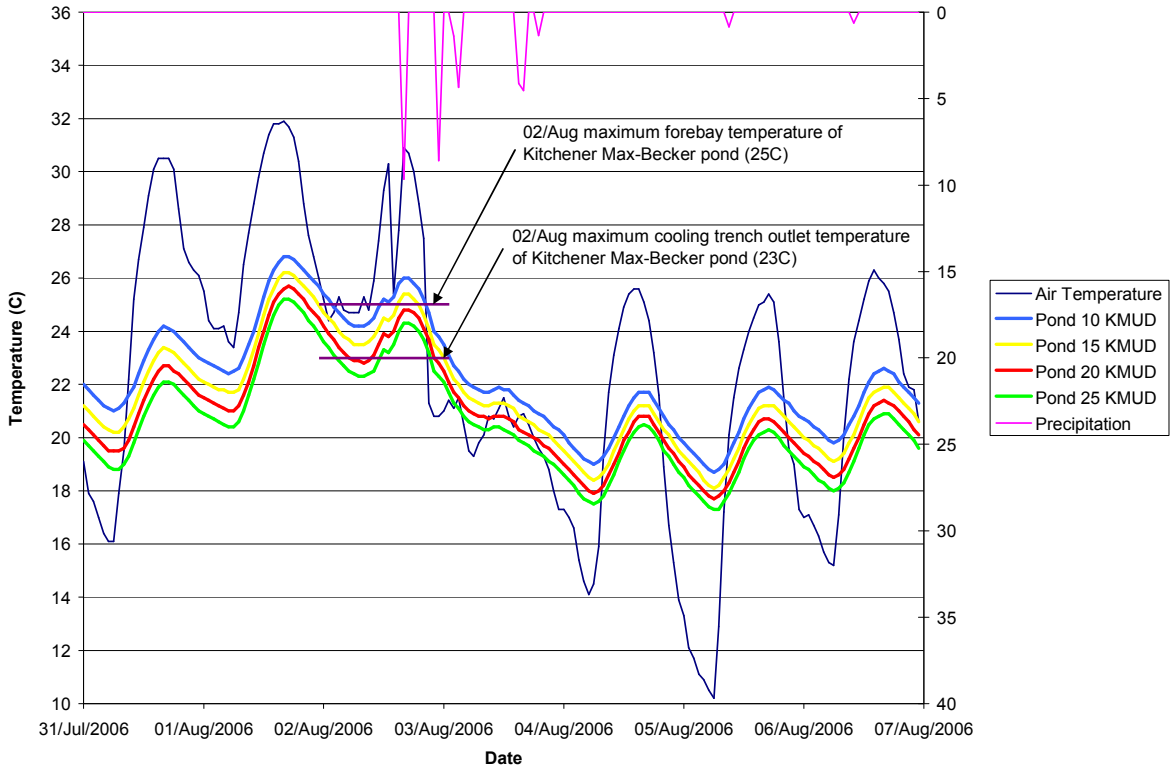


Figure 1 - KMUD sensitivity analysis time series for Pond 4 compared to the Max-Becker pond maximum temperatures (°C) for the 02/Aug/2006 precipitation event

As is demonstrated in the above graph, the simulated pond temperatures are within a degree of the observed temperatures at the Max-Becker pond, and have overestimated the maximum temperatures of that warm precipitation event. Therefore, the results presented in the Stream Temperature Impact Report offer a conservative, and accurate, representation of pond performance using the KMUD parameter.

6. Evaluation of the potential for the small, cold-water Hanlon Creek Tributary to be overwhelmed by warm discharge from the proposed SWM ponds.

The concern brought forth by the GRCA is that the discharge from the SWM ponds will be so great during storm events that it will overwhelm the regular creek flow and cause a significantly warming effect. In the previous section the Max-Becker pond in Kitchener was referenced, and during the August 02, 2006 precipitation event, which followed the hottest day of the 2006 summer season, the maximum cooling trench outlet temperature was approximately 23°C. It was demonstrated that the

SWM Ponds as modelled in the “mitigated conditions” HSP-F model accurately represent the bottom-draw/cooling trench pond performance, as monitored at the Max-Becker pond. Figure 2 below displays the creek water temperatures upstream and downstream of Pond 4 for the August 2, 2006 precipitation event.

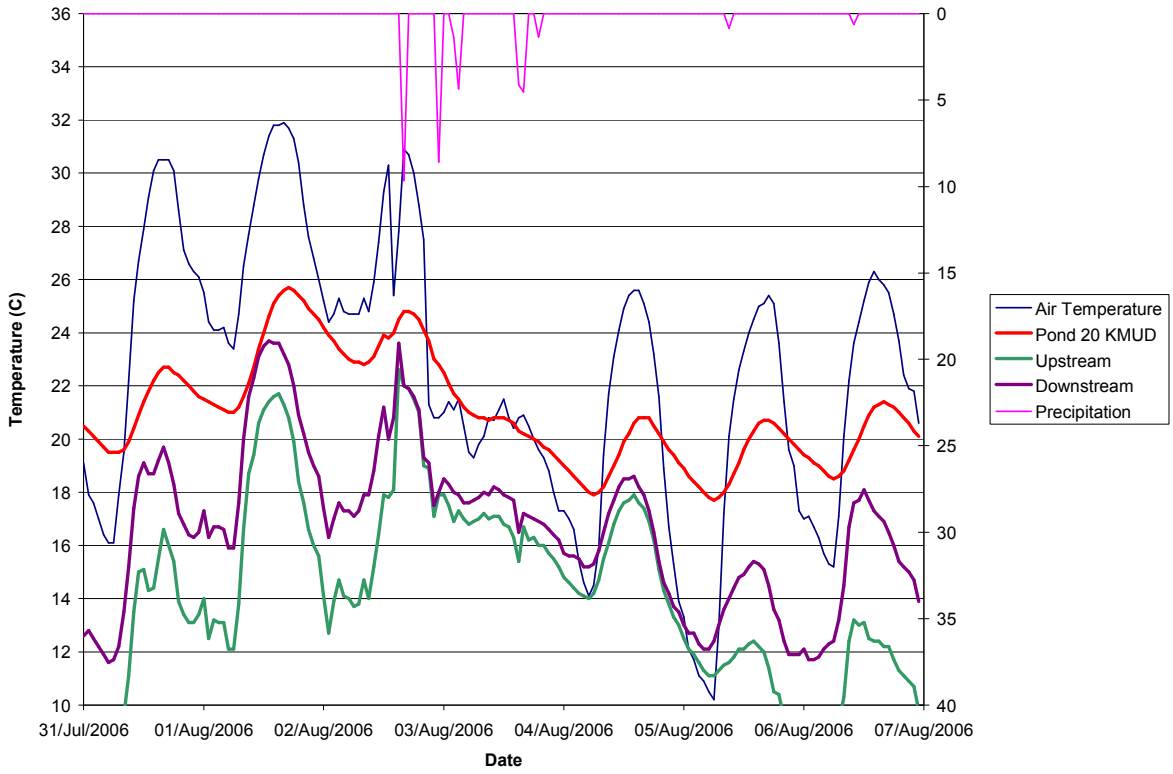


Figure 2 - Stream temperature upstream and downstream of Pond 4 for the 02/Aug/2006 precipitation event

It becomes clear that the pond discharge does have an effect on the water temperature in the stream; however, the precipitation brings about a significant cooling effect after being routed through the mitigated SWM pond. A summer precipitation event is almost always accompanied by heavy cloud cover and a significant drop in air temperature, which contribute to cooler stream temperatures. HSP-F determines the temperature of precipitation using the ambient air temperature, which is a conservatively warm estimate compared to reality (where precipitation temperature is based on the wet-bulb temperature). Therefore, during the warm summer months, precipitation is usually comparatively cool, and though large volumes of it are entering the stream due to the impervious watershed, the runoff does not appear to significantly influence the temperature regime of the stream.

An additional temperature concern with urban runoff is the warming effect from the hot asphalt and roof surfaces. While this is not explicitly modelled in HSP-F, such effects would be short-lived and heavily mitigated by the bottom-draw feature of the proposed SWM ponds. Any heat energy in the impervious surfaces would be transferred to runoff in the beginning stages of a large storm. This “first-flush” of runoff would be detained in the SWM ponds instead of being directly discharged to the stream, and cooler water from bottom of the pond would be released. Over the duration of the storm,

the initial warmer water would be mixed with the cooler water in the bottom of the pond and with the cooler runoff that would follow the “first-flush” during the precipitation event. Also not included in our model are treed conveyance channels and underground concrete storm sewers that would reduce runoff temperatures entering the ponds.

In conclusion, while it may be that the SWM ponds discharge a large volume of runoff during precipitation events, the modelling (and Max-Becker pond monitoring) show only minor adverse warming effect in the stream. In fact, depending on antecedent air temperatures, water temperatures and solar radiation conditions, the opposite appears to be true given the relative coolness of summer rain and the performance of the mitigated SWM ponds.

7. Investigation of additional mitigation measures to reduce reliance on the temperature model and add resiliency to the proposed mitigation measures.

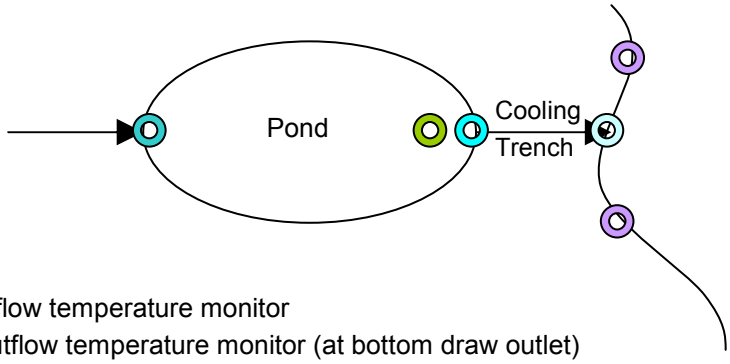
The consultant team agrees that low impact development (LID)can be used in theory and in practice to limit the need for end-of-pipe solutions for stormwater management. This is the reason that the hydrogeologic study of the area set infiltration targets for all development blocks within the HCBP. These targets are meant to ensure that the water balance within the HCBP is maintained and that ground water levels (and the associated stream discharge levels and temperatures) are maintained. The way in which these targets are met is left up to the individual lot developers to ensure that site specific conditions are taken into consideration and used to their full advantage during preliminary and final design.

Portions of the HCBP lie within the wellhead protection areas of the Downey well. Therefore, due to the sensitive nature of the groundwater in the area, we caution against infiltrating water from parking lots and roads in an industrial/business park without initial treatment for water quality.

As a final note, Figure 7, 8 and 9 in the EIR shows the draft site planting plan that clearly indicates that stormwater conveyance swales will be shaded by trees and shrubs.

8. Further commentary on the proposed adaptive management approach.

1) We agree that the stormwater management scheme and associated temperature mitigation measures will be revisited between development phases to ensure that state of the practice techniques are incorporated.
2) -4) The proposed stormwater pond monitoring plan is described herein:



- Pond inflow temperature monitor
- Pond outflow temperature monitor (at bottom draw outlet)
- Pond cooling trench outlet temperature monitor
- Pond stratification temperature monitor cluster (3 monitors on a weighted line at varying depths)
- Stream temperature monitors upstream and downstream of pond outfall

This incorporates a total of eight continuous temperature monitors to identify the temperature changes through the pond system and the impact on the receiving stream reach. Further, the existing seven temperature monitoring stations for used for the predevelopment monitoring should be maintained. The frequency of sampling will depend on time of year with a higher frequency in summer and lower frequency in winter with a frequency not to exceed one measurement every 30 minutes (every 15 minutes in summer).

5) The consultant team is in discussions with the University of Guelph, the City of Guelph Engineering Department, the City of Kitchener Engineering Department and the GRCA with respect to initiating a monitoring program of existing stormwater ponds to identify best practices in pond design for temperature impact mitigation. This program will also include the above noted monitoring when the HCBP ponds have been constructed.

9. Delivery of annotated HSPF input and summary output files for each development scenario.

A continuous hydrologic simulation requires a large amount of meteorological data to function. As well, HSP-F produces lengthy output files that are summarized into a ".wdm" file, which serves as a database for all input and output time series. The output contents of the ".wdm" reflect the results of the model that was most recently run, and changes each time a new model scenario is executed.

A CD containing the ".wdm" file, in addition to the model input files, has been included with this submission. The ".wdm" should be placed in the directory "C:\Hanlon", since the model input files

require a folder reference to locate the ".wdm" file. The HSP-F software can be downloaded from the US EPA website, found here: http://www.epa.gov/waterscience/ftp/basins/system/BASINS3/ Note that version 3.1 of BASINS was used for the Hanlon simulations (BASINS contains the HSP-F model). A copy of the BASINS 3.1 installation file was also included on the CD.

The models are executed using the "WinHSPFLt" program from the BASINS installation, and the WDM file is viewed using the "WDMUtil" program.

10. Development of catchment maps to reflect the model schematics provided in the Stream Temperature Impact Report.

These figures have been developed and are included as full page 11"x17" prints in the latest version of the Stream Temperature Impact Report as Figures 3.1 and 3.2. The modelling schematic figures have been relabelled Figures 3.3 and 3.4.

11. Explanation of imperviousness values applied to the proposed conditions catchments.

The imperviousness values were developed through a land-use analysis of the proposed conditions. Within the drainage area of each SWM pond and stream reach there are a variety of land uses, including industrial, roads, residential, wetlands and open spaces. The aggregate impervious value presented on the modelling schematic in the Stream Temperature Impact Report incorporates the imperviousness from each of these land uses, weighted by the relative proportion of each land use draining to each pond or reach. Each industrial lot was assumed to be 45% impervious.

12. Explanation of infiltration rates used for organic soils.

The infiltration values used in the hydrologic simulation reflect high moisture retention of organic soils. While these values may not be sustainable over a period of many hours or even days, it is reasonable to assume they can be sustained over the duration of a storm event. In total, only 1.9% of the drainage area within the site is classified as organic soils (6.6ha out of 352ha). This reduces the sensitivity of the model to the infiltration rate of organic soils significantly.

13. Discrepancy in Figure C-11 in Appendix C of the Stream Temperature Impact Report.

The discrepancy in figures has been corrected. The appropriate graph is now included in Appendix C.

NSW:dca
Encl.

February 10, 2009

Allan Hearne
Planning Department, City Hall
59 Carden Street, Guelph, Ontario
N1H 3A1

Dear Mr. Hearne,

Re: **Hanlon Creek Business Park – City of Guelph Subdivision File 23T-03501**

The Grand River Conservation Authority had previously provided comments on reports relating to the above noted subdivision file on December 15, 2008. We have since then had a technical review meeting with consultants responsible for the technical reports produced to satisfy draft plan conditions for this application.

Following our technical meeting and in response to our comments of December 15, 2008, we have received a memo from Natural Resource Solutions Inc. dated January 27, 2009 that has addressed the points raised by our biologists relating to the physical terrestrial and aquatic habitats. We have reviewed the points provided and can advise we accept the points provided in the memo, but have not at this point had an opportunity for detailed review of the drawings and changes agreed to. We understand that the EIR will be revised further and re-submitted, and trust that pertinent details will be clearly illustrated, labelled, and outlined on accompanying site and grading plans.

In addition, we have received a response from AECOM to our December 15, 2009 letter along with a stream temperature impact report with a continuous model used for analysis, a storm water management report and a series of accompanying drawings. We are in agreement with the points of response provided in the cover letter. As we received the package on February 2, 2009, we have not reviewed the drawings in detain, but will be providing additional comments once we have had an opportunity to review the submission in more detail.

To facilitate our detailed review we are requesting that the consultants please provide a copy of the current Draft Plan. Numerous block numbers have changed with the result that some of the drawings cannot be related to points of response in AECOM's January 29, 2009 Letter (e.g. The former Blocks 42 and 43 around a small wetland are now Blocks 13 and 14 in the latest drawings, former Block 17 is now Block 1, etc). In order to review all of the points of the January 29, 2009 letter we will need a full set of drawings. Some of the current grading and E&S plans were not included in the latest submission. The revised hydraulic modelling is acceptable and changes to the floodplain upstream of the new crossing are confined to the protected core wetland. We would appreciate receiving an electronic copy of January 2009 hydraulic model (HEC2) for our records

The consulting team have provided responses to the points raised in our prior comments. We are satisfied with the responses to these points, and will be reviewing the drawings and technical reports in greater detail.

Yours truly

Fred Natolochny
Supervisor of Resources Planning
Resources Planning

cc AECON
Natural Resource Solutions Inc.
Astrid Clos, Planning Consultant
City of Guelph, Engineering Department
City of Guelph, Economic Development

March 26, 2009

Allan Hearne
Planning Department, City Hall
59 Carden Street, Guelph, Ontario
N1H 3A1

Dear Mr. Hearne,

Re: **Hanlon Creek Business Park – City of Guelph Subdivision File 23T-03501**

The Grand River Conservation Authority has now had an opportunity to review the following documents relating to the proposed plan of subdivision, Phase 1 and 2:

- January 2009 Storm Water Management report (AECOM)
- February 9, 2009 Environmental Implementation Report (NRSI)
- December, 16, 2008 Memorandum – AECOM (Nicole Weber) response to Stream Temp. Impact Report review.
- January 27, 2009 Stream Temp Impact Report (AECOM-EbnFlow(Bob Walker)) – same as prior report but includes findings of the Dec. 16 memo.

Based on our review we have the following comments that require a response before we can provide support for the proposal:

1. Forebay dispersion length and average velocity calculations have not accounted for decreased depth as sediment accumulates. Also, cleanout period calculations have assumed that the entire permanent pool volume is available for sediment storage although not necessarily used. Typically we see calculations based on the forebay depth remaining at cleanout time with such depth resulting in no more than 5% decrease in the design TSS removal efficiency. Rather than calculating a 10-year sediment accumulation volume for each forebay, we recommend estimating the time at which cleanout is required.

2. Although we are confident that cooling trenches in the proposed locations will be exposed to high groundwater elevations, we remain concerned with the lack of hydraulic head needed to force flow through the trenches. Instead, discharge from the stormwater ponds will be prone to preferential flow along upper trench surfaces, thus bypassing the benefits of mixing with and displacing cooler ground water.

3. Designs that we have approved in the past have an upper perforated pipe, plugged at the downstream end, that distributes inflow along the length of the trench, and a lower perforated pipe that collects water passing down from top to bottom. The bottom collector is plugged at the upstream end, brought up in a vertical riser at the downstream end, and then discharged at an elevation that permits flow through the trench. A system such as this does ensure flow through the trench and mixing with

any ground water in the trench. As well this approach would also permit the use of deeper buried trenches that are less prone surface warming.

4. Monitoring on page 74 of the EIR refers to "post construction monitoring and details of monitoring to be refined" – this detail is required as part of this review, including the related triggers and proposed contingencies/possible mitigation. On page75 the suggestion is to only require post construction monitoring until 75% build out in Phase I and II, then 'state of the watershed type takes over'. We are not satisfied this is sufficient and recommend that a minimum time be established following substantial build out. A minimum of 2 years following 75% should be considered. We note that other specific developments are considering 5 years after 90% build out. In addition, we suggest an overall review of the monitoring to be undertaken prior to initiation of Phase 3 as part of the adaptive management plan. On page 142 dealing with triggers 'Response 2' suggests 24 C or above – requires more detail and thought.

The following comments are general in nature or should be considered to provide clarity to the proposed works, or are details that do not impact the overall design, or should be considered for temporary works required as part of the development process that we anticipate will be addressed through our permit process:

Storm Water Management details are in conformance with the Storm Water Master Plan.

The major/minor storm water system is acceptable.

GW concerns were dealt with adequately in prior submission of the hydrogeology.

A revised flood plain model has been submitted that provided some clarification of revised geometry and flows. Proposed grading is generally well setback from the existing floodplain. The new crossing at the future Hanlon Creek Boulevard is sufficiently large not to warrant floodplain mapping revisions. There is slight increased in upstream depth but they are contained within the open space area. As the future regulatory flood elevation will be about 0.7m below the top of the culvert headwall and as the increased breadth of the floodplain in this area appears to be as much due to improved contour mapping as it is to increased flows, we are not concerned with what now appears to be a floodplain encroachment.

Our copy of the 1992 floodplain model also has a flow change at Section 206 with a regulatory flow of 10.3cms (other regulatory flows are identical to those that you have used in the existing conditions model). Please qualify the approximately 30 to 60 percent increase in proposed regulatory flows when compared to those in the 1992 floodplain mapping study.

We note that insertion of geometry for the future Road A crossing into the floodplain model results in an approximately 100m increase in the distance between the original cross sections bounding this crossing. Please adjust as the model's channel and overbank distances then revise floodplain elevations as needed. Based on modelling output, the increased regulatory flow for future conditions, and the proposed Road A crossing, will increase upstream flooding by 0.58m (from 321.16m to 321.74m). According to Lot Grading Plan B1 this would result in a spill over the 321.70m high trail, located near the west bank, into Pond 1's conveyance swale. To correct this you may wish to revise grading of this trail.

Please provide an electronic copy of cross-section locations for the flood plain model, in plan view, that can be georeferenced to UTM coordinates and imported into GIS.

Prior comments on the proposed sediment and erosion controls have mostly been addressed with the exception of straw bales being in the legend instead of Ditch Chexx in the SE quadrant drawing set. Drawings E6 and E13 still have straw bales in the legend instead of Ditch Chexx. We suggest that a Ditch Chexx detail be included in Drawings E13 and E18.

We agree with the comment that 25mm infiltration targets for each block have been set for on-site infiltration to match the predevelopment condition and that opportunities for enhancement may be addressed at the site plan.

You may wish to revise the paragraph of Section 2.1.4.1 that states that infiltration on-site or through ditches has been assumed in the MIDUSS modelling. The appended modelling and the summary pond output table are identical to those in the prior SWM report in which infiltration is not accounted for. With respect to pond design volumes this is considered to be a conservative approach. As we understand it, it is the HSP-F stream temperature simulation model that accounts for on-site infiltration, not the MIDUSS hydrologic model.

The turbidity curtains now proposed in each of the SWM facilities appear to be permanent rather than temporary features designed to improve settling of sediment until the development is built out and stabilized. Pond-3 does not have a turbidity curtains. You may wish to consider adding such a barrier in the vicinity of the pond outlet structure. We agree that Pond-3 does not require a forebay or an oil and grit separator as long as the road has rural section roadside ditches. This can be reconsidered if the road is subsequently urbanized.

In Drawing P21 what drainage area is conveyed to the 600mm diameter culvert beside the outlet of Pond 1? Is it feasible to treat this runoff in the Pond? Drawings B7-9, B22-24 and E12 have outdated block numbers. Contour elevations in most drawings are illegible.

Tributary ‘A’, drawing 22490-01-C04, where the “existing pond is to be filled in with surplus soil” will require a sequencing /method of implementation plan. We have similar comments on the Trib ‘A’ crossing where construction sequencing; methodology; E/S; dewatering plans; timing of construction; length of time for the construction to occur will be required. In addition, there is an intent to run services such as sanitary sewer and water main parallel with Road ‘A’ but under the culvert and stream. Again construction details are insufficient

Downey channel relocation will require more detailed design. The channel should have benches and be allowed to form within a floodplain of predetermined width, unless more detailed justification can be provided. It is suggested in the EIR on page 123 that ‘channel morphology’ has been incorporated into the design but there is no evidence of this in the design. The 2 culverts at Road ‘A’ crossing, 50 cm in diam. do not have enough detail in the design. The proposed planting of the new channels are difficult to review due to lack of appropriate mapping linkage (L-09, L-10, etc). The timing of this relocation is a significant concern, We agree that the work, since it is in the ‘dry’, is not a real concern, however, few if any details

other than ‘dam and pump around the site’ are provided. We recognize that if it’s left up to the contractor to determine those bypass plans, the details will be provided through the permit process.

Storm water management facilities require more detailed design for the outlets from the SWM ponds as they relate to Hanlon Creek tributaries. We anticipate this would be determined through the GRCA Permit process.

Section 10.3, Monitoring, Tables 7 and 8, It is recognized that the amphibian monitoring program for the site uses a call survey, we suggest consideration for a salamander survey to be included in the monitoring program for a more comprehensive approach.

