September 29, 2005

Melissa Evers
Maine Department of Environmental Protection
Bureau of Land and Water Quality
State House Station 17
Augusta, ME 04333

RE: Birch Stream Draft TMDL
Review Comments from City of Bangor

Dear Melissa,

The City of Bangor is pleased to submit review comments on the Draft TMDL for Birch Stream. The comments contained herein are based on careful review by a number of City Departments.

We believe that the dialogue that was held at the September 26 meeting at the DEP Bangor Office was productive. We support continuing face to face communication as this process proceeds.

The City has a few general comments and several specific comments.

GENERAL COMMENTS

1. The ultimate purpose of this document is unclear. Please clarify the ultimate intent in terms of what the document will be used for and how – guidance? Voluntary compliance? Regulation and enforcement?

2. There are a significant number of stakeholders in the Birch Stream watershed, yet it appears that only a very few have been responsive to the review process. For some reason, the "Public Participation" process appears to have been very incomplete at best.

3. There appears to be an urgency to the Birch Stream TMDL process that we do not understand. (We were first informed of an October deadline at the September 26 meeting). Because of this "urgency", there has been inadequate time for all stakeholders to make meaningful contributions to the process. The goal of improving water quality is much better served by developing the document carefully rather than quickly.

4. The implementation process beyond this document is not clear. Our questions include:

   - Who are the Stakeholders?
   - What is stakeholder liability?
   - What are the monitoring and enforcement mechanisms?
   - Who makes decisions?
   - Will there be required implementation projects?
   - Who pays?

5. There are references to testing to determine progress / compliance. Does "compliance" mean attainment of applicable water quality standards? Will there be a commitment from DEP to do annual or semi-annual testing of Birch Stream for this purpose?

6. The draft TMDL is not clear on the goal of the program. This was clarified at the September 26 meeting, but we wish to include it here for the record.

   It is understood that the goal of this TMDL is as stated on Page 12,

   "The goal of this TMDL is to have Birch Stream meet applicable water quality criteria".

   It is further understood that the statement made on page 13, which states:

   "This TMDL sets a target of 8% impervious cover (IC)".

   is <u>not</u> the goal and should be deleted or reworded to clearly state that fact.

7. The City recommends using this Document to clearly identify and define Birch Stream as follows:

   Birch Stream begins at the outfall of the box culvert that traverses under Airport Mall, and flows as a more or less natural stream to the Kenduskeag Stream.

   Upstream of the box culvert outfall is a composition of man-made facilities that comprises a Municipal Separate Storm Sewer System (MS4) as defined by MEDEP in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, as follows:

   "Municipal separate storm sewer system" or ("MS4") means conveyances for stormwater, including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made

channels or storm drains (other than publicly owned treatment works and combined sewers) owned or operated by any municipality, sewer or sewage district, fire district, State agency or Federal agency or other public entity that discharges directly to surface waters of the State."

8. We request that the following statements be added: (somewhere) "Birch Stream has a length of .5 miles. There are a total of 737 miles of impaired (non-attainment) streams in Maine."

9. With the recent adoption of the "Non-Stormwater Discharge" Ordinance by the City of Bangor, the City has established local regulatory authority and control over discharges to its storm drain system. A clear definition of the point that separates "Birch Stream" from the City's "Municipal Storm Sewer System" (MS4) will make future efforts to reduce impairments more practical to implement.

10. It is not clear why this stream is Class B.

    For the past 50 years, it has been primarily the drainage ditch connecting the Airport Complex to the Kenduskeag Stream.

    Other than a short stretch at the lower end, the entire stream flows through private property. There is no public access and no public benefit.

    "Class B waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired."

    Birch Stream will never be used for drinking water, and is probably too shallow and too narrow to be used for recreational fishing or boating. It is not used for industrial process and cooling water, and is not used to generate hydroelectric power. Birch Stream might possibly support Brook Trout below the waterfall. Designated Uses are the basis of water quality criteria to support those uses, but there appears to be no defined designated use in Birch Stream to warrant class B.

11. It should be noted that Bangor and the Airport Entities have already been very active in addressing the Birch Stream impairment issues.

    - In November of 2003, a major cleanup of Birch Stream was undertaken. Over five tons of trash and debris were removed from the short section of stream directly behind Airport Mall. (This five tons of trash are unrelated to impervious area).

- There have been four major very expensive Deicing Fluid Runoff Control Projects undertaken by the commercial and military entities at the Airport, which are expected to address the major stressor of concern.

- The City has embarked on a significant mapping project to locate and identify all sanitary sewer and storm drain facilities within the Birch Stream watershed. This mapping is fundamental to all other BMPs to be undertaken.

- A considerable amount of sampling has been done by several parties to monitor the health of Birch Stream.

- An educational and outreach program has been implemented to raise awareness of stormwater issues.

- Several BMPs have been implemented, including employee training.

12. It should be noted that data and testing that identifies impairment of Birch Stream is all very recent. Given the historical uses and activities in the watershed over the past 50 years, it is highly likely that impairment has existed for a very long time.

SPECIFIC COMMENTS

13. PAGE 7 Description of Impairments

    Reference is made to tests conducted in 1997 and 1999, and the statement that airport deicing runoff is connected to the impairment of Birch Stream. During the 1997 and 1999 timeframes, deicing fluid use was below the 100,000 gallon threshold and was essentially a permitted discharge under the Airport NPDES Permit,

14. PAGE 8 Stressors of Concern

    Reference is made to the document “Urban Streams Non Point Source Assessments in Maine” or “Urban Streams Project, PETE/MDEP, 2005). When this document was distributed to stakeholders in the Birch Stream Watershed, , it was not made clear that this was part of an “urgent” TMDL project with short-term deadlines and potential long term implications to stakeholders.

15. PAGE 8 Stressor 1 – Propylene Glycol.

It should be noted that testing done by the Airport since 11/23/03 does not support the allegation that Propylene Glycol is currently a significant stressor of Birch Stream.

It should be further noted that the capital investments ($3 Million +++) that have been made by both the commercial and military entities at the airport on deicing runoff capture and treatment will insure that Propylene Glycol will not be a stressor in the future.

16. PAGE 9 Stressor 3 – High Peak Flows.

We question that high peak flows caused by impervious area is a stressor. According to a former property owner adjacent to Birch Stream, the erosion below Ohio Street was caused primarily by a stream alteration resulting from filled land.

Furthermore, there needs to be more discussion regarding the listing of high percentage of impervious surfaces as a likely source, or the reduction of impervious area as a likely solution. By casually mentioning a high percentage of paved / roofed surfaces (33%) is somewhat misleading both here and elsewhere in the document.

This number also does not take into account the airport retention dam, which actually restricts flow to the stream during peak flow periods. This restriction eliminates the largest % of IC from even being a factor in the flow rate.

In Maine, we have frozen ground for 5-6 months of the year. All precipitation that occurs between November and April, generally, falls on frozen ground, which is 100% impervious. All runoff between November and April, including snowmelt, generally, occurs on frozen ground, which is 100% impervious. The highest sustained peak flows occur, generally, in the spring of the year, when the winter's accumulation of snow and the early spring rains run off over frozen ground. One of the worst conditions for erosion is during "Mud Season" when the conditions are a top layer of saturated soil over a deeper layer of frozen ground. In Bangor, over the past 8 years, 42% of the annual precipitation has occurred between November and April, when the ground is, generally, 100% impervious.

So, although man-made impervious areas are indeed