Snow Removal and Storage is identified on page 149 of the EIR. We suggest that Trib ‘A’ and Trib ‘A1’ be considered as “natural features” and not used as a place to dump the snow. The swales should not be used for this either

Yours truly

Fred Natolochny
Supervisor of Resources Planning
Resources Planning

cc AECON
Natural Resource Solutions Inc.
Astrid Clos, Planning Consultant
City of Guelph, Engineering Department
City of Guelph, Economic Development

AECOM

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March 31, 2009

Project Number: 54-22490

Fred Natolochny
Grand River Conservation Authority
PO Box 729
400 Clyde Road
Cambridge, Ontario
N1R 5W6

Dear Mr. Natolochny:

Re: Hanlon Creek Business Park
Subdivision Application 23T-03501

We provide the following response to your March 26, 2009 correspondence. As previously discussed, we are planning to attend the April 8, 2009 EAC meeting to obtain approval. We would appreciate an approval letter from GRCA prior to this meeting.

Our comments refer to numbering of your comments.

1. The MOE design manual does not stipulate that the forebay calculations account for decreased depth as sediment accumulates. We have received numerous approvals without calculating the dispersion and average velocity as indicated in your letter. However, we attach a calculation summary for all the forebays using the method you requested. The calculations indicate that the theoretical cleanout period is 8 to 10 years. We expect the actual clean out frequency will be greater than this after the initial construction until the subdivision becomes more mature. The actual clean out time after the initial period will be dictated by the monitoring being conducted at the pond and receiving stream.
2. Although we believe that the armour stone dispersion chamber included in our design would satisfactorily encourage mixing with groundwater, we attach an alternative dispersion design for your approval. We have only included the design for Pond 4 with this letter. If you are in agreement with the concept we can provide full sized prints for Ponds 1, 3 & 4. The design includes a buried perforated pipe within the cooling trench. Manholes at the upstream and downstream ends of the pipe would facilitate maintenance and cleaning. The manholes would be fitted with ditch inlet tops set at an elevation that would ensure that outflow from the pond would be released below grade, yet allow for relief flow in the event of malfunction.
3. The design you referenced for the cooling trench has actually been constructed by another Engineer in our office. He indicated that the referenced design is prone to plugging and maintenance is very difficult (requires excavation and pipe replacement). Since both the high and low pipes are plugged, there is no practical method to allow flushing or cleaning. We prefer to not use that design.

AECOM

4. Through discussion with the City and design team, we agree that the monitoring period should be to 75% build out plus 2 years.

We trust this information is sufficient for your approval. We will respond to the remaining general comments in separate correspondence as they do not impact the overall design.

Yours truly,
AECOM Canada Ltd.

Rick Clement, P. Eng.
Rick.Clement@aecom.com

RFC/
Encl.
cc: File

400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

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April 3, 2009

Allan Hearne
Planning Department, City Hall
59 Carden Street, Guelph, Ontario
N1H 3A1

Dear Mr. Hearne,

Re: **Hanlon Creek Business Park – City of Guelph Subdivision File 23T-03501**

We have received a response to our letter of March 26, 2009 that has addressed the four points required for our support of the Planning Act process for this plan of subdivision. It is our understanding that the response was provided to the City of Guelph as well. The March 31, 2009 response by AECOM is acceptable for the purpose of satisfying our comments. At this point in our review of the plans and reports prepared in support of this subdivision, we have no objection to the draft plan Phases 1 and 2 proceeding.

As noted in our March 31, 2009 letter, we have a number of detailed design considerations that remain outstanding, but we can support the overall concept and we would, subject to the detailed review, have no objection to Phases 1 and 2. We trust that the comments previously provided in an advisory capacity can be accommodated through our permit review process.

Items that we believe should have further discussion, but are not required to demonstrate no negative impact, include the treatment of Laird Road near the culvert, the monitoring program and the issues to be considered for Phase 3

Referring to Hanlon Creek Business Park, conditions of Draft Approval, OMB Approval in Principle June 6, 2006:

Prior to grading and site alteration
12. That the Developer shall prepare an Environmental Implementation Report (EIR) based on terms of reference approved by the City and Grand River Conservation Authority (GRCA). The EIR shall confirm the recharge targets to be met and the developers' responsibilities to demonstrate how the recharge targets are to be met through the site plan approval process. Such a report will include a monitoring program to assess the performance of the storm water management facilities and to assess seasonal trends in water levels in the core wetlands through monitoring of water levels in the wetland. The monitoring program for stormwater facilities will include temperature and stream flow monitoring of Tributary A between Laird and Road A. Modelling of summer temperatures on a continuous-in-time model basis shall be undertaken to demonstrate that SWM Ponds 4 and 5, have no significant negative impact on coldwater habitats in Tributary A from temperature increases, to the satisfaction of the GRCA. The following factors are to be considered in the modelling:

1) *Magnitude off temperature difference*
2) *Duration of discharge*
3) *Characteristics of fish species.*

The EIR shall establish post-development recharge infiltration rate targets that set target infiltration rates on a block-by-block basis through a block-by-block groundwater infiltration reassessment taking into account the spatial distribution of infiltration with special attention to the effects of depressional topography. The developer shall implement all recommendations of the EIR to the satisfaction of the City and GRCA. Further the developer shall address all items and recommendations expressed in the Hydrogeological Report, the Environmental Advisory Committee comments including the detailed comments from the City's former Environmental Planner and the Guelph Field Naturalists comments, and include consideration of the Hanlon Creek State of the Watershed study, to the satisfaction of the City and the GRCA, prior to registration of the plan.

We have reviewed the following documents, reports and drawings:

- January 2009 Storm Water Management report (AECOM)
- February 9, 2009 Environmental Implementation Report (NRSI)
- December, 16, 2008 Memorandum – AECOM (Nicole Weber) response to Stream Temp. Impact Report review.
- January 27, 2009 Stream Temp Impact Report (AECOM-EbnFlow(Bob Walker)) – same as prior report but includes findings of the Dec. 16 memo.
- Drawings last revised 27/02/2009
- March 31, 2009 letter from AECOM with accompanying drawings
- Banks Groundwater Engineering limited, May 2008 with supplemental information

Based on our review, we are satisfied with the design to the level of detailed undertaken in our review to date. The EIR by Natural Resource Solutions provides direction for monitoring and includes the recommendations required for infiltration, sediment and erosion control, storm water and thermal impacts. We accept the continuous in time temperature model from AECOM as satisfactory in predicting the potential for impacts on the water temperature for Tributary A. We accept the model prediction that SWM Ponds 4 and 5 have no significant negative impact on coldwater habitats in Tributary A.

Agency conditions
67. Prior to any grading or construction on the site and prior to registration of the plan, the owners or their agents submit the following plans and reports to the satisfaction of the Grand River Conservation Authority:

a. *A detailed stormwater Management Report in accordance with the MOE Planning and design Manual, 2003*
b. *A final Hydrogeological Assessment Report to show how infiltration will be maintained throughout all phases of the development.*
c. *An erosion and siltation control plan in accordance the Grand River Conservation Authority Guidelines for sediment and erosion control, indicating the means whereby erosion will be minimized and silt maintained on the site throughout all phases of grading and construction.*
d. *Detailed lot grading and drainage plans.*

The information provided appears adequate to satisfy condition 67. As there may be requirements for temporary works and the scheduling/timing of works is still not certain, we will wait to clear this condition.

68. *Prior to grading or construction on the site, that appropriate Fill Construction and Alteration to Waterways permits be obtained.*

We have been advised that a permit application will be submitted. It is our intention tot refine the plan in some areas through the permit approval process. These areas are minor and would not impact the overall development scheme.

69. *That the subdivision agreement between the owners and municipality contain provisions for the completion and maintenance of the works in accordance with the approved plans and reports.*

We have no comment on this point at this time.

Yours truly

Fred Natolochny
Supervisor of Resources Planning
Resources Planning

cc AECON
Natural Resource Solutions Inc.
Astrid Clos, Planning Consultant
City of Guelph, Engineering Department
City of Guelph, Economic Development

400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6
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May 25, 2009

City of Guelph
59 Carden Street
City Hall
Guelph, ON N1H 3A1

Dear Sirs:

Re: Conditions to be Satisfied Prior to Issuance of Permit No. 327/08 to develop an industrial subdivision at Lots 16, 17, 18, 19 and 20, Concession 4 and 5 in the City of Guelph

The General Membership Committee of the Grand River Conservation Authority approved your application on May 19, 2009 to develop an industrial subdivision at Lots 16, 17, 18, 19 and 20, Concession 4 and 5 in the City of Guelph with the following conditions:

1. **That an on-site pre-construction meeting be held with the applicant, consultant, contractor and Grand River Conservation Authority staff, to review construction sequencing, dewatering and erosion and sediment control measures, to the satisfaction of Grand River Conservation Authority staff.**
2. **That the applicant provide plans and specifications for any temporary works required to implement the plans provided for Phases 1 and 2 to the satisfaction of Grand River Conservation Authority staff.**

The permit will be issued upon satisfaction of the above noted conditions. **Please note that the conditional approval is valid until May 19, 2011.**

If you have any questions regarding this letter, please contact me.

Yours truly,

Fred Natolochny
Supervisor of Resource Planning
Resource Management Division

FN*cb

c.c. Clerk, City of Guelph
Astrid Clos, Astrid J. Clos Planning Consultants
Aecom c/o Rick Clement
Natural Resource Solutions Inc. c/o David Stephenson

MNR Correspondence/Comments

Ministry of Natural Resources | **Ministère des Richesses naturelles**

Guelph District
1 Stone Road West
Guelph, Ontario
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Telephone: (519) 826-4955
Facsimile: (519) 826-4929

Ontario

May 25, 2009

Suzanne Young – Environmental Planner
Planning Services – Community Design and Development Services
City of Guelph

Dear Ms. Young:

RE: Hanlon Creek Business Park – Jefferson Salamander, Ministry of Natural Resources (MNR) Preliminary Recommendations

Thank you for the opportunity to review the information that has been submitted in support of the development of the Hanlon Creek Business Park. Ministry staff has reviewed the site plans, in conjunction with the Consolidated Environmental Impact Study (CEIS) and the location of the salamander occurrence, and offer the following preliminary comments for consideration with respect to Jefferson Salamander (threatened) and the two work areas of immediate concern to the City (road A and excavation in the southeast).

Jefferson Salamanders are most often associated with deciduous or mixed woodland habitat, where they forage and overwinter. In early spring, individuals migrate to ponds found either within or in proximity to these woodlands to breed. Breeding ponds usually consist of vernal pools fed by groundwater, snowmelt or surface waters, but other wetland types with permanent or semi-permanent water can also be used for breeding. When breeding ponds are not present in the woodland in which they reside, individuals will migrate through agricultural fields, early succession stage habitat and across roads if necessary to reach a breeding pond.

Jefferson Salamander individuals are currently protected under the Endangered Species Act (ESA 2007). A proposed description of the species' habitat to be protected by regulation is currently posted on the Environmental Registry for comment at www.ebr.gov.on.ca (Registry # 010-6490). It is anticipated that a habitat regulation will be finalized by July 2009.

The Ministry understands that the location of the proposed excavation in the southeast portion of the site is well removed from the core area of the Hanlon Creek Swamp provincially significant wetland (PSW) complex and associated upland forest/meadows, where the salamander occurrence was recorded. It is the Ministry's opinion that the potential for Jefferson Salamander to be located in the southeast extremes of the subject area is negligible, due to the minimal habitat afforded to the species at this location. The Ministry therefore has no significant concerns with work proceeding in this area. However, the Ministry recommends that if a salamander is discovered in this area at any point during the construction period, that work should stop immediately and the Ministry should be contacted for further direction.

However, due to the fact that the location of Jefferson Salamander breeding pond(s) on the subject lands is currently unknown, the precautionary principle should be applied to avoid impacts to the species and/or habitat. In review of the proposed orientation of road A, and the proximity to the salamander occurrence and contiguous natural features of the site, the Ministry recommends that

development of road A should not proceed until the site has been re-examined for potential Jefferson Salamander habitat and the implications of the ESA have been considered.

The Ministry would be pleased to discuss this matter in more detail with the consultant and the City, in order to address the appropriate next steps that should be considered under the ESA. To help facilitate this discussion, it would be appreciated if the consultant could circulate to the Ministry the reports that document the conditions, methodology and results of the previously permitted Jefferson Salamander survey.

The Ministry understands that the orientation of road A will require minor encroachment within the PSW complex (boundaries staked by GRCA), to facilitate the removal of the on-line pond and the construction of the culvert headwalls. The Ministry does not support infrastructure development within a PSW complex, unless the activity has been appropriately considered under an environmental assessment (EA) process (PPS 2005). The Ministry would like the opportunity to review the City's evaluation of road A, and how the preferred route meets the tests incorporated within the City's EA documentation (i.e. assessment of alternatives).

In light of the above comments, the Ministry recommends that the development of road A be deferred until the implications of the ESA are evaluated.

Please contact the undersigned if further comment or clarification is required.

Sincerely,

Dave Marriott

A/ District Planner
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Ministry of Natural Resources
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Ontario

July 31, 2009

Hans Loewig – Chief Administrator Officer
City Administrators Office
City of Guelph

Dear Mr. Loewig:

RE: Hanlon Creek Business Park – Construction of Municipal Services - Ministry of Natural Resources (MNR) Comments

The Ministry appreciates the opportunity to review the information that has been submitted in support of the continued development within the Hanlon Creek Business Park (HCBP). Ministry staff have reviewed the City's response to the Ministry's preliminary recommendations dated May 25, 2009, and the attached Salamander Monitoring Status Report (SMSR 2009) developed by the consultant. The Ministry offers the following comments for consideration with respect to Jefferson Salamander (threatened) and the implications of the Endangered Species Act (ESA 2007) on proceeding with the construction of municipal services for Phases 1 and 2 of the HCBP.

The Ministry acknowledges the significant planning history associated with the HCBP development, and the planning approval given by the Ontario Municipal Board (OMB Decision No. 3143) on November 8, 2006. However, the ESA (2007) came into force on June 30, 2008. At that point, Jefferson Salamander individuals received immediate protection under the legislation. To help promote awareness of the ESA (2007), MNR Guelph District sent an invitation to all municipalities within Guelph District's administrative boundary, to attend a full-day information session (January 27, 2009) on the legislation. This session provided detailed information on the Act's prohibitions, and indicated that the ESA (2007) is binding on everyone. More specifically, the onus is on the person that will undertake the activity, including project proponents and contractors hired by proponents to carry out the activity on their behalf, to ensure they will not contravene the ESA (2007).

To inform potentially affected planning agencies of the draft habitat regulations of the species, the Ministry circulated to the City of Guelph (May 22, 2009), advising you of our Ministry's consultation initiatives relative to a proposed habitat description for Jefferson Salamanders. The draft habitat description has been posted on the Environmental Registry (www.ebr.gov.on.ca, # 010-6490) since May 15, 2009.

The proposed description of habitat to be regulated under the ESA (2007) for Jefferson Salamanders, which is anticipated to be finalized in mid-August 2009, states that:

i. a wetland, pond or vernal or other temporary pool that is being used by a Jefferson Salamander or Jefferson dominated polyploid, or was used by a Jefferson Salamander or Jefferson dominated polyploid at any time during the previous three years;

ii. an area that is within 300 meters of a wetland, pond or vernal or other temporary pool described in subparagraph 'i' and that provides suitable foraging, dispersal, migration

or hibernation conditions for Jefferson Salamanders or Jefferson dominated polyploids; and

iii. an area that provides suitable conditions for Jefferson Salamanders or Jefferson dominated polyploids to disperse from an area described in subparagraph 'i' to a wetland, pond, vernal or other temporary pool that would provide suitable conditions for Jefferson Salamanders or Jefferson dominated polyploids, if the wetland, pond or vernal or other temporary pool is less than 700 meters from the area described in subparagraph 'i'.

In light of the above information, the Ministry is concerned that the continued development of municipal services within the HCBP potentially may lead to a contravention of s.9 (1) and/or s.10 (1) of the Act. This concern originates from the fact that development is proceeding despite the recent discovery of the species on the subject lands, and in the absence of due consideration to the location of the species habitat.

The Ministry has particular concerns with the evidence and conclusions presented in the SMSR (2009) documentation to support the continued development of municipal services, including but not limited to:

i. The discovery of a dead salamander within the HCBP area on April 20, 2009 suggests that Jefferson Salamander and their associated habitat occurs on or near the subject lands.

ii. The SMSR (2009) concluding statements assume that habitat for the species is restricted to breeding habitat, when habitat for the species includes many habitat descriptions referenced in subparagraph i and ii of the draft habitat regulations. The presence of dry conditions in the woodlot, located directly north of culvert crossing A, simply indicates that the woodlot does not contain breeding habitat. However, the north woodlot, the wetland complex to the south, and the area between the north woodlot and the wetland may constitute foraging, dispersal, migration or hibernating habitat. Studies have yet to be undertaken to determine where these habitat types may exist on the subject lands.

iii. The minnow trap surveys were concluded prematurely on April 9th given that the spring movement period, extended at the very least until April 20th. This fact is consistent with the methodology documented in the SMSR (2009) for the Southwest Kitchener site, where the survey was successful in detecting salamanders on and after April 20th.

iv. The methodology documented in the SMSR (2009) does not indicate the density of minnow traps per wetland feature monitored or make a comparison between other relevant studies. Therefore, it is possible that the density of minnow traps was insufficient given the size of the identified potential breeding ponds to detect the species.

v. The SMSR (2009) does not cite any literature to support the conclusion that a species is absent from one location when it is detected in another location during the same time period. Published inventory standards consistently assert that it is extremely difficult to

make such a conclusion, due to (i) rare species are by definition difficult to find and (ii) the potential for studies to be designed and/or carried out differently across site locations.

vi. The SMSR (2009) states that a larval survey was conducted to determine presence/absence of salamanders. The Ministry stated in our letter dated June 29, 2009, sent concurrently with the issuance of permit # 1052211 to the consultant, that larval inventories cannot confirm absence of the species. Consistent with published inventory standards, dip-netting for salamander larvae is a type of study known as *presence/not detected*. The Jefferson Habitat Recovery team does not support this inventory method, due to the high probability of a false negative result.

The Ministry notes that the construction of Culvert A, adjacent to Blocks 3, 5, 6 and 8 of the HCBP engineering design, was initiated on July 6, 2009. In review of the Ministry's preliminary recommendations to the City (May 25, 2009), the Ministry recommended that the development of Culvert A should not proceed until the site was further examined for Jefferson Salamander habitat and the implications of the ESA (2007) had been considered.

The consultant's position that Jefferson Salamander habitat is not in the vicinity of the Road A crossing, and that impacts of the culverts' installation and associated activities (i.e. vehicular and construction equipment access) will not impact habitat for the species, is not supported by the SMSR's (2009) data/conclusions, nor its lack of acknowledgment of the draft habitat regulations. Based on the surveys completed to date, and the questions still left unanswered regarding compliance with the prohibitions of the ESA (2007), the Ministry is not in the position to support this conclusion.

In review of the locations subject to further investigation, identified within Figure 3 of the SMSR (2009), the City has concluded that potential habitat for the species is not sited in the vicinity of the planned municipal servicing areas, "especially Road A and D." The Ministry notes that the orientation of Road A is directly adjacent to habitat survey Site 2, identified on Figure 3, and is therefore well within the 300 meter radius of the potential breeding habitat as defined by subparagraph ii of the draft habitat regulations.

In addition, it is understood that the City is currently in negotiations to acquire Block 15 from Belmont Equities. The Ministry has been requested by the consultant to confirm the potential ESA (2007) implications for Block 15; scheduled to contain stormwater management (SMW) facility #3. Due to the lack of vernal pools, Block 15 does not contain suitable breeding habitat for the Jefferson Salamanders. Notwithstanding, based on the aforementioned habitat regulations, the Ministry is of the opinion that the potential exists for Block 15 (in-part or completely) to be regulated as migratory or dispersal habitat. This opinion is based on: (i) the location of the occurrence mortality directly south of Block 15, (ii) the subject area's centralized orientation between potential breeding habitat (300 meters) indentified on figure 4.0 of the SMSR (2009), and (iii) the extent of contiguous natural features on and adjacent to the subject area. However, in the absence of comprehensive habitat information for the species on site, the Ministry notes that it is premature to determine the definitive development or valuation impacts on Block 15 with respect to the ESA (2007).

The Ministry acknowledges the City's commitment to "exercise extraordinary diligence" for indentifying the presence of Jefferson Salamander during the construction of municipal services. However, the Ministry suggests that this approach is problematic, because even if the individuals of the species are

not present within the vicinity of the area subject to development, the area may nevertheless be regulated habitat.

The Ministry recommends that the City provide evidence that development of municipal services within the HCBP will either not occur within regulated habitat, or that the activity scheduled to occur on regulated habitat will not damage or destroy said habitat. Based on the current surveys afforded to the site, and the Ministry's documented concerns, additional studies are required to satisfy the questions still left unanswered (i.e. extent and location of habitat). The Ministry recommends that these studies include a more thorough minnow trap inventory in March through April 2010 (exact dates will depend on weather conditions) and a subsequent movement study employing the pitfall trap-drift fence methodology.

In light of the above comments, the Ministry is not in a position to support the continued construction of municipal services for Phases 1 and 2 of the HCBP in the absence of complete information regarding the extent of Jefferson Salamander habitat. In the absence of complete information the precautionary principle should be applied to ensure development does not contravene s.9 1(a) and/or s.10 1(a) of the ESA (2007). Pending the identification of habitat afforded to Jefferson Salamander within the subject lands, the orientation of municipal services cannot be definitively considered as designed to be "compatible with the habitat and wetland features interior to the HCBP", as suggested in the City's June 29, 2009 correspondence.

Please contact the undersigned if further comment or clarification is required.

Sincerely,

Originally Signed By

Ian Hagman
Guelph District Manager
Ministry of Natural Resources
519-826-4931

Ministry of
Natural Resources

Ministère des
Richesses naturelles

Ontario

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Communications Services Branch

Fax

To:	Mayor Karen Farbridge	**From:**	Hon. Donna Cansfield
Fax:	519-822-8277	**Pages:**	7 (inc coversheet)
Phone:		**Date:**	August 27, 2009
Re:	Hanlon Creek Business Park	**cc:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Ministry of Natural Resources

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MNR3006MC-2009-2542

AUG 2 7 2009

Her Worship Karen Farbridge
Mayor
City of Guelph
City Hall, 1 Carden Street
Guelph ON N1H 3A1

Dear Mayor Farbridge:

Re: Hanlon Creek Business Park

I have received the decision by the Honourable Justice Gray regarding the injunction request for the Hanlon Creek Business Park (HCBP) in Guelph, Ontario, and the ruling respecting a decision from me for a Habitat Protection Order.

The court ruling stops work with respect to the culvert and access road at the site and provides 30 days to decide whether a Habitat Protection Order should be issued pursuant to s. 28 of the *Endangered Species Act, 2007* (ESA) in light of the discovery of a Jefferson salamander hybrid on the site.

I am aware that the city would like to complete the installation of a culvert and water main at Road "A" crossing of Hanlon Creek, within the HCBP. I expect the city to proceed with the plan that was developed with ministry staff from Guelph District and Dr. Jim Bogart (Chair of the Jefferson salamander Recovery Team) on August 14, 2009. The enclosed protective measures plan for the Road "A" culvert project, dated August 21, 2009, shall be implemented by the city.

Based on my review of the salamander data for the area, the existing site conditions, the proposed works and the protection measures proposed by the City of Guelph for the protection of potential impacts on Jefferson salamander, I do not intend to make a Habitat Protection Order under section 28 of the ESA. I am not persuaded that the reasonable grounds necessary for the issuance of such an order are present with respect to either the culvert or the road leading up to it, provided the city fulfills its commitments by limiting construction activities to the culvert and water main, and by implementing the protection measures noted in the enclosure.

...2

It is also my understanding that the city has committed to undertake additional salamander monitoring in order to provide the data necessary to determine whether there are Jefferson salamanders, and their habitat, on the site. Should the monitoring determine that there are Jefferson salamanders on the site, the Ministry of Natural Resources will work with the City of Guelph to determine the necessary steps to meet the requirements of the *Endangered Species Act*.

My ministry is committed to working with the city to provide advice and guidance for this study and we look forward to developing a long term protection plan for Jefferson salamanders within the HCBP. If you have any further comment, or if clarification is required, please contact Al Murray, Guelph Area Team Supervisor, at (519) 826-4914.

Sincerely,

Donna Cansfield

Donna Cansfield
Minister of Natural Resources

Enclosure

c: The Honourable Justice J. Gray
Eric Gillespie, Legal Counsel
Al Murray, Guelph Area Team Supervisor

August 21, 2009

Ken Cornelisse
Planning and Information Management Supervisor
Ministry of Natural Resources
Guelph District Office
1 Stone Road West, 1st Floor
Guelph, ON N1G 4Y2

Dear Mr. Cornelisse:

RE: Salamander Protection Measures Plan
Hanlon Creek Business Park – Road 'A' Culvert Project

Further to our meeting of August 14, 2009 with the Ministry of Natural Resources (MNR) staff and Dr. Jim Bogart, we are pleased to submit this Salamander Protection Measures Plan for the Road 'A' Culvert project located in Phase 1 of the Hanlon Creek Business Park (HCBP).

The purpose of the Salamander Protection Measures Plan is to address concerns related to the protection of potential Jefferson salamanders in the vicinity of the Road 'A' Culvert area during construction. The Salamander Protection Measures Plan is based on discussions during the August 14, 2009 meeting to best anticipate and address potential Jefferson salamander movements in the vicinity of the culvert construction area. We greatly appreciate the input provided by MNR staff and Dr. Bogart in this regard.

Salamander Protection Measures Plan

The timing of the Road 'A' culvert construction overlaps with the timing of potential dispersal of juvenile salamanders from their breeding ponds, and it is this potential dispersal that is the focus of the Salamander Protection Measures Plan. It is understood that the Jefferson salamander travels at night during rainfall events and they may use vegetative or other debris as cover to hide during the daytime. As such, the most effective form of protection of the Jefferson salamander juveniles during construction of the Road 'A' Culvert is to 1) ensure that any juveniles do not inadvertently enter the construction area in the immediate vicinity of the Road 'A' Culvert, and 2) ensure that the construction access road remains free and clear of any vegetative or other debris that may cause the Jefferson salamander to remain on the access road during the daytime.

.../2

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Specifically, the Salamander Protection Measures Plan for the Road 'A' Culvert construction consists of the following:

1) Isolation of the construction area during a "dusk to dawn" timeframe (from 30 minutes before sunset to 30 minutes after sunrise) when Jefferson salamander juveniles are most likely to be moving from breeding ponds to foraging or overwintering areas. This will be achieved by installing and maintaining silt fencing around the construction area as shown on drawing 110095-SK1.

2) A section of the silt fence at the access road from McWilliams Drive will be removed just before the start of construction each morning. This section of silt fence will be re-installed with the bottom keyed into the ground as detailed on drawing 110095-SK1 at the end of each work day.

3) Construction activities and vehicular usage of the access road will be restricted to the time period of 30 minutes after sunrise to 30 minutes before sunset.

4) Access to the site, including both vehicular and any pedestrian traffic, will be limited to the existing construction access road from McWilliams Drive.

5) The construction access road will remain free and clear of any vegetative or other debris that may encourage salamanders to remain on the access road during the daytime. The access road will be inspected to ensure it is clear of debris at the start of the work day before usage of the access road begins, and at the end of each work day once usage of the access road has ceased.

6) When rain is forecasted at night, the Environmental Inspector for the project will inspect the site before the end of the work day to ensure all mitigation measures have been implemented and are functioning properly.

We trust that the above Salamander Protection Measures Plan is consistent with what was discussed at the Friday, August 14, 2009 meeting.

.../3

Should you require any additional information or clarification, or if you would like to visit the site, please contact me at (519) 822-1260 ext. 2282.

Sincerely,

Colin Baker, P.Eng.
Environmental Engineer

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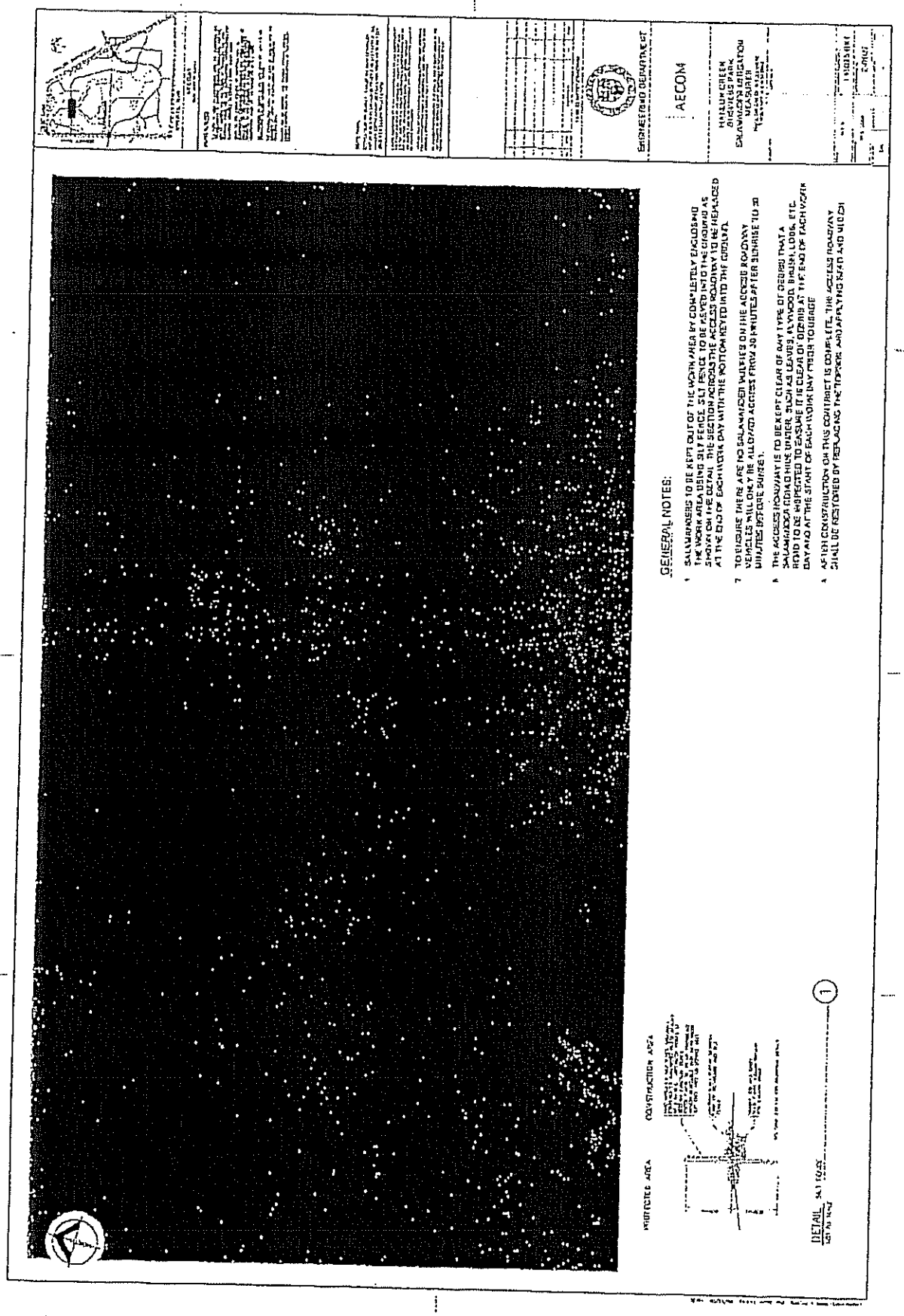
CB/kgb

C Karolyn Pickett, MNR
Dr. Jim Bogart, University of Guelph
Peter Cartwright
Rajan Philips
Suzanne Young
Dave Stephenson, NRSI
Tara Benton, NRSI
Jessica Grealey, NRSI
Rick Clement, AECOM

File # 16.212.0922


AECOM
GENERAL NOTES:
1. SILT BARRIERS TO BE KEPT OUT OF THE WORK AREA BY COMPLETELY ENCLOSING THE WORK AREA USING SILT FENCE TO BE KEYED INTO THE GROUND AS SHOWN ON THE DETAIL. THE SECTION ACROSS THE ACCESS ROADWAY TO BE REMOVED AT THE END OF EACH WORK DAY WITH THE BOTTOM KEYED INTO THE GROUND.
2. TO ENSURE THERE ARE NO SALAMANDER MORTALITIES ON THE ACCESS ROADWAY VEHICLES WILL ONLY BE ALLOWED ACCESS FROM 30 MINUTES AFTER SUNRISE TO 30 MINUTES BEFORE SUNSET.
3. THE ACCESS ROADWAY IS TO BE KEPT CLEAR OF ANY TYPE OF DEBRIS THAT A SALAMANDER COULD HIDE UNDER, SUCH AS LEAVES, PLYWOOD, BRUSH, LOGS, ETC. ROAD TO BE INSPECTED TO ENSURE IT IS CLEAR OF DEBRIS AT THE END OF EACH WORK DAY AND AT THE START OF EACH WORK DAY PRIOR TO USAGE
4. AFTER CONSTRUCTION ON THIS CONTRACT IS COMPLETE, THE ACCESS ROADWAY SHALL BE RESTORED BY REPLACING THE TOPSOIL AND APPLYING SEED AND MULCH
CONSTRUCTION AREA
DETAIL
1

Hanlon Creek Business Park
City of Guelph/Belmont/Consultants – MNR Meeting
September 23, 2009

Purpose of Meeting: To present to MNR specific projects within the HCBP that have been identified by the City, Belmont and consultants for construction during the Fall and Winter months, and to discuss the arrangements for salamander monitoring in 2010.

Attendance at Meeting: Hans Loewig, Margaret Neubauer, Peter Cartwright, Jim Riddell, Richard Henry, Rajan Philips, Colin Baker and Suzanne Young (City of Guelph); Ian Hagman, Ken Cornelisse and Karolyne Pickett (MNR); David Kemper (Belmont Equities); David Stephenson and Tara Brenton (NRSI); Rick Clement and Ray Tufgar (AECOM); Paul Husson (Pitura Husson).

Location: City of Guelph offices.

Summary of Action Items:

A) Fall / Winter Construction Projects (location maps attached)

1. Hanlon Expressway Watermain & Utilities Crossing
Tender expected to be issued before September 30; construction to start in November with substantial completion in March, and road restoration by end of April.

2. Laird Road: Amphibian movement culverts and drift fencing
Specified number of 1-metre wide culverts will be built und the roadway along with silt fencing on either side of each culvert. 2-3 days work limited to 6 metre wide open cut across the road right-of-way. Culvert work must be completed before end of November to restore roadway for vehicular travel. Drift fence installation along the road right-of-way will be undertaken after the snow season. Drift fences for salamander monitoring will also be installed as part of this contract.

MNR Observations: Caution that amphibian drift fence might interfere with salamander movements. To avoid this, prepare a drift fence plan that will complement amphibian protection and salamander monitoring purposes.

Action Item: Submit plan to MNR showing the location of amphibian culverts and fencing as well as salamander monitoring fencing. (NRSI / AECOM/City Staff)

3. HCBP Phase 1 Projects

3 (a) Downey Road reconstruction and adjacent site works: Reconstruction of Downey Road north of Road A including extension of services from the Kortright Hills subdivision, as well as site grading and expansion of the existing SWM Pond (# 2). The

work will extend into winter months. Wildlife in the SWM pond will be relocated to a suitable, alternative habitat prior to construction.

3 (b) Northerly Portion of Phase1 (East of Tributary A): Site grading, extension of services from Kortright Hills subdivision, minor internal road works, and the construction of a new SWM Pond (# 1). The work will extend into winter months.

3 (c) North-south section Road A from Laird Road and site works east of Road A: Construction of Road A and site grading of lands to the east of Road A.

MNR Observations: The MNR's concern in regard to all three proposed projects is about the implications for potential salamander habitats in the HCBP Phase 1 lands. To that end MNR will review these locations in relation to their mapping of the Phase 1 lands before providing response. MNR would require project location plans sent to them electronically as well as a follow up letter from the City in support of these projects.

Action Item: City staff and consultants to provide MNR with electronic files and submit formal letter in support of the projects. (AECOM/NRSI/City staff)

B) 2010 Spring Salamander Monitoring

MNR Observations:
MNR staff noted the following requirements for a comprehensive monitoring program in 2010:

- Input from Dr. Jim Bogart
- Plans showing monitoring locations including drift fencing, pit fall and minnow traps
- Monitoring duration including start date and end date
- Protocol for daily monitoring indicating monitoring times, responsiveness to weather changes etc
- Use of best practices and avoidance of omissions based on the experiences of salamander monitoring elsewhere in Ontario

Action Items:

- Set up meeting date with MNR and Dr. Jim Bogart (NRSI)
- Provide MNR with a monitoring proposal prior to the meeting (NRSI / City staff)

C) General Discussion: There was general discussion about the requirements of the ESA, the Regulations and the process to be followed for the HCBP development to proceed. City staff noted the following Action Item:

- Request the Minister of Natural Resources to extend the 2010 June 30th deadline for transition agreements now applicable to HCBP. Emphasize the planning and approval processes already completed for this development and its significance in the context of the Local and Provincial Growth Plans.

cc Peter Carteright

Ministry of Natural Resources

Office of the Minister

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Ministère des Richesses naturelles

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Ontario

MNR3006MC-2009-3585

DEC 17 2009

Her Worship Karen Farbridge
Mayor
City of Guelph
City Hall
1 Carden Street
Guelph ON N1H 3A1

Dear Mayor Farbridge:

Thank you for your letter and council's resolution and report regarding the Hanlon Creek Business Park (HCBP) development and the potential implications of the *Endangered Species Act* (ESA). I am pleased to hear about the collaboration between the city and the Ministry of Natural Resources Guelph District to address Jefferson Salamander and their habitat at this site.

I am confident that a well designed and implemented Jefferson Salamander monitoring program can help determine whether Jefferson Salamanders and/or their habitat are present in the HCBP. If Jefferson Salamanders and/or their habitat are not found, the city can continue development of the site as proposed and previously approved by various agencies.

In the event that Jefferson Salamander and/or its habitat are confirmed on the site, the work may proceed pending an authorization under the ESA. I am pleased to note that discussions between my staff and yours have confirmed that the project is eligible for an agreement as per the regulations made under the ESA (O.Reg. 242/08). As noted in your correspondence, the provisions for entering into an agreement are transitional and expire June 30, 2010. For that reason, I suggest our staff work together to develop the draft terms of an agreement in advance of the monitoring work so that the groundwork is in place to make a decision late spring pending the outcome of the monitoring program.

My staff are committed to helping the city assess and protect Jefferson Salamander and its habitat at the HCPB, as well as providing direction to the city with regard to the ESA.

Thank you again for writing.

Sincerely,

Donna Cansfield

Donna Cansfield
Minister of Natural Resources

c: Liz Sandals, MPP, Guelph

Environmental Groups Correspondence/Comments

Comments on HCBP EIR # 3 Part one

Overall I am pleased with the additions that have been made. Have the concerns, questions and issues raised by the agencies been satisfied yet?

3.0 Heritage Maple Grove –
1. Are the areas that contribute water to the vernal pools protected?

2. Is the kettle pond feature west of the Grove along Forestell Rd. including the cottonwood protected? Does it provide breeding habitat? It would make sense to protect it as part of the buffer along Forestell Rd. as it does provide diversity. As well if it is a kettle feature it could be over 13,000 years old.

3. Since the grove will be fenced and gated why cut down the hazard trees as they do provide habitat. The tallest dead tree in the grove appears to act as a staging area for migratory birds. I observed a large flock of robins (at least 25-40 birds) this last autumn flying in and perching in this tree. as I walked along Forestell Rd. to gather apples from the road side tree. If the park is gated and fenced the hazard trees could remain as part of the habitat and if a trail is developed only those that poise risk could be selectively cut. Therefore, no trees should be cut until a comprehensive plan is developed and approved.

4. When the grove becomes parkland we would like see a stewardship committee formed to help with rehab and restoration. Many of the heritage trees have unique features such as unusual bark bridges, “antique bark” and other features that could be easily vandalized. I support the gating and limited access to the grove until such time as a plan is developed in order to protect the trees.

Restoration Plantings.

I have attached info I found recently re the need for mast trees. I would like to see a greater diversity of native trees especially in the areas to be restored adjacent to the wetland and woodland. Some of these trees are already located in the HCBP such as Yellow Birch, Blue Beech(American Hornbeam) Bitternut Hickory (there used to be some on Kortright Hills Phase 4 but they were logged) Shagbark Hickory, Lindera Benzoin (shrub already one site) for the spicebush butterfly, Black Walnut, Butternut, M. Coronaria (Sweet Wild Crabapple)American Linden , Black Locust, Hop Tree, White Oak.

The mixture of shrubs should also contain more diversity. Other plantings need to contain more milkweed species for the monarch butterfly.

Trees on streets and to be recommended in site plans.

According to a recent Toronto Study "**INCREASING CANOPY COVER IN ASPHALT**

AND OTHER HARD SURFACE TREATMENTS by Justin Morgenroth 2005. In which she reviewed the health of trees in asphalt and other paved surfaces she found that;

"Other species expressing high proportions of 'Excellent' ratings included: Sugar Maple (Acer saccharum), White Ash (Fraxinus americana), Red Maple (Acer rubrum), Crab Apple (Malus spp.), Little-leaf Linden (Tilia cordata). These species did not differ significantly from one another with respects to proportion of 'Excellent' ratings. In terms of trees which expressed a significantly higher proportion of 'Excellent' or 'Good' trees, Colorado Spruce and Siberian Elm (Ulmus pumila) exceeded all other species. The next group of highly rated trees consisted of Sugar Maple, Red Maple, Honey Locust (Gleditsia triacanthos) and White Ash. Conversely, the species which displayed the largest proportion of trees with 'Poor' ratings were Silver Maple (Acer saccharinum); Crab Apple, Red Oak (Quercus rubra) and Mountain Ash (Sorbus.sp)

This study (attached) may be applicable to the site design of individual lots and suggests that trees will survive when growing in asphalt environments such as playground. Can they also be planted in parking lots to help cool the temperature of the run-*off?*

Monitoring

Amphibian Monitoring: When mortality checks are carried out on Laird RD. this needs to be conducted at night because during the fall migration of 2008 very few amphibians were noted to be left on the road in the AM. Versus the hundreds found in the late evening before midnight. . Also should there be an additional monitoring site in the kettle feature on the west side of the grove on Forestell Rd.?

I could not find a map with the new monitoring station locations. Should Figure 1 Terrestrial Monitoring Stations be updated to add these new stations? Do the monitoring results in the appendices include the species found on the additional monitoring stations?

Thermal Modelling - Dr. Whitley has confirmed with me that the Settlement Conditions with respect to the Thermal Modelling have been met

Laura Murr

1. Berms: Section 5.2

I understand the rationale for constructing the berms early in the construction phase. However it was my understanding that the berms were to provide noise mitigation in addition to the aesthetic benefits of creating a visual buffer for Kortright Hills residents. Thus the wording (see below) "a minimum of 2 m high". indicating that it was a "minimum height". Once the berms are constructed and landscaped what happens if an industry wants to locate next to the berm and their noise studies indicate that noise levels will exceed MOE guidelines? How will the city require the landowner to mitigate noise since these noise studies are usually done late in the process because noise studies require details of building design, ventilation fans, etc. ? The same comments would apply to the berms along Forestell Rd.

Section 5.2 Berms

Block 2, 3, 9 and 10
A zoning by-law specific to the Hanlon Creek Business Park states that "the developer construct a minimum 2m high landscaped berm abutting Blocks 2, 3, 9 and 10 to satisfaction of Director of Planning and Development Services, prior to registration of any phase of development including blocks abutting the berm." Planting plans that satisfy the Director of Planning and Development Services have been prepared. The planting plans have been designed to increase aesthetic appeal of the berm, while providing a visual barrier comprised of native deciduous and coniferous species for neighbouring residences. Recommended plantings for Block 2, 3, 9 and 10 are provided in restoration planting plan L-02, L-03 and L-04 (back pocket of EIR)."

These questions arise from the Appendices "Hanlon Creek Business Park Environmental Implementation Report - Public Comments"

2. Grading Questions:

a. Below are the question and answers related to the impacts of grading on foundations? The line "This survey would probably extend to the homes along Teal" should be changed to read "will be required". Given the large amounts of fill and the grading and compaction required the pre-inspection of homes in potentially impacted areas should be required especially now since the SWM pond will be? Removed and enlarged next to Teal Drive.

Question: "How will grading of HCBP impact Kortright Hills residents foundation? Answer: It is usual practice to have a pre-development survey completed for homes adjacent to construction. This survey would probably extend to the homes along Teal Drive that back onto the subdivision and the Homes on Tanner Court.

Question: "Do developers plan to inspect homes along Teal and Milson prior

to the start of site grading?"
Answer: "It is usual practice to have a pre-development survey completed for homes adjacent to construction. This survey would probably extend to the homes along Teal"

b. Grading – restoration and dust control

In the EIR, the following is recommended for initial and ultimate grading areas: *"areas not built upon within 90 days of being cleared and/or graded must be seeded." The application of a seed mix on any graded area will help reduce the introduction or spread of invasive species. Grading will occur outside of the staked restoration areas and PSW's, eliminating or reducing the spread of invasive species."*

What will these graded areas be planted with and how will these plants establish themselves on fill with no top soil? Also 90 days seems like a long period to leave hundreds of thousands tones of fill to blow in the wind. If the HCBP gets graded in the spring and no lots are sold the fill will be blowing the entire summer especially during periods of drought. Blowing PM 10 and 2.5 are health hazards to humans and other species. If there is no purchaser interest in any lots when the construction phase and grading are finished these areas should be seeded immediately to allow time for plants to establish themselves. This will help to prevent silting of the drainage ditches, SWM and wetlands.

3. **Amphibians**:
Question: "Has the Western Chorus frog recovery team been notified of the HCBP frog population?
Answer: The recovery team has not been notified of the HCBP frog population."

The recovery team should be notified and consulted as part of the EIR requirements.

Amphibian tunnels:

Answer: "Based on a review in the field with staff of the GRCA, AECOM and NRSI, it was decided that there is not enough room along either side of Laird Road to construct mechanisms that will funnel wildlife through the culverts without impacting the adjacent wetlands; however, mechanisms should be put in place, such as speed limit and wildlife crossing signs while Laird Road remains open."

Are you suggesting that a frog can out hop a car or truck doing the posted speed limit of 50 KM? How will speed limits help the frogs and snakes? This is unrealistic. If it is cool they are slow moving and also they migrate at night and freeze when they are caught in the headlights so decreasing the speed limit would not appear to be a viable option. As for a wildlife crossing sign how will this help? The spring peers are so tiny we could barely see them to help them across the road let alone a person in a car or truck. Until the laird Rd. interchange is built is it possible to a) close the road during peak

migrations b) allow rescue teams to help the frogs and snakes across the road e.g. a similar rescue happens at Wolfond park each year.

"Construction of Phase I and II of the HCBP are not anticipated to substantially increase the use of Laird Road through the core natural area, as road connections will route traffic to Laird Road nearer to the Hanlon Expressway"

This statement seems unrealistic as the Straddioto property in the middle of Laird Rd. and the wetland complex will developed thus it will built up between 2 of the major migration routes. Since this property has not yet been sold how can you predict that there will be no increase in 24/7 traffic?

Please indicate whether the new SWM ponds near Laird Rd. will become amphibian habitat?

4. Recommended timing of future remediation of SWM ponds

"The SWM ponds within the HCBP will not be removed. It is recommended in the revised EIR that the timing of cleanout/remediation must respect the amphibian breeding season (early April to June) and hibernation period for herpetofauna species (late summer)."

The suggested timing of the breeding period does not appear to take in the months that tadpoles remain in ponds. For instance – green frog's tadpoles remain over the winter months. Remediating a pond that contains green frog tadpoles without any rescue effort could potentially wipe out all the juvenile green frogs for the next summer. Therefore I would like to suggest that the EIR recommend that an individual assessment of wildlife habitat and rescue plan be conducted on each SWM before it is remediated. (See attached letter re what happened to SWM in Kortright Hills)

5. Seed mixtures:

Thank you for adding this.

Additional species have been added to the recommended seed mixtures to increase viability and diversity. Standard Notes were included in the SWM Pond planting plans from the June 2008 EIR, and have also been included in the Restoration Tender Package, stating that seed mixes be installed with a nurse crop of annual oats.

6. Tree Saving and Plantings

Overall, the loss of trees within Phase I and II will result in approximately 13.2ha of land. Based on planting plans, as well as the proposed street tree planting plan, it is projected that there will be approximately 2,533 trees and 4,937 shrubs planted throughout

Phase I and II. Active and passive restoration areas will cover approximately 32ha of land. Over-time (assuming an average canopy radius of 5m), it is projected that the planted trees will provide approximately 20ha of canopy cover. It should be noted that the restoration areas will be planted up with approximately 4,937 shrubs and seeded with a mixture of native grass and herbaceous seed mix.

Since you are including shrubs in your estimate of future canopy cover. Please indicate what shrub canopy cover will be removed in the grading of the HCBP? Will it be more that 13.2 HA of trees?

Please give an estimate in years of how long it will take the new plantings to provide the same canopy cover and ecological benefits as the removed trees and shrubs

Please indicate if the planting guidelines and protection are similar to the 2003 Aboud Study:

Tree Protection Recommendation Study
City of Guelph, Guelph, 2003

This investigation assisted the development of the City's tree protection policy of new subdivisions and infill developments. The study included a review of practices of other municipalities in southern Ontario, and recommendations of best management practices of a tree protection policy for the City of Guelph. The study included the preparation of tree conservation plans, tree protection during development, and compensation for tree/habitat damage or destruction

7. What will be feasible and effective in terms of lot level controls, for example, on parking lot run-off with respect to oils, grease, dust fall components etc?

Requirements for on-site lot level controls will be reviewed by the City at the site plan stage. Possible measures include oil/grit interceptors and spill containment structures, grassed swales, etc.

The EIR needs to identify how parking lot run off will be mitigated see attached pictures of snow pile residuals taken this spring at the commercial properties on Stone Rd. Note the garbage, amount of? Contamination as evidenced by the dark areas on the piles.

8. Hanlon Creek Business Park - Site Plan Recommendation Checklist

Please add: (these are in the checklist for London Ontario)

☐Night lighting facilities

☐Disposal of waste water
Application: Fire route location / fire hydrants / fire dept.

connections / annunciator panel

9. Comments on 7.1.3 Continued Groundwater Monitoring

Depending on the types of industries that locate in the HCBP and the chemicals they are using wouldn't it be prudent add a recommendation to monitor groundwater quality as well as the recommended groundwater levels? This could be used for an early warning system for the potential future contamination at the Downey Rd. Well.

10. Stream Reach Lengths Figure 5

? accuracy of the mapping of Tributary A1 south of Laird Rd. In the figure appears cross Laird via the culver and then to runs parallel to Laird Rd.(South Side) and then dead ends in the ? ditch on laird Rd. However in the field this section of the creek appears to flow north out of the wetland (Block 11) South of Laird Rd. before it flows along the ditch and then flows north thru the culvert. I suggest that your mapping of this reach is incorrect?

11. Pre during and post in stream water quality monitoring

"**From the Laurel Creek Watershed Study:**
http://www.city.waterloo.on.ca/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/LIBRARY_STAFFREPORTS_documents/laurelcreek01.pdf

This study indicates that:

Surface water quality is a key leading indicator of environmental conditions for pre-, during and post-development activity. Pg. 30

The study identifies that "Phosphorus, suspended solids, dissolved oxygen, water temperature and bacteria were identified as appropriate indicators of the physical and chemical quality of the water"

Laurel Creek Water Quality monitoring, indicators and targets: (see below) Will these be measured in the HCBP and in the lower Tributary A before it exits the HCBP lands? Please compare the HCBP monitoring to that being conducted in the HCBP since City Council directed staff to look at the Laurel Creek Monitoring program in relation to the HCBP.

Table 2.2: Water Quality Indicators and the Associated Targets Indicator Target
Phosphorus In stream maximum 30 ug/L (upstream of Laurel Creek Reservoir)
In stream maximum 80 ug/L (downstream of Laurel Creek Reservoir)
Suspended Solids In stream maximum 25 mg/L
Water Temperature Warm water Fishery (Downstream of Laurel Creek Reservoir)

• Maximum in stream temperature of 26oC (June1-August1)
• Maximum in stream temperature of 29oC (Aug.1-Oct.31)
Coldwater Fishery (Upstream of Laurel Creek Reservoir)
• Maximum in stream temperature of 22oC (April 1- Oct. 31)
• Minimum in stream temperature of 4oC (Nov. 1-March 31)
• Maximum in stream temperature of 14oC (Nov. 1- March 31)
Dissolved Oxygen Warm water Fishery (Downstream of Laurel Creek Reservoir)
• Minimum 5 mg/L
Coldwater Fishery (Upstream of Laurel Creek Reservoir)
• Minimum 6 mg/L
E. coli • Class 1 Recreation- 100 CFU/100 ml (at Laurel Creek Reservoir)
• Class 2 Recreation- 2000 CFU/100 ml (all monitoring locations)*

Bethnics - *EPT Index* *(EPT Index measures:* The number of mayflies (Ephemeroptera), stoneflies (Plecoptera) and caddisflies (Tricoptera),is a simple index (EPT index) which provides an indication as to whether or not the animals at a site are tolerant of stressful conditions. The number of EPT should be high at undisturbed sites and decrease in proportion to increasing stress, such as siltation, nutrient enrichment, or pesticide inputs.

*Hilsenhoff Biotic Index (*The Hilsenhoff Biotic Index (HBI) reflects the degree of organic pollution and its accompanying effects of decreased oxygen concentrations, increased inorganic nutrient loading, siltation , and altered temperature regime. Higher scores (>7) indicate greater organic loading)

Percent Model Affinity *(Percent Model Affinity* measures the degree of similarity between the benthic macroinvertebrate community at each sampling station to expected invertebrate communities)

Note that the study data indicated that (pg. 9) During storm events all sites except for station 20 and 21 regularly exceed the suspended solids target of 25 mg/L. This is generally in response to runoff carrying silt and solids from contributing areas. Could this happen in the HCBP and would that impact spawning areas?

Trail System location:

The trail system along Tributary A1 north of Laird Rd. places it in close proximity to the cold water portions of the creek and brook trout spawning areas (located in earlier 1994 HCWP. Is this an appropriate location so close to the stream? Note the damage that has occurred to streams in other areas of Guelph located near heavily used trails. Damage is noted to be particularly bad from mountain bikes and dogs.

GUFF to EAC on the Hanlon Creek Business Park April 8th 2009

Guelph Urban Forest Friends would like to thank the EAC board members for your many years of service to this community. Your diligent persistence in voluntarily working through the Hanlon Creek Business Park development plans, for the greater good and future sustainability of Guelph, are much appreciated.

GUFF has particular interest in protection of mature healthy tree cover for Guelph. We are concerned each time healthy trees are removed and would like every effort made to preserve the integrity of the natural systems that sustain trees, soil, water and us.

The sloped fields with their hedgerows of mature diverse species are a host and corridor for the many species that sustain us. Each cherry tree alone can support 448 different types of pollinator insects. Stripping these fields of soil for the massive filling in the lower lands will ruin a natural ecosystem that maintains clean water, and air and species. Why the massive filling? Because this site is not suited to its planned use.

In planning to meet the future with its predicted challenges of more severe storms and droughts, we need all the healthy ecosystems we have. Man made technology cannot replace all natural functions. The stripped slopes with its after-storm runoff can degrade the wetlands when the hedgerows are removed... stormwater management systems often have problems. Technological failures often follow hurricane type storms.

In 2004 a very large parcel of land at the NE corner of Steeles and Mississauga Road was fully graded with hundreds of mature trees removed to make way for a trucking distribution centre. The land was prematurely graded and the local environment compromised. As a result, the land sat unoccupied for years. It was a very ugly site with dust blowing and many unplanned pools of water forming over time. Runoff degraded the local wetland forest and adjoining creek. Once the land was stripped, it lost its capacity to hold the remaining organic matter. It was a tremendous blemish on the landscape that also spurred the loss of much wildlife.

The esthetics of this topography should be key to any plans for this site. Manufacturing jobs are leaving this area. People and business will move here with appreciation of the iconic importance of such a well functioning natural part of our city with its heritage value.

This development plan does not support many of Guelph's Strategic Objectives? For example:
6.1 - "coordinated management of parks, the natural environment and the watershed "

6.6 - "a biodiverse City with the highest tree canopy percentage among comparable municipalities." Since the accepted standard for municipalities is 40% tree cover, and Guelph is now only 25%, we would like the plan to include the protection of most, if not all, of the 1700 mature trees that are designated to be removed from this site.
Since, this proposal is at odds with these important goals, GUFF asks that the committee support changes to the plan that will preserve the hedgerows and trees and limit the mass grading of the site. And we urge the committee to recommend that council provide an opportunity for further public comment at a future council meeting.

Norah Chaloner for Guelph Urban Forest Friends

wellington Waterwatchers.ca

April 8, 2009

The Wellington Water Watchers is a non-profit organization with over 800 members. We are dedicated to the protection, restoration and conservation of drinking water in Guelph and Wellington County. We would like to thank the EAC members for their service to this community for the greater good and future sustainability of Guelph.

The interest of the Water Watchers in the Hanlon Creek Business Park (HCBP) is focused on water issues; in particular the recharge capacity of the Paris Galt Moraine, part of which lies on the site of the HCBP, and the integrity of the Provincially Significant Wetlands on the site. These wetlands, in addition to supporting a diversity of wildlife species, represent pooling or collection sites for the water which recharges the Guelph aquifer. This is important because the City of Guelph draws its drinking water from the Guelph aquifer. While we recognize the need for the City to develop this business park in the interest of securing employment lands and rebalancing the tax base, we have some very specific concerns:

- The Natural Resource Solutions Inc. report (February 2009) on page 128, in the 2nd paragraph, states that the percentage of impervious surface which was modeled in 2004 and approved in the Ontario Municipal Board hearing at 65%, will increase from the 65% to 85%. We are concerned that with 85% of the surface area becoming impervious to water the recharge capacity of that section of the Paris Galt Moraine will be lost.
- The AECOM report (Feb. 2009) implies that the site will be bulldozed and graded in spring or early summer of 2009. There are many hedge rows of trees and some significant old trees that will be lost if this plan proceeds. We are also concerned about the ability of this approach to preserve Provincially Significant Wetlands. Wholesale removal of over 1,000 trees and these wetlands would destroy the integrity of the site's ability to capture and retain rainwater, further diminishing the recharge capacity. We also have concerns regarding the potential negative effects on water quality from the proposed mass grading of the property.
- The TSH Servicing report of November 2004 on page 29 states that eleven of fourteen smaller isolated wetland areas on the site will not be included as Provincially Significant Wetlands and will not be retained. Our understanding of the original plan was that this site was going to retain many small wetland areas and become a showcase of environmentally responsible development. We have simply seen nothing to assure us that the latest principles of Low Impact Development will be applied to this site.

Thank you for considering our comments.

Mark Goldberg
Director
Wellington Water Watchers

Mike Nagy
Director
Wellington Water Watchers

P.O. Box 26036, Guelph ON N1E 6V8

Sierra Club of/du Canada

ONTARIO CHAPTER

To: Guelph Environmental Advisory Committee April 8, 2009

Sierra Club Canada respectfully submits the following comments with respect to the Hanlon Creek Busness Park Environmental Implementation Report:

In the many documents prepared for this site, a recurring theme has been placing an emphasis on preserving the central area of wetlands and woods and that this central area would be "bulked up" in terms of enhancements.

What kinds of things would constitute a "bulking up?" I suggest the following: 1. generous buffers, linkages and corridors; 2. improved connectivity; 3. improving the cold water stream; 4. determining whether the total amount of area preserved clearly demonstrates a successful "bulking up".

1. The first item is generous buffers linkages & corridors to protect both the wetland and provide sufficient habitat to maintain all functions of the wetland. We know from scientific studies that buffers designed to protect all functions of the core wetland need to be about 200 metres to maintain viable amphibian populations. Instead, this plan calls for buffers of 15-30 m that only address runoff & sediment concerns. These narrow buffers also include stormwater ponds, a stormwater pond access road and a ditch for stormwater.

The 2004 Hanlon Creek State of the Watershed study gave the EIS for the Business Park a grade of "poor" for the treatment of type 2 buffers, corridors and linkages. Numerous buffers, linkages and corridors recommended in the Hanlon Creek Watershed Plan from 1993 were reduced in size. Attached is a map showing the protected area in current plan (black outline) vs. what was recommended in 1993 study (shaded area).

The Watershed Study found that "From a planning and zoning perspective, . . .Type 2 lands (i.e. buffers, linkages and corridors) have been subject to significant encroachments . . .Changes have primarily been losses of agricultural lands and cultural meadows intended by the HCWP to be left as naturalized buffers or corridors. This loss has ironically been facilitated by the EIS process whereby the incremental loss of type 2 lands has been overwhelmingly recommended and approved." That is exactly what happened with the HCBP EIS.

EAC raised concerns on May 12, 2004 that narrow buffers that include stormwater services were a concern and that there were not enough enhanced areas to warrant reduced buffers; Guelph Field Naturalists raised the concern of narrowed buffers in their letter of December 13, 2004, GRCA raised the issue of stormwater services in buffers as recently as December, 2008 "Development should not occur in the setback areas." The Committee should also consider that the 1993 study did not contemplate industrial development with 85-90% impervious surfaces in this area. Under such a scenario it is likely much wider buffers would have been recommended.

So I would argue that we cannot consider that the proposed buffers, linkages and corridors support the "bulked up" argument.

2. Another bulking up feature would be improving connectivity within the protected area. As originally conceived, the Laird Road roadbed would be removed. This was cited as key component by EAC on December 8, 2004, a GRCA letter of January 24, 2005 and by GFN in letter of December 13, 2004. However, not only will Laird remain, another road will be added as a barrier across one of the narrowest linkages in the wetland complex. Significant amphibian crossings have been confirmed on the site, yet there are no provisions to provide safe amphibian crossing.

Another component to removing the barriers to connectivity would be to assure that the development blocks to not cut into the central wetland area. You will see that the attached figure shows that block 15 is completely surrounded by core wetland.

I would argue that connectivity of the core wetland has been significantly weakened and that the "bulking up" goal has not been met.

3. Another criterion we could use to assess the success of the "bulking up" plan is to see if it improves the cold water stream. The modeling for protecting the cold water stream contains many assumptions: that 50% proposed riparian cover can be obtained quickly; that all cooling trenches will include shading as part of mitigation strategy (GRCA comment: thermal impacts as a result of stormwater runoff must be mitigated before discharge to the stream); that untested cooling trenches will work as modeled (GRCA comment: there is a general lack of supporting literature and monitoring data within the industry which makes it difficult to confirm the performance of cooling trench designs at the present time); that hot asphalt need not be considered in the modeling effects; that each industrial lot will be 45% impervious, when 85-90% impervious surface is allowed.

Yet, even with all of these optimistic assumptions, the mitigation strategy would, "Taken as a whole . . .perhaps lean toward some improvement under future conditions." (Jan 2009 letter to GRCA) If the mitigation fails, suggested strategies include increasing plantings along the stream, floating vegetated islands in SWM ponds, altering stream habitat to provide refuge for brook trout.

So again, there is no evidence that this plan provides any real net benefit to the cold water stream; and the "bulking up" test fails.

4. Another way to determine whether "bulking up" has occurred is to look at the amount acreage around the wetland that has been preserved and what natural features are being lost. The EIS addendum 3 (p 14) indicated that 132 acres (53.57 ha) would be preserved as natural area and setback. We also know that the PSW is about 85 acres [36 ha] (per 2000 EIS). So that leaves 47 acres (19 ha) protected as buffers and linkages. If you then deduct areas of the buffers devoted to storm water management--the ditches and roads, which take up 1/2 to 1/4 of the 15-30 metre buffers (say an average of 1/3), that reduces the buffer area to 31 acres. (12.5 ha).

Then if you take into account the loss of 33 acres of hedgerows (which provide habitat and linkages) and 6 acres of isolated wetlands (which provide an important habitat type not found in the core wetland) then one is left with a total of -8 acres of buffers and/or enhancements. And this does not even consider the loss of the Paris Moraine on the southern part of this site, which is obviously a significant environmental feature that provides unique ecological benefits.

So we can see that in terms of generous buffers, linkages and corridors; improved connectivity; improving cold water stream; and sufficient acreage to clearly demonstrate a "bulking up" of the core wetland, the proposal fails. This is clearly not a "bulking up" and it is likely that the existing resources will actually be degraded.

What started out as an effort to design a development sensitive to the environment has become a classic example of economic desires trumping environmental protections. Every step of the way environmental protections were sacrificed in order to maximize developable land: the narrow buffers around wetlands and woods, putting services in the buffers, removing the small wetlands, removing hedgerow trees, dismissing safe animal crossings, cutting roads and trenches through woodlands, opting for a culvert rather than a bridge.

The EIR contains assurances that it complies with the PPS because there will be NO impact on the functions of this sensitive ecosystem. The EIR maintains we are actually strengthening it.

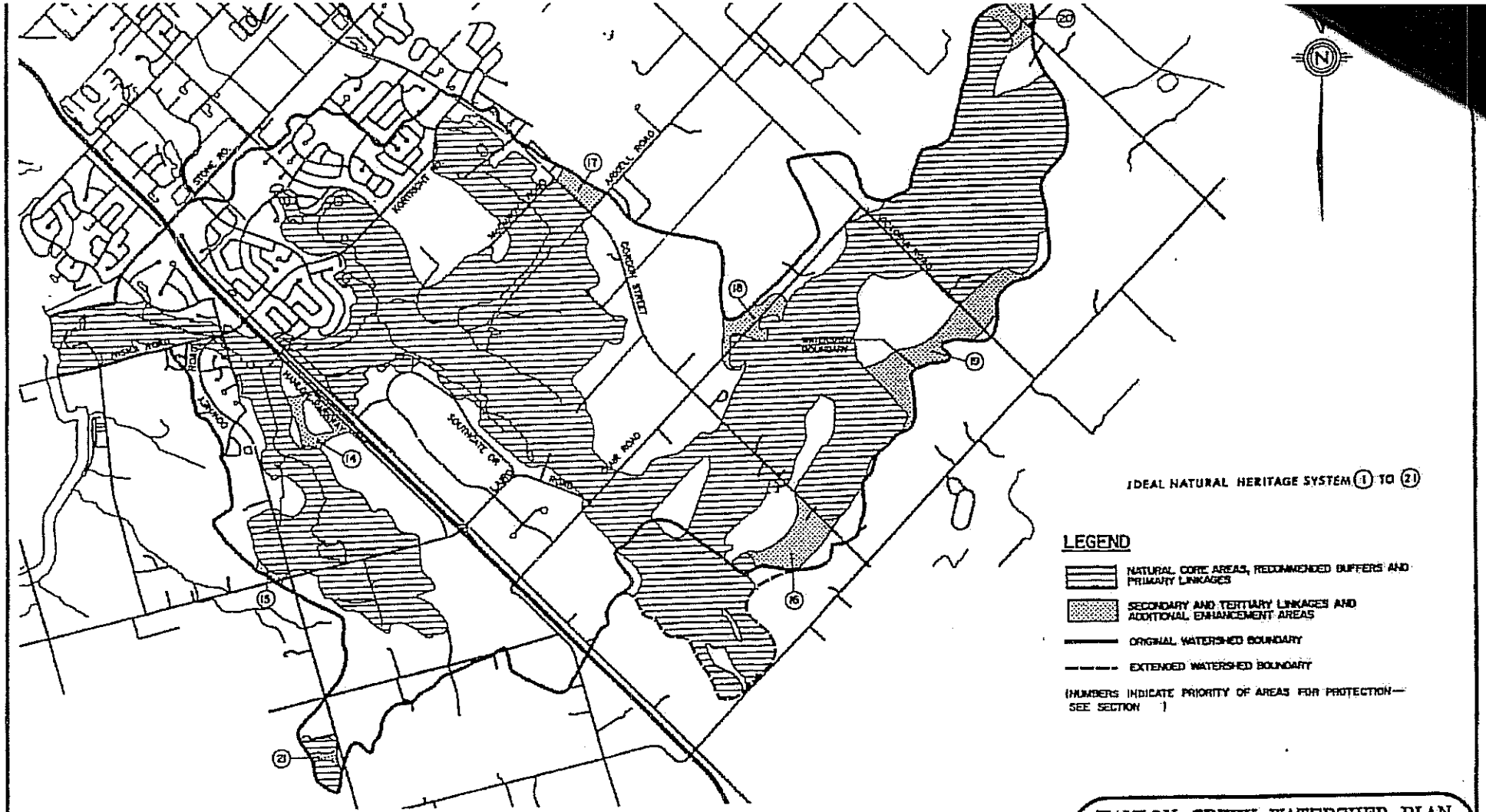
I think any reasonable person will see this as the fallacy that it is. This is, first and foremost, an economic development. It has been building steam over the past several years, without a public discussion at council in 5 years. Derailing a freight train is not an easy thing to do, but it can be justified if it is out of control.

I suggest to you that this development is out of control. As currently drawn, the environmental negatives far outweigh the positives. I urge the committee to reject the EIR on the basis that the current plan fails to meet the test of strengthening the PSW and Tributary A and, in fact, is likely to result in degradation of these valuable resources.

Thank you for the opportunity to comment on this proposal.

Judy Martin,
Regional Representative


= ADDITIONAL AREAS RECOMMENDED FOR PROTECTION IN 1993 HANLON CREEK WATERSHED STUDY
= CENTRAL WETLAND AREA PRESERVED IN CURRENT PLAN
Block 15


IDEAL NATURAL HERITAGE SYSTEM (1) TO (21)
LEGEND
NATURAL CORE AREAS, RECOMMENDED BUFFERS AND PRIMARY LINKAGES
SECONDARY AND TERTIARY LINKAGES AND ADDITIONAL ENHANCEMENT AREAS
ORIGINAL WATERSHED BOUNDARY
EXTENDED WATERSHED BOUNDARY
(NUMBERS INDICATE PRIORITY OF AREAS FOR PROTECTION— SEE SECTION)
SCALE:
0m
500m
1000m
HANLON CREEK WATERSHED PLAN
ALL NATURAL CORE AREAS, BUFFERS, LINKAGES AND ENHANCEMENTS
1491008-01-101
FIGURE 3.4.3
LSL

Comments Re Information Package for HCBP

Hanlon Creek Business Park Environmental Implementation Report
Outstanding Items

Agency and Environmental Group
EIR Comment Table

A general question – will EAC be reviewing these responses?

From Page 1 of 35

1 Q. That no sanitary sewer is routed along the old Laird Road right-of-way

A. Sanitary sewer is required on the portion of old Laird Road That is to remain open (from Hanlon Creek Boulevard to Block 15). No sanitary sewer is proposed on Laird Road West of Block 15.

My question – how will you ensure that the sanitary sewer and trenching will not impact or intercept local groundwater flows?

2. Q. That any watermain routing along old Laird Road be undertaken by tunneling to limit impacts on the wetland and watercourse and that the depth of the watermain should allow for the eventual removal of the road bed.

A. It was proposed to install the watermain crossing of Tributary A using trenchless construction techniques. The use of trenchless techniques and the depth of the watermain for the remainder of the watermain construction on old Laird Road will be reviewed for feasibility and costs with the City Engineering Department prior to tendering.

My question- Does this mean that cost will be the primary consideration in determining whether the trenchless techniques will be used or not? What is more important – the protection of the existing ecosystem or cost?

4 Q. That interim mitigation measures be employed to limit amphibian crossing until the closure of the old Laird Road.

A. NRSI, the City and MNR have worked to develop appropriate interim mitigation measures to limit amphibian movement across Laird Road until closure.

My response- The fence has already blown down in some sections and needs repair. - How do the NRSI biologists expect the amphibians to cross the road in their migrations when there are very few gaps in the fencing? Do they know that the gaps are in the right spots on the road? Where is this fence channeling the migration to? As well I am concerned that the gaps will actually concentrate the numbers of amphibians moving across the road and increase road kill. What has happened to the amphibian tunnels EAC requested?

5 That wildlife/amphibian crossings be considered as part of the design for the new Laird Road in Phase 3.

Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.

When will the design for Phase 3 take place and when will it be built?

From page 3

12 That additional plantings including tree species be provided along the Downey channel to maximize cooling - with input from Union Gas. **Review Comments**

Union Gas requests that no tree or shrub species be planted within the Union Gas easement to allow for maintenance access and avoid potential impact to gas main.

If you can't plant trees or shrubs how will you cool this portion of the stream? Will this portion of the stream receive any stormwater? If you can't cool this portion of the stream how will this impact your modeling of the post development stream temperatures? I.e. will it increase the temperature? Has the modeling been calibrated to take the impact into effect?

14 That retention or creation of habitat connectivity, corridor/linkage from the central wetland/woodland area to the heritage maple grove, and to habitats south of Forestell Road be implemented as part of Phase 3.

A corridor/linkage from the central wetland/woodland to the Heritage Maple Grove and habitats south of Forestell Rd. will be implemented within Phase 3.

Mt question - Has this requirement been added to the TOR for Phase 3?

17 That LID measures be considered at site plan approval stage.

LID measures will be considered at the Site Plan Stage

What is a LID measure? If it is needed is it on the site plan checklist?

19 The watermain installation on Laird Road should

avoid the amphibian breeding season.

Prior to any construction works commencing, it will be recommended that the watermain installation occur outside of the amphibian breeding season.

My question – Has this been tendered yet? When is the amphibian breeding season?

23 Mitigation Measures recommended in the EIR should be employed in the interim to reduce

Barrier fencing, as recommended by NRSI and MNR was installed in November 2009 to ensure mitigation measures are in place for the amphibian breeding season. The City will post wildlife signage along Laird Road to alert motorists of potential crossing locations

My Response – signage will be very ineffective in preventing amphibian mortality. They have no chance against cars and trucks. When the HCBP opens and before Laird Rd. is closed there will be an increase in nighttime traffic especially if businesses are operating 24/7. Currently traffic is less after 7 pm when the gravel trucks are done for the day. Despite less traffic hundreds of amphibians died in the last 2 years. The way to stop the mortality and preserve the species during their migration is to close the road. Will the city consider this interim measure until Laird is closed?

From Page 4

24 Can the new Laird (Phase 3) be designed to accommodate critter crossings at the most southerly end to allow for amphibian and small mammal movement should we secure additional lands for corridor purposed through the site plan process?
Wildlife/amphibian crossings will be considered as part of the design for new Laird Road in Phase 3.

My response – what part of laird Rd. are they talking about? Laird runs east to west – please clarify.

FROM PAGE 5

25 Confirmation is needed regarding the presence of Jefferson Salamanders. Additional monitoring following MNR's established protocol is proposed for this spring. Prior to grading in the immediate vicinity of the Heritage Maple Grove and adjacent to the PSW's, the presence/absence of this species must be confirmed. However, staff are aware that the Draft Recovery strategy indicates that they are likely extirpated from Guelph. Staff have been consulting with MNR and will continue to consult with the Ministry to ensure the proposal conforms with the Endangered Species

Act.

NRSI and the City worked in consultation with MNR staff and Dr. Jim Bogart to finalize a comprehensive salamander monitoring program within the business park for spring 2010 that will determine the presence/absence of Jefferson salamanders in the HCBP

My response – grading has already occurred in the immediate vicinity of the Heritage Grove. Is the MNR aware of this?

27 Can grading activities avoid some of the smaller wetland features during the spring breeding season? Those identified to be removed could be filled in once the breeding season is completed or left to the site plan process where they may be incorporated into the design.

Input from NRSI and City Environmental Planner regarding timing/area restrictions will be written into the tender documents for the grading work.

My response I think PLC ,members should receive copies of all tendering documents in order to ensure that conditions requiring detailed information in the tender are addressed. Will we get copies?

30 Tree protection fencing is identified as Type 2 silt fencing, however, adequate signage around the treed portions of the site (particularly the Heritage Maple Grove) should be provided. Often trees are inadvertently removed as contractors are not aware that the trees are to be protected. Tree protection signage must be erected.

Tree protection signage will be erected prior to grading. Fencing and signage around the Heritage Maple Grove is already in place.

My response; Despite the conditions in the EIR the tree protection fencing around the grove was placed incorrectly within the dripline of the trees and damaged their feeder roots. How will signage protect the trees if the fencing is incorrectly placed and who will be monitoring the fencing? To date as far as I know there has been no cover placed over the exposed roots of the grove trees so follow up after the initial damage has been poor. This does not exactly instill any confidence that further problems will be addressed in a timely fashion. Who will be in charge of making sure everything is done according to the checklist and grading plans? If your answer is the Environmental Site inspector then where was this person when the Grove was being fenced and graded incorrectly?

FROM PAGE 6

31 The current EIR recommends monitoring take Environmental monitoring will continue 2 years after 75% place until 75% build out. Page 91 of the Environmental Impact Study recommends that monitoring take place two years post substantial 80% build-out. In conformance with the EIS recommendations, it would be prudent to monitor

a minimum of two years post 75% build out. The most recent correspondence, March 31, 2009, from AECOM to GRCA indicates that the developer has agreed to two years of post development monitoring following 75% build out. Please ensure this item is identified in the subdivision agreement

Environmental monitoring will continue 2 years after 75% build out of Phase 1, 2, and 3.

My question: The response did not indicate whether the Environmental monitoring will be identified in the subdivision agreement. Please clarify that it is so?

FROM PAGE 7

34 Table 6-9 in the EIR, do not provide adequate details regarding triggers and contingency measures - if monitoring does document some significant changes what kind of adaptive management approaches/tools can be employed? The contingency measures for all monitoring components must be clearly identified in the tables.

NRSI, AECOM and Banks Groundwater will develop a report that will provide details on contingency measures (to be submitted in spring 2010).

My question: Will this report be completed and available for review before the grading and construction of Phases 1 and 2 occurs?

From Page 8

35 Table 6 - Fish Community and Monitoring **Review Comments** Analysis states, "Specific quantitative triggers are not recommended at this time due to the absence of brook trout." This statement does not reflect the finding in the 2008 aquatic monitoring data which indicates that 4 brook trout were captured in Tributary A.

The 4 brook trout captured in 2008 were not captured within the quantitative monitoring stations, but were captured during comprehensive qualitative sampling conducted in an effort to find any individuals of this species. The baseline quantitative sampling demonstrates a general absence of brook trout, making it impossible to observe a change in the numbers of brook trout. Therefore, it is most appropriate to use the water temperature monitoring as a trigger for habitat suitability. A trigger for brook trout can be developed should a population become established and observed at the quantitative monitoring stations.

My response: The fact that brook trout have been found in the HCBP portion of the Trib A since it was 1st studied in the 80's indicates that there is an established population. Maybe you just didn't find them in your earlier studies. Perhaps your stations were in the wrong place? Why is NRS not recommending setting up a quantitative monitoring station where the trout were recently found?? You know they are there so monitor them!

FROM PAGE 11

50 During Laird road mortality surveys conducted by NRSI in spring 2009, a dead eastern milksnake (*Lampropeltis t. triangulum*) was found. The eastern milksnake is listed as a species of Special Concern by COSEWIC and the MNR; however, it is not protected under the Endangered Species Act (2007). The Guelph Natural Heritage Strategy recommends "flag locally significant species observations, but the level and extent of associated habitat protection be determined on a case by case basis with consideration for each species needs."

Milksnake is found within an extremely wide variety of habitats. It does not appear to prefer any particular habitat type; however, it is often found in prairies, meadows, pastures, hayfields, rocky outcrops and a variety of forest types. It is usually found in areas that are close to a water source. Milksnake is listed as a "specially protected species" in schedules of the Fish and Wildlife Conservation Act, 1997. It is forbidden to hunt, trap, kill, trap or hold in captivity any specially protected species without a permit.

My response:

Could you please provide PLC members with a copy of the spring mortality report from NRS > I don't remember getting a copy of this report. What impact will the barrier fencing along Laird Rd. have on the movement of the milksnakes and other snakes across Laird Rd.?

From Pg. 12

51 Based on the status of eastern milksnake and the fact that it is protected under the Species at Risk Act (2007), NRSI recommends that a during construction siting protocol be developed.
This protocol may include education of construction crews on appearance of milksnake and its habitat, relocation of specimen if found during construction and an environmental inspector on-site during construction works to ensure specimens are moved if found (permit will be required from MNR to handle).

My response: Could you pleased supply a copy of this NRSI recommends that a during construction siting protocol? Please explain how practical in situ this protocol will be to implement.? How will construction workers on huge graders be able to see if they are grading areas where there are milksnakes? ? Will there be a construction workers walking in front of the graders looking for snakes trying to escape being crushed? Also snake movements are very dependent on temperatures will the protocol take this into account?

NOTE RE PAGES 12 and 13 re comments and answers to Sierra Club

Has the city provided this document to the Sierra Club, Wellington Water Watchers and GUFF and GFN? If not then they should as they need to see how their concerns have been addressed. They should be given the opportunity to respond to the comments on their issues and questions. If the PLC concurs I would recommend posting these documents including the TOR for phase 3 on the City's HCBP information page on their web site.

FROM PAGE 28

95 Since the grove will be fenced and gated why cut down hazard trees as they do provide habitat. The tallest dead tree in the grove appears to act as a staging area for migratory birds. I observed a large flock of robins (at least 25-40 birds) this last autumn flying in and perching in this tree as I walked along Forestell Rd to gather apples from the road side tree. If the park is gated and fenced the hazard trees could remain as part of the habitat and if a trail is developed only those that post a risk could be selectively cut. Therefore, no trees should be cut until a comprehensive plan is developed and approved.

Hazard trees are a liability risk as the grove may be utilized by pedestrians. The City of Guelph will take ownership of the grove; therefore, retaining hazard trees will be a liability. Also, from a liability perspective, as certified arborists, it is mandatory that hazard trees be identified and recommended for removal.

My response: A stewardship and park plan should be created before any trees are removed. Whether trees are deemed a hazard or not is partially dependant on whether there are any targets in the immediate areas of the threes. Cutting would remove some of the oldest heritage trees. Some of these trees might be saved by cabling and other established methods of heritage trees preservation. These avenues should be explored before any trees are logged. Until there is a plan for the park I would oppose any tree removal. Please indicate if there are any plans to cut down trees in the near future before a plan is developed for the park.

From Site Plan Checklist:

Under Sediment and Erosion Control

1. Please identify what native seed mix will be used on the graded areas after 30 days.

2. "Trees and other areas of vegetation to be retained are identified and delineated with temporary fencing located beyond the dripline to ensure that vehicle movement or material storage does not disrupt vegetation (especially root zones)."

Please add the requirement in the EIR for the minimum distance for fencing. Was it 1 meter or more beyond the drip line? I can't recall.

Snow Storage
Snow storage areas designated in a location at least 30m from wetland

features and 10m from woodlot areas. Storage areas take into account the natural features and functions described in the Consolidated EIS and EIR.

My response- The locations should be changed for woodlands - snow storage areas should also be at least 30 meters from the woodlands as well since the trees and wildlife could be negatively impacted from runoff. Also many of the swales run along the woodland edges. No contaminated runoff from snow should be directed into the swales since it is contaminated with salt, sediment (which will clog the SWM's) and VOC's.

Under Maintenance and Refueling Areas
Maintenance and refueling areas located away from natural features on-site (minimum 30m from wetland areas and 10m from woodlot edge).
Site specific location designated at Site Plan stage.
Minor grading to direct surface runoff from natural features if maintenance and Refueling areas located in proximity of natural features (i.e. 30m

My question: shouldn't any refueling areas be located away from drainage swales too since these carry water to the SWM's?

Laird Road
Installation of subsurface utilities prepared and reviewed by a qualified ecologist or biologist for potential impacts to neighbouring wetlands and watercourses.
Using trench technology for installation of subsurface utilities so no direct disruption of vegetation.
Sediment and erosion control measures implemented and maintained throughout construction period.
Restoration plans recommended in HCBP Phase 3 EIR/Tender package implemented upon closure of Laird Road

My question – where is the reference to no construction activity during spring amphibian migration. Etc. If it is not placed here where will it be given to the builders?

Subsurface Watermains and Sewers
Use of granular backfill for subsurface pipes to create a conduit for groundwater flows.
All subsurface pipes installed in areas of high groundwater levels include cutoff collars to prevent impacts to groundwater flow patterns.

My question: Since groundwater levels are high over much of Phase and parts of phase 2 and 3 wouldn't it be more proactive and prudent to require cut off collars on all of the subsurface pipes??

Management guidelines for Heritage Maple Grove as per the City of Guelph:
- Identify hazard trees within the grove inspected by a qualified City staff person or designated Certified Arborist, to determine the need for hazard tree management (pruning, removal etc.).
- City has prepared and implemented an invasive species removal program (especially for common buckthorn (*Rhamnus cathartica*).
- Heavy-duty paige wire fence installed around perimeter of Heritage Maple Grove to provide additional protection.

My question – why is this in the checklist? Shouldn't there be a park plan 1sy before trees are logged?? I would like to see a copy of the proposed invasive species removal plan please as well as a list of trees proposed to be logged.

General Comment- maybe I missed it but I could not find a reference to construction of the berms? Will they already be in place at the site approval stage?

FROM Suzanne Young's Correspondence:

I could not find any reference in the NRS's response re the "*Monitoring of mitigation measures for the thermal regime (reserve fund available to retrofit and address potential changes in temperature" Will* a reserve fund be set up? If not who will pay to mitigate?

Also *"Design and functionality of bottom draw"*
"Soil mix for SWM Plantings"
Confirmation of trails materials
Where has this been addressed?

Please explain where the answers to the following are as I could not find them:

1. Accuracy of Pre-Construction Bird Monitoring
The FBMP (Forest Bird Monitoring) in 2006 and 2008 was done incorrectly. The timing windows for FBMP are one survey between May 24 - June 17 and a second survey between June 13 - July 10th. This split in the monitoring is in order to survey early breeders. The first survey in 2006 and 2008 was June 20th, after the window for early breeders. In addition the vegetation monitoring plot (1x1m's) should be done in two seasons, spring for the spring ephemerals and early plants and in the late summer or fall for the later blooming species, especially in a wetland. The monitoring done in 2007 was completed June 5, 6 and 14th. The vegetation monitoring should be done within a week of the original surveys replicated each year, making them comparable. I don't think you could actually compare this information year to year, making the monitoring program ineffective.

2 . Tree replacement policy/program
I understand from the restoration plans that the larger trees and shrubs planted will be on a 2yr warranty based on survival. If they die after 2 years then they are replaced? Can this be changed to being based on growth? Can an assessment be done on the appropriateness of the species to the site? Perhaps the site was wetter or became wetter over two years than anticipated and the species planted is now not appropriate for that location and should be replaced with something else not the same species over and over again. If the replacement is based on growth, then trees that are not healthy and may die in year 3 could also be replaced in year 2.

3 . Restoration plans
The planting contract should be a sub-contract to a native restoration or planting company. Not a construction company. I have encountered other developments were the plants put in the ground were purchased from a nursery and were not actually a native species but a hybrid. This resulted from inexperienced nursery staff supplying the materials and no checks being made after the fact. In addition nursery has been known to make substitutions for species when they are out of stock of the native one. This should also be discouraged

With respect to the recharge, water temperature modeling, SWM design and hydrology, hydrogeology letters and reports. I believe that the city staff and agency letters and reports

contained in the information package should be sent to Dr. Hugh Whiteley for review as he is an expert and as such was instrumental in the development of these items during the OMB and for the OMB Settlement.

Consolidated Monitoring Program

Hanlon Creek Business Park
Consolidated Monitoring Program

Prepared for:

City of Guelph
Economic Development & Tourism Services
City Hall, 1 Carden Street
Guelph, Ontario

Project No. 726

Date: August 2010

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Hanlon Creek Business Park
Consolidated Monitoring Program

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Report submitted on August 11, 2010

A Schiedel

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1.0 Introduction

The monitoring program associated with the Hanlon Creek Business Park (HCBP) is an integration of a series of monitoring requirements arising from recommendations made in the Consolidated EIS (NRSI 2004), the Draft Plan Conditions (OMB 2006), and review comments from agencies during the various stages of the planning process. A consolidation of the monitoring on the HCBP Lands is required as a condition of approval of the *HCBP Environmental Implementation Report 2009* (EIR) prepared by Natural Resource Solutions Inc (NRSI). The City of Guelph Environmental Advisory Committee (EAC) recommended approval of the EIR, with a list of conditions that should be met prior to registration of the plans for Phases 1 and 2. Condition 8 states:

> *That a comprehensive and consolidated monitoring program, which specifies frequency, location, protocols, timing, thresholds, and specific contingency measures be submitted and approved by the City of Guelph and the GRCA.*

To meet the above condition, this report has been created as a reference document containing the standards that are to be followed in carrying out the Consolidated Monitoring Program. The components, reporting structure, and schedule provide a framework for the consolidated nature of the program. The Standard Operating Procedures provide detailed methodologies such that each component of the performance monitoring can be carried out consistently over the many years of monitoring that will occur. **This monitoring program covers all three of the Business Park phases.** The phases are shown in the Draft Plan of Subdivision, provided in Appendix I.

Natural Resource Solutions Inc. prepared this report in conjunction with Banks Groundwater Engineering Limited (hydrogeology), and AECOM (surface water).

2.0 Background

In 1993, The City of Guelph annexed 1,489 ha of land along its southern boundary with the Township of Puslinch. A portion of this land was then designated by the City as Corporate Business Park and Industrial lands (called the 'Hanlon Creek Business Park'). The study area for this project is comprised of the lands between Downey Road and the Hanlon Expressway, and between Forestell Road and the south end of the Kortright subdivision along Teal Drive. The lands fall within Part Lots 16, 17, 18, 19, and 20 Concession 4 and Part Lots 16, 17, 18 and 19 Concession 5 in the former Geographic Township of Puslinch (now the City of Guelph). At the time of writing, lands within Phases 1 and 2 are a mix of agricultural fields, meadow, woodland, forest and Provincially Significant Wetlands consisting of swamp, marsh and thicket, while Phase 3 is primarily agricultural field and cultural meadow, with small wetlands. The core area of natural features has been designated as natural heritage lands to be retained in their current state. The agricultural fields and associated hedgerows, and small isolated habitats have been designated for roads and development blocks.

The creek, wetlands and forested uplands in the HCBP are part of the much larger Hanlon Creek watershed. The central wetlands in the HCBP are part of the Hanlon Swamp Wetland Complex and therefore are considered provincially significant. In addition, a small wetland in the southwestern portion of the HCBP, next to Downey Road, is part of the provincially significant Speed River Wetland Complex.

This area encompasses a headwater tributary of Hanlon Creek. The tributary within the HCBP was designated as Tributary A in the Hanlon Creek Watershed Study (Marshall Macklin Monaghan Limited 1993). All of Hanlon Creek is designated as a cold-water stream to be managed for brook trout (GRCA and MNR 1998).

3.0 Monitoring Components

As noted above, the monitoring program associated with the HCBP is an integration of a series of monitoring requirements arising from recommendations made in the Consolidated EIS (NRSI 2004), the Draft Plan Conditions (OMB 2006), and review comments from agencies during the various stages of the planning process. There is also a need to monitor the effectiveness of measures arising from the detailed studies and EIR as part of the design, mitigation and restoration of features in the Business Park.

A total of 7 discrete monitoring requirements have been identified. They are:

1. **Performance of Stormwater Management Systems:** Monitoring of hydrogeology, creek flows and temperatures, aquatic biota and wetlands, arising from the Draft Plan Condition #12 to provide baseline information on interactions and as input to the design of stormwater management facilities that discharge to Tributary A, as well as post construction monitoring of performance of the ponds (especially thermal impacts).
2. **Groundwater and Wetlands for the HCBP:** Monitoring arising from the Draft Plan Condition #12 of hydrogeology and wetlands at strategic locations to provide baseline information on spatial distribution and interactions of groundwater/wetlands such that block-level infiltration targets can be assessed.
3. **Groundwater and Wetlands for the Mast-Snyder Gravel Pit:** Monitoring of hydrogeology and wetlands in the western portion of lands south of Laird Road (Speed River PSW) to monitor changes in groundwater and wetlands stemming from concerns over potential impacts of the proposed neighbouring Mast-Snyder Gravel Pit.
4. **Permit Conditions and EIR Recommendations:** Monitoring arising as conditions from permit applications/review as well as impact predictions specifically arising from recommendations out of the EIR process. Permit-related monitoring includes monitoring of instream construction activities as per the *Fisheries Act* permitting process (part of the GRCA permit), and the monitoring requirements set forth in the Certificate of Approval from the Ontario Ministry of the Environment for the stormwater management facilities.

5. **Success and Naturalization of Restoration Areas:** Monitoring of success and naturalization processes of restoration areas within buffers, swales and stormwater management areas, arising from agency comments and restoration planting warranty.
6. **Wildlife Movement:** Monitoring of wildlife movement throughout the Business Park, with a focus on movement and mortality associated with Laird Road and Hanlon Creek Boulevard (Road 'A').
7. **Construction Monitoring:** Monitoring arising from the Draft Plan Condition #10, which states that an environmental inspector is to carry out the construction monitoring during grading, servicing, and building construction.

There are 8 performance monitoring components and 2 construction monitoring components that will occur on the HCBP property, and they are being conducted to serve one or more of the requirements listed above. Pre-construction monitoring occurred over a number of years to establish baseline conditions. Most of the monitoring activities were in effect annually from 2006 to 2009. Some construction inspection occurred in 2009 associated with the Road 'A' culvert, directional service installation under the Hanlon Expressway, and borrow pit operations in the southeast corner of the Business Park.

3.1 Performance Monitoring

The performance monitoring components are indicated as follows, with the years of pre-construction monitoring indicated in parentheses.

- Groundwater (most years from 1999 to 2009)
- Stream Temperature and Flow (annually from 2006 to 2009)
- Fish (annually from 2006 to 2009)
- Benthic Invertebrates (annually from 2006 to 2009)
- Vegetation and Soils (annually from 2006 to 2009)
- Breeding Birds (annually from 2006 to 2009)
- Amphibians (annually from 2006 to 2009)
- Salamanders (2009)

The performance monitoring is to be conducted by the City of Guelph – as the developer group representative. The duration of the responsibility to monitor has been defined in Condition 10 of the City of Guelph EAC recommendation for approval as the time when 75% of Phases 1, 2 and 3 of the business park have been built, plus an additional 2 years. The monitoring program applies to this commitment by the City of Guelph as the developer representative. Once the developer's responsibilities are fulfilled, it is typically the municipality that assumes responsibility for any continued monitoring.

To assist with the determination of what future/ongoing monitoring may be required after this timeframe has elapsed, the Consolidated Monitoring Program includes an annual review of future monitoring needs, which includes possible modification of approach or even cessation of components.

Standard Operating Procedures for the components of the performance monitoring are provided in Section 6.0 of this document. Each monitoring discipline is responsible for recommending changes in the frequency, intensity or duration of monitoring as the need arises. Such recommendations are to be included in the annual reporting.

3.2 Construction Monitoring

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits, including permit(s) from the GRCA under Ontario Regulation 150/06 and the Letter of Advice from GRCA that constitutes approval under Section 35 of the *Fisheries Act*. Construction monitoring also serves as a means to avoid contravention of other regulations, such as Section 36 of the federal *Fisheries Act* pertaining to deleterious substances. In the specific case of the HCBP, the need for construction monitoring also stems from Condition 10 from the Ontario Municipal Board hearing for the HCBP Draft Plan (June 2006). The condition states that an environmental inspector is to carry out the construction monitoring during grading, servicing, and building construction. Condition 10 is stated as follows:

> That the Developer shall provide a qualified **environmental inspector**, satisfactory to the Director of Planning and Development Services, to inspect the site during all phases of development and construction including grading, servicing and building construction. The environmental inspector shall monitor and inspect the erosion and sediment control measures and procedures, compliance with the Environmental Impact Study and the Environmental Implementation Report on a weekly or more frequent basis if required. The environmental inspector shall report on their findings to the City on a monthly or more frequent basis.

Due to the site-specific requirements and dynamic nature of construction monitoring, standard operation procedures for construction monitoring are not provided in this monitoring plan. However, guidance can be obtained from commonly cited documents on the subject. At the time of developing this monitoring program, the *Erosion and Sediment Control Guideline for Urban Construction* prepared by the Greater Toronto Area Conservation Authorities (2006) is a commonly cited document in the Greater Toronto Area of Ontario.

The relationships between the monitoring requirements and components are outlined below in Table 1.

Table 1. Monitoring Requirements and Components

	Performance Monitoring								Construction Monitoring	
	Ground-water	Stream and Pond Temperature, Flow and Water Quality	Fish	Benthic Invertebrates	Vegetation and Soils	Breeding Birds	Amphibians	Salamanders	Construction Inspections	Performance of Plantings
1. Performance of Stormwater Management Systems	X	X	X	X						
2. Groundwater and Wetlands for the HCBP	X				X		X	X		
3. Groundwater and Wetlands for the Mast-Snyder Gravel Pit	X				X		X	X		
4. Permit Conditions and EIR Recommendations	X	X	X	X	X			X	X	
5. Success and Naturalization of Restoration Areas					X	X	X	X		X
6. Wildlife Movement					X	X	X	X		
7. Construction Monitoring	To be conducted during grading, servicing and building construction, concerning all natural features on the site.									

4.0 Reporting Structure

To date preconstruction monitoring has been reported in individual reports covering each professional discipline. These reports were appended to the EIR and include aquatic monitoring reports, terrestrial and wetland monitoring reports, a stream flow and temperature monitoring report, and hydrogeological monitoring report. Refer to Section 7.1 for a complete list of available reports.

Future reporting will consist of annual Consolidated Monitoring Reports, Construction Monitoring Reports, and a Rapid Assessment and Action Protocol (RAAP) for responding to threshold exceedances or other observations of concern. The first Consolidated Monitoring Report is to be produced for the 2009 monitoring year, and construction monitoring will occur in conjunction with construction activities. The RAAP will be in place for the commencement of construction anticipated sometime in the year 2010.

4.1 Consolidated Monitoring Report

An annual consolidated reporting process will facilitate effective monitoring by integrating all of the monitoring data and addressing all trends and effects that are identified. Integration will provide each monitoring discipline with the opportunity to make use of the findings of the other disciplines and provide accessible documentation for stakeholders. Trends and effects can be addressed in a manner that recognizes the need for input from multiple disciplines. The reporting process will culminate in the production of an annual Consolidated Monitoring Report, which includes 8 specific components:

1. A **Summary of Findings** of each monitoring discipline provides the reader with a synopsis of all the information and highlights any substantive changes in the methodologies.

2. **Individual Reports** from the past year for each discipline are appended to provide the reader with opportunity for more detailed review, to facilitate referencing in the main body of the report, and to file all monitoring information together by year.

3. **Construction Inspection Reports** are appended to ensure they are filed with the other monitoring data, and to facilitate referencing as needed in the main body of the report.

4. **Reporting on Effects** from the past year stemming from threshold exceedances or observations of concern (if any) is appended and summarized.

5. **Trends and Effects** (either positive or negative) are identified and addressed in detail. All known causes related to each trend or effect are included in the discussion. The discussion is based on all applicable annual monitoring data, and can also make use of construction inspection reports and/or effects reporting.

6. **Recommended Actions** are provided to deal with negative trends or effects. These actions need not include detailed plans of corrective measures because this could delay the production of the reporting. Rather, they initiate action to deal with negative trends, and/or reiterate ongoing or planned actions stemming from the Rapid Assessment and Action Protocol (see Section 4.3). They should also indicate the severity of the issue and provide a timeframe for action.

7. **Corrective Measures** that have taken place in the previous year are documented. The associated discussion clearly indicates whether the recommendation has been implemented and the situation corrected. As part of this documentation, a table or chart is included that provides a rudimentary history of recommendations and actions to show what issues remain outstanding, and to provide the reader with a history of recurring issues.

8. **A review of future monitoring needs** will summarize recommendations from the individual reports, and provide any clarification required to ensure continued coordination of the monitoring disciplines.

The schedule for the production of the Consolidated Monitoring Report must provide opportunity for the disciplines to have access to all reporting of each individual discipline.

It must also ensure that the Consolidated Monitoring Report can be produced in a relevant timeframe. To these ends, there are 3 annual deadlines for reporting of data collected in the calendar year.

February 15 – Reports for each monitoring discipline are circulated to the monitoring team. These reports include all data and findings, but discussion is limited to interpretation of data. Electronic format is sufficient.

February 28 – Final discipline reports are provided to the author of the consolidated report. They include discussion that integrates data from other reports as necessary to interpret the findings, discuss impacts, and make recommendations that can be brought forward into the consolidated report. Electronic format is sufficient.

March – The consolidated report is produced as early as possible in the month of March, no later than March 31. It is provided to the City of Guelph as the regulator in electronic and hard copy formats as follows.

- One electronic and one hard copy to City of Guelph Engineering Services
- One electronic and one hard copy to City of Guelph Community Design and Development Services

This reporting process is the responsibility of the City of Guelph as the developer group representative for the duration of the responsibility to monitor. This is defined in Condition 10 of the City of Guelph EAC recommendation for approval as the time when 75% of Phases 1, 2 and 3 of the business park have been built, plus an additional 2 years.

Monitoring is also taking place on lands approved for the proposed Mast-Snyder Gravel Pit located to the west of the Hanlon Creek Business Park. In the course of the OMB hearing for the gravel pit, there was debate on whether the operations at the Mast-Snyder Gravel Pit would affect groundwater on the HCBP site. Effects on groundwater could in turn affect the wetlands and creeks on the HCBP site. In light of this, the monitoring data from the Mast-Snyder Gravel Pit is a very important tool for interpreting the results of the monitoring on the HCBP site, and vice-versa. These data should be

utilized as needed in the annual Consolidated Monitoring Report, once gravel extraction operations commence. The exchange of monitoring data was agreed to as one of the conditions arising from the OMB hearing as described in minutes of settlement.

4.2 Data Management

A consolidated data management model is to be established and maintained. It should include all environmental monitoring data in one central electronic database, including all relevant background data collected from the site and any new data collected during the previous monitoring period. The electronic database is to be submitted to the City's Engineering Services department as an attachment to the Consolidated Annual Monitoring Report due each year by the end of March.

4.3 Construction Monitoring Reports

Whenever construction activity is ongoing, environmental inspections are to occur weekly as per OMB Condition 10 (quoted above in Section 3.2 of this document). OMB Condition 10 also specifies that construction monitoring reports are to be submitted to the City of Guelph once per month or more frequently, and this reporting practice must be followed. The details of reporting frequency will be site-specific and determined as part of the permits, or as deemed appropriate by the environmental inspector/monitor.

4.4 Rapid Assessment and Action Protocol

The construction inspection/monitoring is conducted on a project-specific basis and is typically based on rapid response to any environmental issues that arise as a result of the construction. On the other hand, the performance monitoring is conducted throughout the Business Park, but may only be reported on at the end of the annual period. As such, there is the need to identify a protocol to quickly address environmental issues that become evident through the course of the annual monitoring. This protocol is provided to facilitate rapid response to events when specific thresholds are exceeded or when other unexpected environmental issues arise.

The specific thresholds that require rapid response are the 22°C and 24°C stream temperature thresholds, and the turbidity threshold. These are detailed in Section 6.0.

The thresholds for the long-term biological monitoring (fish, benthic invertebrates, vegetation and soils, breeding birds, and amphibians) need not be dealt with in the Rapid Assessment and Action Protocol (RAAP) timeframe, as these results are more appropriately dealt with in the annual reporting. However, the RAAP may be used for any monitoring components should a monitoring team member have a concern about the results that they think should be addressed promptly. Groundwater monitoring results are treated similarly. No specific groundwater thresholds are recommended and the groundwater results are generally reported annually, but unexpected changes in the results are treated as an observation of concern that is subject to the RAAP. The temperature and turbidity thresholds are emphasized because they are instream measurements of water quality parameters that have a direct impact on brook trout (*Salvelinus fontinalis*).

Rapid response is required should stream temperatures become unsuitable for brook trout due to the sensitivity of brook trout to increased stream temperatures and sedimentation. The Grand River Fisheries Management Plan indicates that Tributary A of Hanlon Creek is to be managed as coldwater habitat for brook trout (GRCA and MNR 1998). In addition, rapid response is required to address failure of erosion and sediment controls in the vicinity of the creek, or events of sediment entering the watercourse because of the potential for deposition of fine materials to impact brook trout habitat.

Monitoring staff, the contractor or the general public may also have observations of concern that warrant immediate attention.

The central component of the RAAP is the designation of 3 persons representing the City of Guelph, the Grand River Conservation Authority, and the Monitoring Team. These designated persons are responsible for overseeing the RAAP. This group of designated persons must be confirmed on a yearly basis or when otherwise warranted (in the event of a staff change, for example).

The Monitoring Team constitutes the collective consulting firms who are acting on behalf of the City to perform the various monitoring disciplines. The Monitoring Team members are responsible for reviewing their data for threshold exceedances or other observations

of concern. If a member of the Monitoring Team identifies either of these, they must initiate the RAAP by contacting one of the Designated Persons. This must be done immediately so the threshold exceedances or observations of concern can be addressed within 2 days of acquiring the information. Threshold exceedances and examples of observations of concern are provided with the Standard Operating Procedures in Section 6.0.

Construction monitoring is included as a monitoring discipline within the Monitoring Team. However, it must be recognized that observations of concern has a somewhat different meaning for construction monitoring. Observations of concern for construction monitoring represent concerns that are not addressed promptly and effectively. Administration of construction mitigation measures is a dynamic process in which there is frequent discussion and reporting. It is a routine occurrence for the construction inspector to make recommendations to the contractor or contract administrator for improvements to mitigation measures such as erosion and sediment controls. If corrective measures are employed promptly and effectively, it is not necessary to consider this process to be an observation of concern. If corrective measures are not carried out to the satisfaction of the construction inspector and the issue cannot be resolved, the RAAP represents a broader level of response to the concern. If initiated, the RAAP is not intended to replace the regular reporting by the construction monitor. Rather, it is carried out in addition to the regular reporting.

The RAAP is carried out as follows:

1. The monitoring team member who discovers the exceedance or observation of concern must contact one of the Designated Persons immediately. In the case where a third party identifies a possible issue, the issue should be reported to one of the Designated Persons.

2. The Designated Persons must meet and investigate the cause of the exceedance and the potential impacts within 48 hours of notification by the Monitoring Team member. This meeting need not be limited to the Designated Persons.

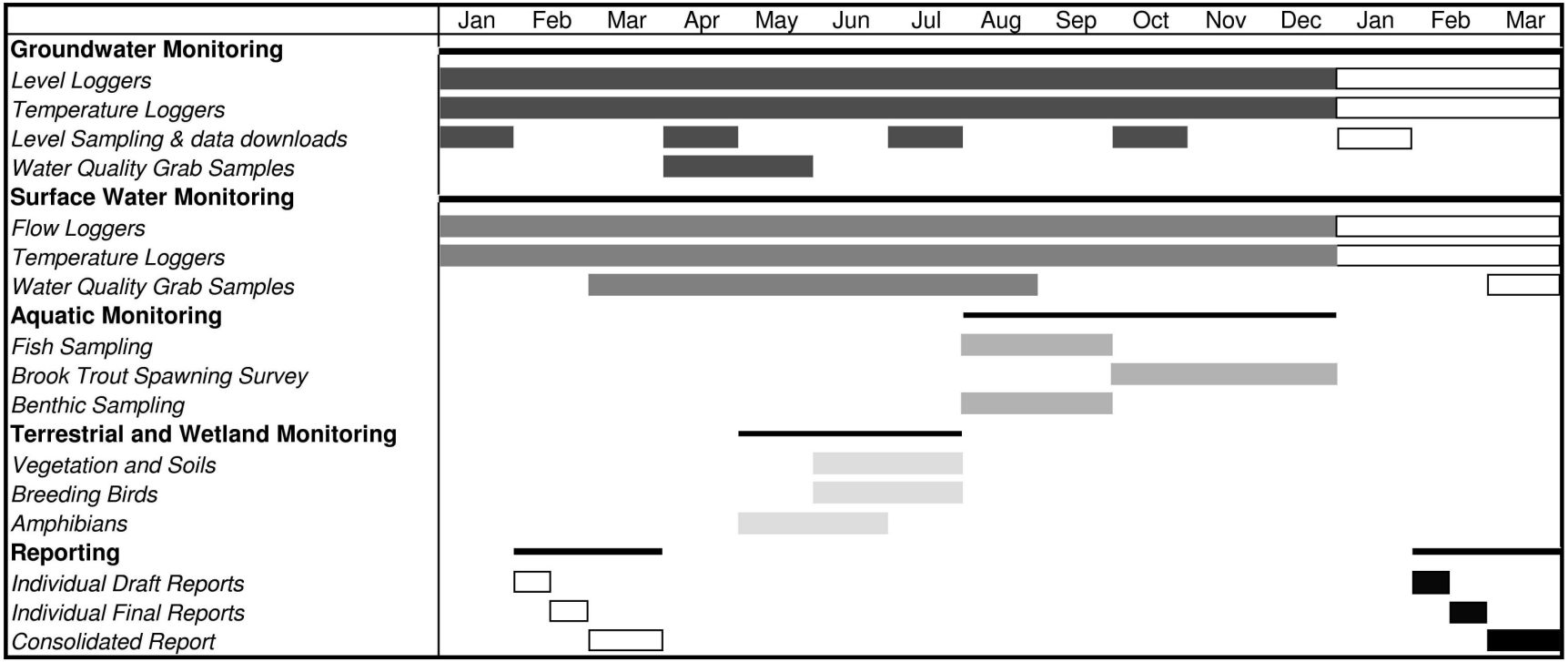
3. The Designated Persons must provide notification of the exceedance and proposed corrective actions including the timeline for implementation to the City and GRCA within three business days.

4. A minimum of 1 report per concern must be prepared for each calendar year in which activities related to the concern occur. The report(s) document the nature of each problem and how it is being addressed. The format could be meeting minutes, a letter or memo report, or a formal report. Regardless of the number or type of reports, the last report must indicate how the problem was resolved.

5. Threshold exceedances and observations of concern must be documented in the Consolidated Monitoring Report for the year in which they occur. As part of this, any RAAP reporting that occurs pursuant to item 4 of the RAAP must be appended to and summarized in the Consolidated Monitoring Report for the year in which the RAAP reporting occurred.

The RAAP is the responsibility of the City of Guelph as the developer representative for the duration of the responsibility to monitor. This is defined as the time when 75% of Phases 1, 2 and 3 of the business park have been built, plus an additional 2 years.

5.0 Annual Schedule of Activities



6.0 Standard Operating Procedures

6.1 Groundwater

GROUNDWATER

Purpose:

Groundwater monitoring is associated with 4 of the monitoring requirements for the HCBP:

1. To evaluate the performance of the stormwater management system for the HCBP as it pertains to the aquatic habitat in Tributary A.
2. To detect any effects on the groundwater and wetlands on the HCBP property that is attributable to the HCBP. The predevelopment monitoring also provides baseline information on spatial distribution and interactions of groundwater/wetlands such that block-level infiltration targets can be assessed.
3. To detect any effects on the groundwater and wetlands on the HCBP property that is attributable to the neighbouring Mast-Snyder Gravel Pit. This entails monitoring of hydrogeology and wetlands in the western portion of lands south of Laird Road (Downey Road PSW).
4. Monitoring arising as conditions from permit applications/review as well as impact predictions specifically arising from recommendations out of the EIR process.

Methods:

The established program includes monitoring of groundwater levels in selected monitoring wells and mini-piezometers. Groundwater quality samples are collected from selected monitoring wells.

Groundwater levels are measured using industry-standard electronic water level meters. Measurements are made of the depth to groundwater from the top of the monitoring well or mini-piezometer casing and recorded with an accuracy of 1.0 cm. Groundwater elevations are calculated from the elevation of the top of monitoring well or mini-piezometer casing. The depth to groundwater below ground surface is also calculated from the difference of the top of casing elevation and the ground surface elevation at the monitoring location. Groundwater elevations and depths to groundwater for each monitoring location are recorded in the monitoring dataset following each monitoring period.

Groundwater levels and temperature are also recorded in selected monitoring wells and mini-piezometers by utilizing data loggers. Groundwater elevations are calculated from the depth measured below top of casing and corrected for barometric pressure influences, and calibrated relative to manual measurements. By utilizing this technology, the frequency of monitoring can be increased significantly and trends in groundwater level changes can be detected sooner and with improved accuracy. These groundwater elevation data are recorded in the monitoring dataset following each occasion when the data is downloaded from the data loggers.

GROUNDWATER

Groundwater samples are collected using Waterra© sampling systems. These systems are to be dedicated to each of the selected monitoring wells and are to remain installed for subsequent monitoring. Samples are collected and contained in sample bottles provided by an accredited laboratory. Chain-of-custody protocol, quality assurance and quality control methods are to be established in consultation with the laboratory.

Samples are analyzed for general chemical water quality indicators, which currently include various Anion, Metal, and Wet-Chemistry parameters. Anions include Chloride, Fluoride, Nitrate (as N), Nitrite (as N), Phosphate-P (ortho), and Sulphate. Metals include Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Phosphorus, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, and Zinc. Wet chemistry includes Alkalinity (CaCO3), Bicarbonate (CaCO3), Carbonate (CaCO3), Colour, (TCU), Total Organic Carbon, DOC, Hardness (CaCO3), Total Dissolved Solids, Ammonia (as N), Conductivity, pH, and Turbidity. Calculated values include Anion sum, Cation sum, % Difference, Langelier Index, Saturation pH, and Silica.

Additional groundwater quality parameters may be selected on the basis of the results of previous sampling and analysis, and in relation to the types of industries located within the HCBP.

Location:

The 35 functioning monitoring wells and 12 mini-piezometers located across the HCBP site currently provide adequate groundwater monitoring locations. Of the 35 current monitoring wells, those currently equipped with data loggers include 001, 003, 004, 005I, 006, 104, 105, 106, 107, 109, 110, 116A, 117A, 118A, 119A, 121A, and 122A. Mini-piezometers currently equipped with data loggers currently include 1D, 2D, 4D, 7D, and 9D. Water quality samples are currently taken from 33 of the monitoring wells.

Prior to any site grading, the grading schedule should be reviewed to determine the potential for monitoring locations to be affected. Any monitoring stations located within the planned grading areas must be properly abandoned, in advance of grading, in accordance with Ontario Regulation 903, as recently amended, of the Ontario Water Resources Act, by a licensed Water Well Technician.

During construction and for the remainder of the monitoring program, groundwater level and quality monitoring should continue at the current stations to the extent possible. Most existing monitoring wells can be maintained, with minor modifications or improvements, for continued monitoring. Several wells must be replaced following grading and development of selected blocks (Figure 1).

Frequency:

Groundwater level monitoring occurs on a seasonal basis to establish variations in groundwater levels for each season at each station. In selected monitors, groundwater levels and temperature are recorded on a daily, or more frequent, basis using data loggers to assist in determining the relationships of groundwater levels, wetland levels, surface water flow, and precipitation.

GROUNDWATER
Groundwater quality samples are collected on an annual basis.
Timing: To correspond to previous monitoring, the preferred groundwater level monitoring periods are January, April, July and October, and groundwater quality samples are collected in April or May.
Thresholds and Observations of Concern: A specific quantitative threshold is not used. However, unexpected changes in groundwater elevations or quality require certain contingency measures. Groundwater elevations that increase above previously observed seasonal high levels or decline below previously observed seasonal low levels, without an obvious relationship to precipitation, will be identified as observations of concern. Similarly, groundwater quality that differs from previous ranges in parameters, and/or indicates an upward trend, will be identified as observations of concern.
Contingency Measures: In response to any unexpected changes, the frequency of monitoring, sampling, and reporting is to be evaluated and revised as required. Possible cause and effect relationships will be identified and recommendations to further evaluate these relationships will be made. As an example, in the case of declining groundwater levels observed at a monitoring location, it would be recommended that the local lot-level stormwater management systems be assessed in terms of groundwater recharge performance criteria and targets. If this is determined to be the cause, possible modifications would be identified and recommended.
Reporting: Following each seasonal monitoring period, the data is recorded and entered into the groundwater level monitoring dataset. Data downloaded from each data logger is corrected for barometric pressure and then incorporated into the respective records within the groundwater level monitoring dataset. As the dataset is updated, tables, graphs and figures are also updated to support on-going analysis of the groundwater monitoring results. The monitoring data is compiled, plotted, and analyzed on an annual basis by a qualified professional engineer or geoscientist. A Technical Memorandum is provided on an annual basis, for the purpose of review, acceptance, and response to recommendations. Recommendations related to the monitoring program, including any proposed modifications, would be included. The GRCA also receives a copy for review and comment in relation to maintenance of groundwater levels across the site, but with particular emphasis on the Provincially Significant Wetlands and Hanlon Creek Tributary 'A'.

Figure 1

Hanlon Creek Business Park

Groundwater Monitoring Stations

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

June 3, 2010
Project: NRSI-0682H
Scale: 1:8,500 (11 x 17")
UTM Zone 17 NAD83

562000 562500 563000 563500 564000 564500 565000

4816000 4815500 4815000 4814500

N

HANLON PKY
MCWILLIAMS RD
DOWNEY RD
LAIRD RD
LAIRD RD W
HANLON RD
CLAIR RD
PHELAN DR
FORESTELL RD

Tributary A
Tributary A1

PZ-10S/D
PZ-8S/D
PZ-7S/D
PZ-6S/D
PZ-4S/D
PZ-2S/D
PZ-1S/D
PZ-9S/D

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 115A 116 116A 117 117A 118 118A 119 119A 120 120A 121 121A 122 122A 123 001 002 003 004 005-S 005-I 006

Legend

Banks Groundwater Engineering Limited (BGEL)

- Monitoring Well (BGEL)
- Monitoring Well (To Be Abandoned)
- Monitoring Well (Proposed)
- Mini-Piezometer (Existing)
- Mini-Piezometer (Proposed)
- Development Block Boundary
- Watercourse
- Enclosed Watercourse

Note: Monitoring Wells and Mini-Piezometers are current as of December 2009

0 100 200 300 Metres

NRSI_0682H_Fig1_GroundWaterMonitoring_8K_2010_06_03_SWM

6.2 Surface Water

SURFACE WATER

Purpose:

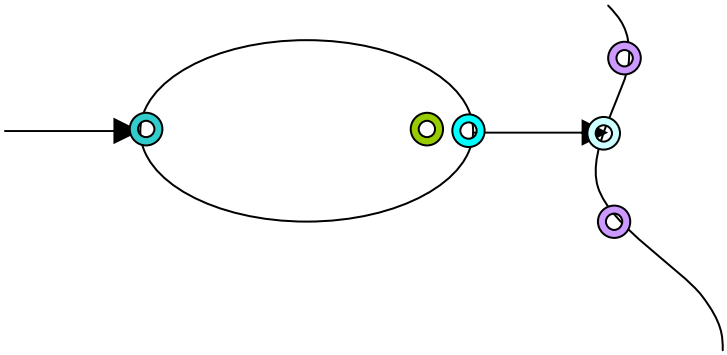
Stream temperature, flow, and turbidity are being monitored in order to aid with the evaluation of the performance of the stormwater management system for the HCBP as pertains to brook trout habitat in the receiving waters (Hanlon Creek Tributary A). Pond temperatures, flows and water quality are to be monitored as required in Ministry of Environment issued Certificates of Approval for Ponds 1-4. The monitoring program for Pond 5 (in Phase 3) has been approximated based on that for Ponds 1-4.

Methods:

Water Temperature, Flow, and Turbidity

Current monitoring within the streams is to be maintained by the City of Guelph during construction. This includes seven (7) temperature monitors, a depth sensor and a depth-velocity logger that record at 15-30 minute intervals. Turbidity is also to be monitored on a continuous basis beginning in the year 2010. Baseflow measurements as well as dissolved oxygen, pH and conductivity are also recorded at eight (8) stations monthly from May-October. Further approximately three (3) flow measurements per year are taken at higher flows at the location of the depth sensor to create a stage-discharge rating curve for the station.

Additional temperature monitors to be installed in the SWM ponds are recommended to follow the following plan:



- Pond inflow temperature and depth/flow monitor
- Pond outflow temperature and depth monitor (at bottom draw outlet)
- Pond cooling trench outlet temperature monitor
- Pond stratification temperature monitor cluster (3 monitors on a weighted line at varying depths)
- Stream temperature and depth monitors upstream and downstream of pond outfall

SURFACE WATER

This incorporates 8-10 continuous temperature monitors and 4-6 continuous depth/flow monitors to identify the temperature changes through the pond system and the impact on the receiving stream reach. Further, the existing seven temperature monitoring stations used for the predevelopment monitoring should be maintained. Flow measurements are taken at each download and at each sampling occasion (see below) to develop stage-discharge relationships for each depth logger.

Upon construction of all ponds in Phases 1, 2 and 3, this will incorporate a total of 13 instream monitoring stations (including the 8 existing stations). Eleven (11) stations will record depth and will have flow measurements taken at each site visit to develop rating curves for flow. Four (4) temperature/depth stations will be equipped with Telemetry and will provide an alarm when water temperatures and turbidity reach the set thresholds. These are installed at Stations HC-A(03), HC-A(06), HC-A(11), and HC-A(14).

Other Water Quality Parameters

To establish the performance efficiency of the ponds within the HCBP and to satisfy the MOE Certificate of Approval, the water quality program consists of grab samples at the inlet, outlet and downstream of each pond within the Tributary A. Parameters that are analyzed currently include:

- CBOD5
- Total Suspended Solids
- Total Phosphorus
- Dissolved Phosphorus
- Metals (total both dissolved and particulate, lead, zinc, copper)
- E. Coli
- Total Ammonia Nitrogen
- Nitrate - N
- Chloride

In order to calculate the concentration of un-ionized ammonia, temperature and pH of the water at each sampling station are measured at the time of sampling.

The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

a) The Ministry of Environment's Procedure F-10-1

b) The Ministry of Environment Publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater"

c) "Standard Methods for the Examination of Water and Wastewater"

The MOE Certificate of Approval requires a minimum of three (3) years of monitoring results. The monitoring frequency and monitoring parameters may be modified at that time if a written request is made to the District Manager. Yearly reports will address any need to modify the monitoring protocol.

Location:

Water Temperature, Flow, and Turbidity

Stream temperature monitoring occurs at seven (7) of the eight (8) stations that were

used for pre-development stream temperature and flow monitoring. This program will include 4 temperature stations equipped with telemetry which will provide an alarm when temperatures and turbidity exceed a set threshold. Additional stream temperature loggers are to be located at each of stormwater management ponds 1, 2, 3, 4 and 5, where needed to get upstream and downstream temperatures (13 stream temperature loggers in total). Each pond is to have a number of temperature loggers dependant on the inlet and outlet configurations. The following table summarizes the number and type of loggers required.

Pond	Number of Temperature Monitors	Number of Depth Monitors	Number of Depth/Velocity Monitors	Number of Turbidity Monitors
1	8	3		
2	7	4		
3	5	1		
4	6	2		
5	6	2		
Stream	13	11	1	4
Total	45	23	1	4

The grand total is 45 temperature loggers, 23 depth loggers, the existing depth-velocity logger, and 4 turbidity loggers. Figure 2 shows the locations of the loggers in the streams and stormwater management facilities. The telemetry equipment will be included for the instream temperature and turbidity loggers at Stations HC-A(04), HC-A(06), HC-A(11), and HC-A(14). Note that the number and location of loggers associated with Pond 5 is approximate and will be refined on detailed design of the Pond in Phase 3. Annual reporting will document the siting of these loggers.

Other Water Quality Parameters

Water quality grab samples are taken at each inlet and the outlet of each pond as well as at the nearest downstream station on Tributary A for a total of 14 locations.

Frequency:

Water Temperature, Flow, and Turbidity

The flow, temperature, and turbidity are monitored using continuous-in-time instruments to record and log data at 15-minute intervals from April to November and 30 minute intervals December to March. The equipment is checked and data is downloaded and reviewed monthly. Telemetry systems are included at some of the stations to facilitate remote data access, and will include an alarm system to provide notification when a threshold exceedance occurs.

Other Water Quality Parameters

The MOE Certificate of Approval requires a minimum of three (3) years of monitoring

results.

Samples at each station include at least one sample per season within one (1) hour following the commencement of a storm event, with one (1) being for the snowmelt freshets and a minimum of five (5) samples during summer months (June-September). An additional sample is taken 72 hours after precipitation if sufficient flow allows. Further, three (3) samples are taken in summer months at the stations in Tributary A a minimum of 72 hours after any rainfall to establish the influence of storm events on stream water quality.

Timing:

Water Temperature, Flow, and Turbidity

The flow and temperature are monitored using continuous-in-time instruments to record and log data.

Other Water Quality Parameters

Samples at each station include at least one sample per season within one (1) hour following the commencement of a storm event, with one (1) being for the snowmelt freshets and a minimum of five (5) samples during summer months (June-September). An additional sample is taken 72 hours after precipitation if sufficient flow allows. Further, three (3) samples are taken in summer months at the stations in Tributary A a minimum of 72 hours after any rainfall to establish the influence of storm events on stream water quality.

Thresholds and Observations of Concern:

There are two specific thresholds for temperature:

1. Any single temperature exceedance of 22℃
2. Any single temperature exceedance of 24℃

The threshold for turbidity is initially be set at 10 NTU and will be examined after 1 year of monitoring data is collected to determine whether this value is reasonable. Analysis of turbidity increases greater than 10% higher than the upstream monitoring location will be considered in this assessment.

In addition, concerns with water quality observations as compared to requirements of the stormwater management facility Certificates of Approval would constitute an observation of concern.

Contingency Measures:

Two different contingency measures apply according to the two thresholds defined above.

1. Any single temperature exceedance of 22℃ is analyzed in an annual temperature and flow monitoring report, including an investigation of the cause of the exceedance and recommendations for contingency measures as warranted. The investigation should consider the frequency, duration and spatial distribution of the exceedance.

SURFACE WATER

2. Any single temperature exceedance of 24°C requires that the Designated Persons provide notification of the exceedance and proposed corrective actions including the timeline for implementation to the City and GRCA within three business days of acquiring the information. This investigation should consider the frequency, duration and spatial distribution of the exceedance, seek to identify the cause of the temperature exceedance, and provide recommendations for adaptive management measures as warranted. If contingency measures are warranted, the design and implementation of selected measures should be completed as soon as possible. At the latest, the selected measures should be implemented in the year following the exceedance of 24°C.

Specific contingency measures are not recommended as automatic responses to the thresholds. The complexity of the interactions between factors that contribute to the ultimate stream temperatures makes it impossible to ensure that a specific contingency measure will be the appropriate response.

The following list of examples is provided to help initiate thinking and discussion about possible responses to the specific problems that result in a threshold being exceeded.

- Install additional plantings along the stream and/or grassed swales to block solar radiation.
- Install floating vegetated islands in the SWM ponds to block solar radiation.
- Install vegetated trellises or fabric canopies over ponds to block solar radiation
- Install photovoltaic solar panels mounted on posts in SWM ponds to block solar radiation.
- Provide refuge for brook trout by altering physical stream habitat.
- Retrofit buildings for green roof technology to decrease surface runoff and lower roof albedo
- Retrofit roofs and paved surfaces with light coloured materials to reduce temperature increases from impervious surfaces
- Increase plantings within and surrounding paved surfaces (parking lots) to reduce solar radiation gain from these impervious surfaces

Reporting:

Annual surface water monitoring reports are to be prepared based on each calendar year of data collected. Stream temperatures, pond facility temperatures, water quality and flow data are to be included in the summary and analysis of the data. Raw data is to be appended (digital format is acceptable).

<u>University Research</u>

In order to facilitate additional research in the area of stormwater management performance, a graduate research position was established at the University of Guelph to study 3 stormwater management ponds in the City of Guelph. The findings of this research may be utilized in annual reporting for this monitoring component to augment findings, conclusions and recommendations.

Figure 2

Hanlon Creek Business Park

Surface Water Monitoring Stations

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

August 12, 2010
Project: NRSI-0726
Scale: 1:8,500 (11 x 17")
UTM Zone 17 NAD83

N

SWM Pond #1
SWM Pond #2
SWM Pond #3
SWM Pond #4
SWM Pond #5
SWM Pond #6

Tributary A
Tributary A1

HC-A(14)
HC-P2(07)
HC-P2(04)
HC-P2(01-03)
HC-P1(06)
HC-P1(07)
HC-P1(01-03)
HC-P1(04)
HC-P1(05)
HC-P1(08)
HC-A(13)
HC-A(12)
HC-P2(06)
HC-P2(05)
HC-A(11)
HC-A(10)
HC-A(08)
HC-A(09)
HC-A(07)
HC-P3(05)
HC-P3(04)
HC-P3(01-03)
HC-A(06)
HC-A(05)
HC-A(04)
HC-P4(04)
HC-P4(01-03)
HC-P4(05)
HC-P4(06)
HC-A(03)
HC-A(02)
HC-P5(06)
HC-P5(01-03)
HC-A(01)
HC-P5(05)
HC-P5(04)

Legend

- Temperature Monitoring Station
- Temperature and Depth Monitoring Station
- Flow Monitoring Station
- Temperature, Turbidity and Depth
- Development Block Boundary
- Watercourse
- Enclosed Watercourse

0 100 200 300 Metres

561400 561600 561800 562000 562200 562400 562600 562800 563000 563200 563400 563600 563800 564000 564200 564400 564600

4816400 4816200 4816000 4815800 4815600 4815400 4815200 4815000 4814800 4814600 4814400

NRSI_0682H_SurfaceWaterMonitoring_Fig2_8K_2010_08_12_SWM

6.3 Fish

FISH

Purpose:

Fish are being monitored in order to aid with the evaluation of the performance of the stormwater management system for the HCBP, with emphasis on the temperature component of water quality.

Methods:

Quantitative Fish Sampling

Fish sampling is to be conducted in August or September of each year utilizing a depletion sampling method that is outlined in the Ontario Stream Assessment Protocol (Stanfield 2005). At each quantitative station, the chosen stream length is isolated from the rest of the stream using block nets. The block nets are small seine nets with a mesh size similar to the mesh on the dip net used with the electrofisher. The rope across the bottom of the net is weighted to keep it against the bottom of the channel, and the top of the net is a floating line. The nets were tied to trees or woody material, or secured on metal T-bar posts. Where necessary, rocks are placed along the bottom of the net to help keep it in place against the bottom of the channel.

A 2-person electrofishing crew conduct multiple passes of the enclosed area using a Halltech Model 1 backpack electrofisher set to a pulsating frequency of 60Hz, and an electric potential that is suitable for the conductivity of the water (in the past, 300 to 400 Volts). Once collected, the fish are identified, measured, weighed on site, and released outside of the sampling area. This process is repeated until the number of individuals caught exhibited a downward trend, or a minimum of three times. The number of individual fish, bulk weights, and minimum and maximum lengths are recorded for each species. Weights are measured to the nearest gram using an electronic balance. When fish are too small to register their weight on the electronic balance, an approximated weight of 1g is recorded. The water quality conditions, electrofisher settings, and number of shocking seconds for each pass are recorded. An effort is made to keep the sampling effort the same for each pass with respect to shocking seconds and netting technique.

Habitat information for the quantitative stations includes basic visual estimates of macrohabitats (riffles, pools, etc.), instream vegetation, instream cover, substrates, flow conditions, and overhead canopy shading. These habitat parameters provide a basic description of the conditions and help to understand the fish data. This information is intended to help interpret the fish community data for the quantitative stations. Because the focus of the monitoring is on the fish community, they are approximate and not intended for detailed comparison to other years of monitoring.

The analysis of the data for the three sampling stations provides estimates of the population and biomass of the fish at each station. A simple method for these calculations uses a regression of the data, which is plotted on a 2-dimensional graph with the catch from an individual fishing (1 pass) on the y-axis and the previous total catch (sum of previous passes) on the x-axis. This method is described by Zippen (1958) in the context of trapping small mammals. This calculation assumes a constant

probability of capture with each fishing pass. However, this method is inferior because it does not give valid estimates of the standard error of the estimated population size.

A better method employs maximum likelihood estimates, as described by Schnute (1983). This method calculates the probability of capture, and this probability can be either constant or variable. A study by Peterson et al (2004) showed that constant probability may not be an accurate assumption for electrofishing depletion sampling for salmonids, particularly for sampling larger watercourses. For this study, a constant probability has been assumed based on the small size of the watercourses and the small number of fish captured. When there are few fish, those fish that are visible during sampling are less likely to be missed than when there are many fish, and fish have less opportunity to escape in a small watercourse. These factors tend to make the probability of capture similar for each pass.

A computer software package called *Removal Sampling 2* by Pisces Conservation Ltd. can be used to perform the calculations using the maximum likelihood – constant probability method. The estimated population and biomass calculations should be carried out separately for each station. Estimates are made for all species combined, and capture of brook trout warrants a separate estimate for that species alone.

Spawning Survey

A brook trout spawning survey is to be carried out during the spawning season. Several site visits are conducted to document redds and observe any brook trout exhibiting spawning behaviour.

Location:

Quantitative Fish Sampling

A total of 5 sites are to be sampled. Three sampling sites in the northern portion of the subject property were sampled in 2006, 2007 and 2008. For 2009 and onward, 2 new sites were added, for a total of 5 sites. Fish sampling and benthic macroinvertebrate collection are conducted at each site, but they occur at separate stations to facilitate collection of both parameters on the same day. The stations are shown on Figure 3.

The locations of stations are based in part on historic knowledge of brook trout inhabitance. The stations are also positioned to detect any future impacts associated with stormwater management pond outlets. Selection of station limits gives attention to the recommendation in the Ontario Stream Assessment Protocol (Stanfield 2005) to establish the upstream and downstream extents of a site at a crossover point of the thalweg (concentration of flow). The specific sections of stream are selected to represent the habitat types in the vicinity of each station, and are a minimum of 30m of stream length.

Spawning Survey

The brook trout spawning survey area should include Tributary A from the new Road A to the confluence of Tributary A1, and Tributary A1 from the confluence with Tributary A to the section that has been tile drained (Figure 3).

FISH
Frequency: The quantitative fish sampling is to occur on 1 occasion each year. The brook trout spawning survey also occurs once each year.
Timing: The quantitative fish sampling is to occur in August or September. The brook trout spawning survey is to occur over a minimum of 2 site visits during the spawning period (typically falling sometime between October 1 and December 15).
Thresholds and Observations of Concern: Pre-construction fish monitoring did not result in capture of any brook trout at the quantitative monitoring stations. A specific quantitative threshold for brook trout is not appropriate unless sufficient numbers of brook trout become established such that they can be monitored in a quantitative manner. Although a threshold is not provided for brook trout, the overall fish community is being monitored as a surrogate indicator of the suitability of the aquatic habitat for brook trout. The results will be evaluated and compared to previous years data from the same stations. If any anomalies are seen, these will be addressed. Two thresholds have been developed as follows: • A 50% change in the number of taxa represents a potential decline in the suitability of the habitat for brook trout. Because coldwater fish communities typically have a lower species diversity, an increase in species diversity may represent a negative change in relation to the brook trout management objective. Specifically, the warm-water fish community may increase in species richness as a result of warmer water temperatures, which indicates that the habitat is becoming less suitable for brook trout. A decrease in species diversity may also represent a negative change in the suitability of the habitat for brook trout, likely attributable to some cause other than water temperature. • A 50% reduction in the number of fish captured represents a potential decline in the fish community resulting from habitat impacts. However, it may also represent an improvement in habitat suitability for brook trout based on temperature changes, as discussed above.
Contingency Measures: As a first response to the potential concern that results from the exceedance of the threshold described above, the data is to be analyzed to determine whether or not the change in fish community represents a negative change in suitability of the aquatic habitat for brook trout. If it is established that such a negative change has occurred, contingency measures are to be considered as follows. Specific contingency measures are not recommended as automatic responses to the thresholds or observations of concern. The complexity of interactions between factors that may contribute to a decline in the fish community makes it difficult to predict that a

FISH
specific contingency measure will be the appropriate response. The following list of examples is provided to help initiate thinking and discussion about possible responses to specific problems that result in thresholds/observation of concern being exceeded. <u>Negative Change in the Suitability of the Aquatic Habitat for Brook Trout</u> • Review groundwater and surface water data to determine possible causes. • Inspect the entire length of Tributaries A and A1 on the HCBP property for habitat changes or indicators of instability. • Implement measures as appropriate to modify or stabilize the habitat in Tributaries A and A1. • Refer to Section 6.2 Surface Water for the contingency measures associated with the temperature thresholds.
Reporting: The quantitative fish sampling and brook trout spawning survey data is to be analyzed and discussed in one annual aquatic monitoring report, which also contains reporting of the benthic invertebrate monitoring.

6.4 Benthic Invertebrates

BENTHIC INVERTEBRATES

Purpose:

Benthic invertebrates are being monitored in order to aid with the evaluation of the performance of the stormwater management system for the HCBP.

Methods:

Sampling for the benthic macroinvertebrate monitoring employs the sampling methodology from the Ontario Benthos Biomonitoring Network (OBBN) protocols (Jones et al 2005). Most of the following procedures are taken from those protocols. Some of the specimen processing procedures are not covered by the OBBN protocols.

According to OBBN, a total of 3 subsamples are collected at each station in stream habitats: 2 from riffles, and 1 from a pool. Where riffle and pool habitats are not clearly defined (as is the case for the subject watercourses) pools and riffles can be functionally defined as slow/deep and fast/shallow sections. For wadable streams, the OBBN protocol employs a Travelling Transect Kick and Sweep method. For each subsample, a total of at least 10 linear metres of transect must be sampled in 3 minutes. For small streams such as those in this study, this requires that several transects be positioned in the same riffle or pool in order to sample 10 metres of transect. Beginning at one bank and moving across the transects, the substrate is disturbed to a depth of approximately 5cm by vigorously kicking the substrate. A 500-µm-mesh D-net is held downstream of and close to the disturbed area by the person sampling. The net is held on or close to the bottom, and is swept back and forth so that dislodged macroinvertebrates will be carried into the net. In areas of slow current, the sweeping motion is important for collecting the macroinvertebrates into the net. A stopwatch is used to time the sampling.

When sampling is complete, the net is rinsed and the sample is placed in plastic jars. A maximum of 2 jars are used per sample. Where some of the sample is discarded, the amounts removed and retained are documented by mass, measured in grams. The sample is then preserved with a 10% concentration of buffered formalin and sent to a professional taxonomist for identification. For pre-construction monitoring, samples were sent to Richard Bland Associates in London, Ontario. Samples are identified to the lowest practical taxonomic level. Subsampling is conducted by randomly dipping a small portion of the sample from a container until at least 200 organisms were obtained. After reaching the 200th organism, the portion being sampled is completed in order to facilitate measurement of the proportion of the total sample that is subsampled and identified. The subsample proportion is determined by measuring the total sample weight/volume before identification and the remaining sample weight/volume after identification. The difference between those 2 measurements represents the portion sampled, which is recorded as a percentage of the total sample. While the OBBN protocol requires that a minimum of 100 organisms be collected, 200 organisms per subsample are collected to provide a robust sample for this program's use of the Percent Model Affinity analysis.

The OBBN Streams field sheet is used to record habitat information at the benthic macroinvertebrate sampling stations. The form includes both measured and estimated parameters, and facilitates comparison with other years provided the estimated

parameters are treated as approximations.

Analysis is performed using the Percent Model Affinity (PMA) method developed in New York State by Novak and Bode (1992). This method was adapted for southern Ontario by Dr. David Barton (1996) of the University of Waterloo.

The model communities used for analysis in this study are based on recent values from Dr. Barton for streams with mud and cobble/gravel substrates sampled in August. During pre-construction monitoring, the model community for mud substrates was used for BTH-001, BTH-003, BTH-004 and BTH-005, and the model community for cobble/gravel substrates is used for BTH-002. The appropriate model community should be selected according to the dominant substrate material at the 2 stations being added beginning in 2009.

The family level of taxonomic resolution is used because many of the macroinvertebrates are very small in August and September, making it difficult or impossible to identify some of the specimens beyond their family. The model communities for rock and mud substrates are occasionally updated by Dr. Barton, and he should be contacted if more recent values are desired. The model community used for pre-construction monitoring can be obtained from Natural Resource Solutions Inc.

The equation used to determine the percent similarity of community (PSC) is as follows:

$$PSC = 100 - 0.5 \Sigma \left| a - b \right|$$

Where: a is the model community value for a taxonomic group expressed as a percentage of the organisms in the model community; and

b is the percentage of the same taxonomic group in a sample from the stream being studied.

The sample PSC value is calculated by summing the absolute differences between the family model values and the families in the sample, multiplying the sum by 0.5 and subtracting this number from 100 (Novak and Bode 1992). The sample PSC value is then compared to the critical PSC value for the chosen model community.

Each critical PSC value is effectively a lower confidence limit of the mean for the expected community. It is essentially a statistical one-tailed t-test comparing a single observation with the mean of the sample, where the P-Value = 0.05 (Zar 1999)). The critical PSC values were provided by Dr. Barton along with the model community data. The critical PSC value used for mud substrate in August is 42.12, and the critical PSC value used for rock substrate in August is 50.70 (Barton 2007).

This index does not assign a degree of impairment or non-impairment. Rather, significant impact at a sample site is determined when the calculated sample PSC value is less than the critical PSC value. Significant impact implies that the sample community is statistically significantly different from the model community. A determination of no significant impact occurs when the calculated sample PSC value is greater than the critical PSC value (Barton 1996).

The PMA analysis is conducted for each station with the 3 subsamples (riffles and pool)

BENTHIC INVERTEBRATES
electronically combined into one sample, which is the intention of the OBBN protocol. In addition to PMA analysis, three other simpler metrics are calculated to provide additional insight into the water quality conditions at the sampling sites. They are: • the number of taxa present in each sample (taxa richness), • the percentage of individuals in each sample belonging to the taxonomic groups Ephemeroptera, Plecoptera, and Tricoptera (% EPT), and • the percentage of individuals in each sample that were the dominant taxon (% dominant taxon).
Location: A total of 5 sites are to be sampled. Three sampling sites in the northern portion of the subject property were sampled in 2006, 2007 and 2008. For 2009 and onward, 2 new sites were added, for a total of 5 sites. Fish sampling and benthic macroinvertebrate collection are conducted at each site, but they occur at separate stations to facilitate collection of both parameters on the same day. The stations are shown on Figure 3. The locations of stations are based in part on historic knowledge of brook trout inhabitance. The stations are also positioned to detect any future impacts associated with stormwater management pond outlets.
Frequency: The benthic invertebrate sampling is to occur on 1 occasion each year.
Timing: The benthic invertebrate sampling is to occur in August or September.
Thresholds and Observations of Concern: The results for all metrics will be evaluated and compared to previous years data from the same stations. If any anomalies are seen, these will be addressed. Specifically, thresholds were developed for three benthic invertebrate metrics based on the degree of variation observed in the pre-construction monitoring data. The thresholds are as follows: • For the Percent Model Affinity (PMA) analysis, the threshold is an “Impact” determination at a station for 2 consecutive years following 2 consecutive years where the determination was “No Impact” at that station. • For Total Taxonomic Richness, the threshold is a 50% decline in the total number of taxa at a station, as compared to the results from the previous year. • For EPT Taxonomic Richness, the threshold is a 50% decline in the number of EPT taxa at a station, as compared to the average results from the previous 2 years.
Contingency Measures: Specific contingency measures are not recommended as automatic responses to the

BENTHIC INVERTEBRATES
thresholds or observations of concern. The complexity of interactions between factors that may contribute to a decline in the benthic community makes it difficult to predict that a specific contingency measure will be the appropriate response. The following list of examples is provided to help initiate thinking and discussion about possible responses to specific problems that result in thresholds/observations of concern being exceeded. • Review groundwater and surface water data to determine possible causes. • Review the benthic invertebrate data for substantial changes in habitat characteristics at the sample site. • Inspect the entire length of Tributaries A and A1 on the HCBP property for habitat changes or indicators of instability. • Implement measures as appropriate to modify or stabilize the habitat in Tributaries A and A1.
Reporting: The benthic invertebrate data is to be analyzed and discussed in one annual aquatic monitoring report, which also contains reporting of fish monitoring.

Figure 3

Hanlon Creek Business Park

Aquatic Monitoring Stations

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

March 3, 2010
Project: NRSI-0726
Scale: 1:8,000 (11 x 17")
UTM Zone 17 NAD83

561500 562000 562500 563000 563500 564000 564500

4816500 4816000 4815500 4815000 4814500

BTH-004
EMS-004
EMS-002
BTH-002
BTH-003
EMS-003
BTH-001
EMS-001
EMS-005
BTH-005

Tributary A
Tributary A1

DOWNEY RD
HANLON PKY
MCWILLIAMS RD
LAIRD RD
LAIRD RD W
HANLON RD
CLAIR RD
PHELAN DR
FORESTELL RD

Legend

- Benthic Monitoring Station (BTH)
- Electrofishing Monitoring Station (EMS)
- Brook Trout Spawning Survey Area
- Development Block Boundary
- Watercourse
- Enclosed Watercourse

0 100 200 300 Metres

NRSI_0682H_AquaticMonitoring_8K_2010_03_03_GCS

6.5 Vegetation and Soils

VEGETATION and SOILS

Purpose:

Vegetation and soils are being monitored in order to i) provide baseline information on interactions and track changes that may occur to the terrestrial and wetland ecology within the new industrial lands as a result of construction and the stormwater management facilities and ii) detect any effects on the groundwater and wetlands on the HCBP property that are attributable to the HCBP and/or the neighbouring Mast-Snyder Gravel Pit.

Methods:

Vegetation

The vegetation monitoring occurs at 10m x 10m permanent plots. At each of the 9 vegetation plots, herbaceous plants, shrubs, and trees are recorded.

The following information is recorded for each vegetation group:

Herbaceous Species:

Five subplots are randomly chosen within each permanent plot. Randomly generated bearings and distances are used, and are taken from the southwest corner of each plot. The same bearings and distances are used in each of the 9 plots. Comparison of year to year data is made more meaningful by using the same approximate subplot locations in all years of monitoring. Each herbaceous subplot is $1m^2$. All of the plant species observed within each subplot are recorded; including their number and percent cover (the number of individuals of dense growing species like sedges, grasses and moss was not recorded). In addition, all herbaceous species observed within the 10 x 10m plots are recorded, along with their relative abundance within the plot (i.e. D – Dominant, A – Abundant, O – Occasional, R – Rare).

Shrubs:

All shrub species within each 10m x 10m permanent plot are recorded, as well as their approximate percent cover.

Trees:

Tree species within each 10m x 10m permanent plot are recorded. In 2006 and 2007, all trees having a DBH ≥10cm were tagged using an aluminum tag nailed into the tree at breast height (approximately 1.37m above ground). Tags are added to any trees that have become >10cm DBH since monitoring was initiated in 2006 and 2007. The information on the tags includes the plot number followed by the tree number.

For each tree >10cm DBH, the following information is recorded: species, physical condition and diameter at breast height (dbh). The overall health of each tree is recorded (ranging from excellent to very poor) based on visible indicators of decline. If the tree is dead (a snag), no other information is recorded. A densiometer is used to estimate canopy cover in each of the vegetation plots.

VEGETATION and SOILS

Within each plot, canopy cover readings are taken while facing north, south, east and west to provide an average estimate.

Soils

A central location within each 10m x 10m permanent plot is randomly selected and a dutch auger is used to obtain a soil column approximately 1.20m in length. If the auger encounters till or the soil is otherwise impenetrable, soil columns may be less than 1.20m in length.

Information is recorded for each soil sample according to the *Field Manual for Describing Soils in Ontario* (Ontario Centre for Soil Resource Evaluation 1993), and includes:

- depth and texture of both the organic and mineral soil horizons;
- the effective texture of the mineral layer; and
- the presence and depth of mottles, gley, bedrock, water table and carbonates.

The moisture regime is determined from the pore pattern and depth of the mineral soil material, the topographic position of the site and characteristics of the soil profile such as mottling or gley which indicates impeded drainage (Ontario Centre for Soil Resource Evaluation 1993).

Location:

A total of 8 permanent plots were established and monitored in the 2006 pre-construction year. An additional plot was added in 2007 (VEG 009) to gain baseline information on the provincially significant wetland (PSW) situated immediately east of Downey Road. A total of 9 permanent vegetation plots were established at the initiation of monitoring. Plots were selected by means of stratified random sampling. This sampling technique involved use of vegetation community mapping to guide sample selection (ELC mapping was completed as part of the original EIS) (NRSI 2004). A range of vegetation plot types and locations were chosen.

The permanent 10m x 10m plots focus primarily on wetlands within the study area, as well as larger upland woodlots north and south of Laird Road. The southwest corner of each plot is marked with a 6m high metal t-post with the top painted bright orange. Flagging tape is also used to in the vicinity to make the location more obvious.

Plots are surveyed during each year of monitoring for vegetation and soils (Figure 4).

Frequency:

Monitoring occurs each year with the following frequency:

Vegetation and soils: 1 occasion

Timing:

Monitoring occurs at specific times of the year as follows:

Vegetation and soils: June or July

VEGETATION and SOILS

Thresholds and Observations of Concern:

The results for all metrics will be evaluated and compared to previous years data from the same plot, as well as to other plots monitored the same year. If any anomalies are seen, these will be addressed. Specifically, the following vegetation parameters will be considered thresholds:

- A change in herbaceous cover by more than 25%.
- A change in species diversity by more than 25%.
- A change in canopy cover by more than 25%.

Contingency Measures:

Specific contingency measures are not recommended as automatic responses to the thresholds or observations of concern. The complexity of interactions between factors that may contribute to a shift in flora or significant change in soil moisture regime makes it difficult to ensure that a specific contingency measure will be the appropriate response.

The following list of examples is provided to help initiate thinking and discussion about possible responses to specific problems that result in thresholds/observation of concern being exceeded.

<u>Water levels/Quality</u>

- Analyze water quality sampling and determine source.
- Refer to Section 6.1 Groundwater for the contingency measures associated with groundwater thresholds.

<u>Decrease in vegetation/shift in species composition</u>

- Initiate restoration efforts to enhance number of native wetland/woodland species.
- Provide educational material to neighbouring properties outlining importance of natural features and their protection.
- Provide additional signage regarding trail closures, etc.
- Refer to Section 6.1 Groundwater for the contingency measures associated with groundwater thresholds.

Reporting:

The vegetation, soil, breeding bird, and amphibian data is to be analyzed and discussed in one annual terrestrial and wetland monitoring report.

6.6 Breeding Birds

BREEDING BIRDS
Purpose: Breeding birds are being monitored in order to provide baseline information on interactions and track changes that may occur to the terrestrial and wetland ecology within the new industrial lands as a result of construction and stormwater management facilities.
Methods: <u>Breeding Birds</u> Breeding bird point counts are performed according to the standard Forest Bird Monitoring Program System (FBMP). According to this protocol, each of the 9 stations (10m x 10m permanent plots) is visited between dawn and 10:00am on 2 occasions during the breeding bird season (June/July). Ten minute point counts are conducted at each of the stations. Bird species, breeding evidence, activity and the number of birds encountered are recorded.
Location: In the 2006 pre-construction year, a total of 8 permanent plots were established and monitored. An additional plot was added in 2007 (Station 009) to gain baseline information on the provincially significant wetland (PSW) situated immediately east of Downey Road. In response to agency and public comments, an additional monitoring station within the Heritage Maple Grove was established and monitored in 2009 to assess breeding bird populations. Altogether, there are 10 breeding bird monitoring stations which are surveyed each year (Figure 4).
Frequency: Monitoring occurs each year with the following frequency: Breeding birds: 2 occasions
Timing: Monitoring occurs at specific times of the year as follows: Breeding birds: June/July
Thresholds and Observations of Concern: A threshold of 25% change in species diversity will be considered to represent a potential concern. The results of all metrics will be evaluated and compared to previous years data from the same plot, as well as to other plots monitored the same year. If any anomalies are seen, these will be addressed.
Contingency Measures: Specific contingency measures are not recommended as automatic responses to the thresholds or observations of concern. The complexity of interactions between factors

BREEDING BIRDS
that may contribute to a decline in fauna species makes it impossible to ensure that a specific contingency measure will be the appropriate response. The following list of examples is provided to help initiate thinking and discussion about possible responses to specific problems that result in thresholds/observation of concern being exceeded. <u>Decline in bird species</u> • Assess success of naturalization/restoration plantings. If plantings are not establishing, increase buffer/natural area plantings. • Assess status of restoration plantings (e.g. if shrub and tree species are beginning to proliferate in open meadow areas, return naturalized area to intended habitat type). • Increase buffer plantings or alter if necessary. • Provide educational material to neighbouring properties outlining importance of natural features, wildlife and their protection. • Provide additional signage regarding trail closures, etc.
Reporting: The vegetation, soil, breeding bird, and amphibian data is to be analyzed and discussed in one annual terrestrial and wetland monitoring report.

6.7 Amphibians

AMPHIBIANS
Purpose: Amphibians are being monitored in order to i) provide baseline information on interactions and track changes that may occur to the terrestrial and wetland ecology within the new industrial lands as a result of construction and stormwater management facilities and ii) detect any effects on the groundwater and wetlands on the HCBP property that are attributable to the HCBP and/or the neighbouring Mast-Snyder Gravel Pit.
Methods: <u>Amphibians</u> Evening amphibian surveys are conducted using the Marsh Monitoring Program (Bird Studies Canada 2003, Weeber and Vallianatos 2000). Monitoring focuses on calling anurans during 3 minute call counts. Call intensity and an estimated number of amphibian individuals are recorded following the Marsh Monitoring Program protocol. Immediately after the three-minute monitoring period, time, air and water temperature, pH, wind speed, and cloud cover are recorded for each station.
Location: In the 2006 pre-construction year, a total of 8 permanent plots were established and monitored. An additional plot was added in 2007 (Station 009) to gain baseline information on the provincially significant wetland (PSW) situated immediately east of Downey Road. In response to agency and public comments, additional amphibian monitoring stations throughout the business park were established and monitored in 2009. Altogether, there are 15 amphibian monitoring stations which are surveyed each year (Figure 4).
Frequency: Monitoring occurs each year with the following frequency: Amphibians: 3 occasions
Timing: Monitoring occurs at specific times of the year as follows: Amphibians: late April through early June
Thresholds and Observations of Concern: A change in species diversity of 25% or more will be considered a threshold that may constitute a concern, as will be a significant change in species abundance, measured by a difference in two call codes. The results for all metrics will be evaluated and compared to previous years data from the same plot, as well as to other plots monitored the same year. If any anomalies are seen, these will be addressed.

AMPHIBIANS
Contingency Measures: Specific contingency measures are not recommended as automatic responses to the thresholds or observations of concern. The complexity of interactions between factors that may contribute to a decline in fauna species makes it difficult to ensure that a specific contingency measure will be the appropriate response. The following list of examples is provided to help initiate thinking and discussion about possible responses to specific problems that result in thresholds/observation of concern being exceeded. <u>Hydroperiod changes in pond</u> • Review wetland configuration to see where changes could be made. • Potentially increase depth of wetland. <u>Decline in amphibian species</u> • Wetland creation where feasible. • Enhancement plantings to improve wetland condition. • Additional monitoring – broaden range of parameters (i.e. water quality). • Increase buffer plantings or alter if necessary. • Provide educational material to neighbouring properties outlining importance of natural features, wildlife and their protection. • Provide additional signage regarding trail closures, etc.
Reporting: The vegetation, soil, breeding bird, and amphibian data is to be analyzed and discussed in one annual terrestrial and wetland monitoring report.

Figure 4

Hanlon Creek Business Park

Terrestrial and Wetland Monitoring Stations

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

July 2, 2010
Project: NRSI-0726
Scale: 1:8,000 (11 x 17")
UTM Zone 17 NAD83

562000 562500 563000 563500 564000 564500

4816000 4815500 4815000 4814500

HANLON PKY
MCWILLIAMS RD
DOWNEY RD
LAIRD RD
HANLON RD
CLAIR RD
PHELAN DR
LAIRD RD W
FORESTELL RD

Legend

- Amphibian Monitoring Station (AMP)
- Avian Monitoring Station (AVI)
- Vegetation Monitoring Station (VEG)

0 100 200 300 Metres

N

NRSI_0682G_Fig4_TerrestrialMonitoring_8K_2010_07_02_SWM

6.8 Salamanders

The need for ongoing salamander monitoring and associated Standard Operating Procedures have not been determined at the time of writing. In spring 2009, NRSI conducted salamander trapping surveys with the use of un-baited minnow traps to assess the potential presence of Jefferson salamander (*Ambystoma jeffersonianum*). A more intensified monitoring program was requested by the Ministry of Natural Resources (MNR), therefore, in spring 2010, an extensive salamander monitoring program is being conducted by NRSI. The focus of the monitoring plan will be to re-assess presence/absence of suitable breeding habitat for Jefferson salamander and determine presence/direction of any salamander movements to and from natural areas within the HCBP lands. The monitoring plan has been developed following extensive discussions involving NRSI, Ministry of Natural Resources, Guelph District, Dr Jim Bogart from the University of Guelph and City staff. Results obtained from 2010 monitoring will be supplemented by findings from 2009 surveys. A compilation of these results will inform the need for further salamander monitoring.

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7.1 Pre-Construction Monitoring Reports

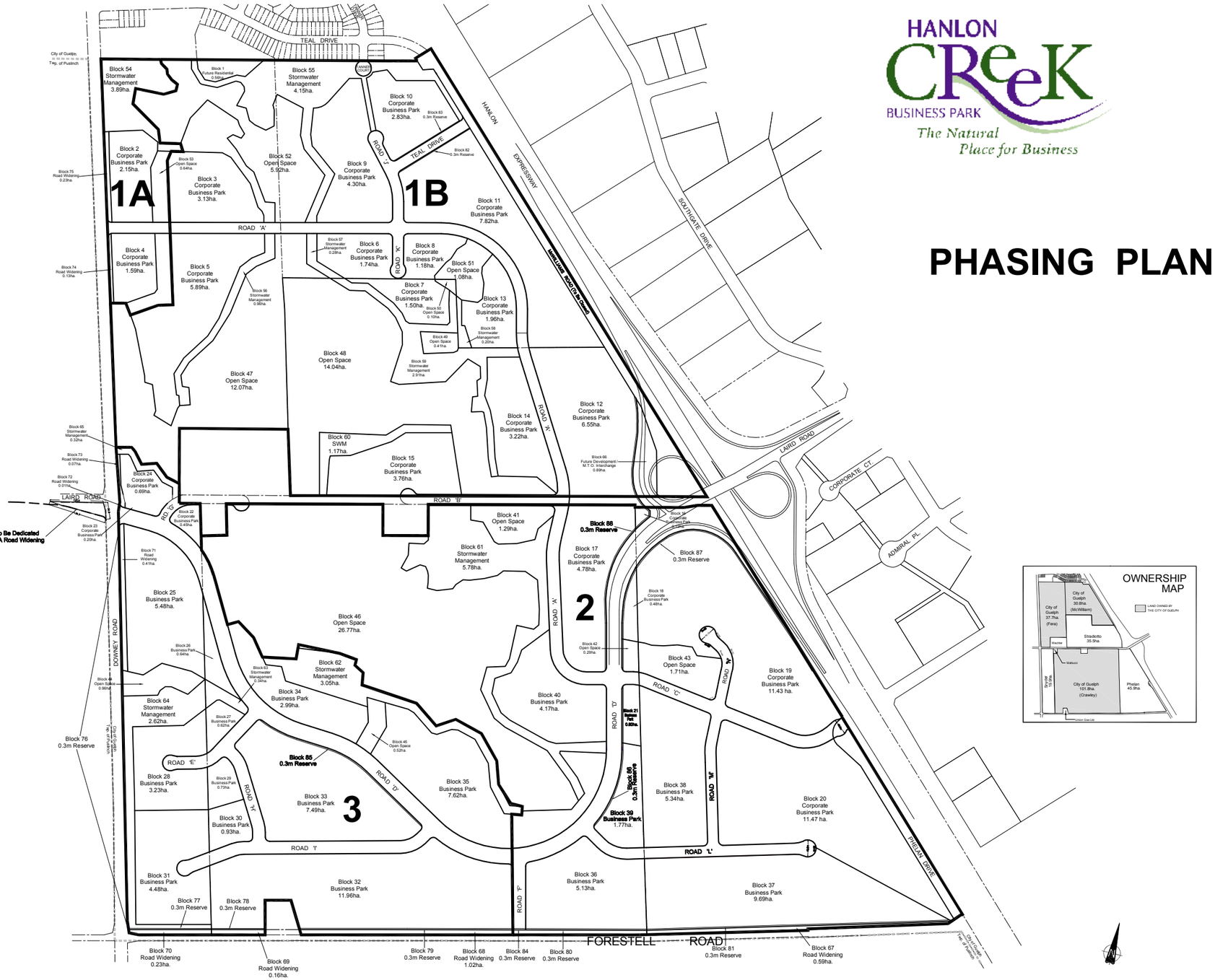
Numerous pre-construction monitoring reports have been prepared for the HCBP. All reports were submitted to the City of Guelph Economic Development & Tourism Services. They are listed in Table 2

Table 2. List of Pre-Construction Monitoring Reports

Title	Author	Date
Hanlon Creek Business Park Environmental Monitoring Program Pre-Construction (2006) Terrestrial and Wetland Monitoring	Natural Resource Solutions Inc.	November 2006
Hanlon Creek Business Park Pre-Construction Aquatic Monitoring 2006	Natural Resource Solutions Inc.	December 2007
Hanlon Creek Business Park Environmental Monitoring Program Pre-Construction Terrestrial and Wetland Monitoring (2007)	Natural Resource Solutions Inc.	December 2007
Hanlon Creek Business Park Pre-Construction Aquatic Monitoring 2007	Natural Resource Solutions Inc.	December 2007
Hanlon Creek Business Park Environmental Monitoring Program Pre-Construction Terrestrial and Wetland Monitoring (2008)	Natural Resource Solutions Inc.	January 2009
Hanlon Creek Business Park Pre-Construction Aquatic Monitoring 2008	Natural Resource Solutions Inc.	February 2009
Hanlon Creek Business Park Environmental Monitoring Program Pre-Construction Terrestrial and Wetland Monitoring (2009)	Natural Resource Solutions Inc.	March 2010
Hanlon Creek Business Park Pre-Construction Aquatic Monitoring 2009	Natural Resource Solutions Inc.	March 2010
Hanlon Creek Business Park City of Guelph Environmental Implementation Report Hydrogeology Report	Banks Groundwater Engineering Limited	May 2008
Hanlon Creek Business Park – 2008 Groundwater Monitoring Program Technical Memorandum	Banks Groundwater Engineering Limited	May 2009
Hanlon Creek Business Park – 2009 Groundwater Monitoring Program Technical Memorandum	Banks Groundwater Engineering Limited	February 2010
City of Guelph Hanlon Creek Flow and Temperature Monitoring Technical Memorandum	TSH (now AECOM)	February 2008
City of Guelph Hanlon Creek Tributary A Flow and Temperature Monitoring Technical Memorandum	TSH (now AECOM)	February 2009
City of Guelph 2009 Hanlon Creek Tributary A Surface Water Monitoring Report	TSH (now AECOM)	January 2010

APPENDIX I

DRAFT PLAN OF SUBDIVISION



HANLON CREEK BUSINESS PARK
The Natural Place for Business

PHASING PLAN

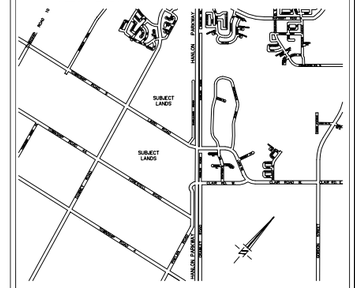
ASTRID J. CLOS
PLANNING CONSULTANTS

Phone: (519) 836-7526 (836-PLAN)
Fax: (519) 836-9568
Cell: (519) 710-7526 (710-PLAN)
Email: astrid.clos@sympatico.ca
Web: www.ajcplanning.ca
423 WOOLWICH STREET, SUITE 2
GUELPH , ONTARIO N1H 3X3

DRAFT PLAN OF SUBDIVISION
HANLON CREEK BUSINESS PARK
23T-03501

DATE: MAY 15, 2006	SCALE 1:3000
PROJECT No. : 0581	DRAWN BY: G.K.S.

KEY PLAN N.T.S.



LEGAL DESCRIPTION

Part of Lots 16, 17, 18, 19, & 20, Concession 4
and Part of Lots 16, 17, 18, & 19, Concession 5
(Former Geographic Township of Puslinch)
City of Guelph

NOTES:
1) CONCEPT PLAN ORIGINALLY PREPARED BY JOHN D. ROGERS & ASSOCIATES INC., MISSISSAUGA, ONTARIO, PLAN DATED APRIL 19, 2002.
2) TOPOGRAPHIC MAPPING PROVIDED BY NORTHWAY MAP TECHNOLOGY.
3) PREVIOUS DRAFT PLAN PREPARED BY GSP

LAND USE SCHEDULE

DESCRIPTION	LOTS/BLKS.	AREA (ha.)
FUTURE RESIDENTIAL	1	0.66
CORPORATE BUSINESS PARK	2-24	75.64
BUSINESS PARK	25-40	73.31
OPEN SPACE	41-53	65.53
STORMWATER MANAGEMENT	54-65	25.67
FUTURE DEVELOPMENT / M.T.O. INTERCHANGE	66	0.89
ROAD WIDENING	67-75	2.85
0.3m RESERVE	76-88	0.00
ROADS		27.19
TOTAL		271.64

ADDITIONAL INFORMATION
(UNDER SECTION 51(17) OF THE PLANNING ACT)
INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j and i ARE AS SHOWN ON DRAFT PLAN
h) Piped Water
i) Sandy Loam
k) Full Municipal Services

OWNER'S CERTIFICATE
I AUTHORIZE ASTRID J. CLOS, PLANNING CONSULTANTS, TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF GUELPH.

L. KATE QUARRIE, Mayor — FEBRUARY 18, 2004 DATE
CLERK — FEBRUARY 18, 2004 DATE
PLACIDO STRADIOTTO, President, STRADIOTTO BROTHERS HOLDINGS LIMITED, Land Owner — DECEMBER 6, 2002 DATE
SERENO STRADIOTTO, Secretary, STRADIOTTO BROTHERS HOLDINGS LIMITED, Land Owner — DECEMBER 6, 2002 DATE
THOMAS PHELAN, PHELAN FARM TRUST AND EDWARD PHELAN, Land Owner — DECEMBER 5, 2002 DATE
STANFORD ROBERT SNYDER, Land Owner — NOVEMBER 22, 2002 DATE

SURVEYOR'S CERTIFICATE
I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

JEFF BUISMAN, O.L.S., Van Harten Surveying Inc. — DECEMBER 4, 2002 DATE

REVISION DATES

January 27, 2004
June 17, 2004
September 20, 2004
November 8, 2004
January 5, 2005

Feb 19,2010–3:28pm
H:\05-164\16438-05\acad\0581 Phasing Plan.dwg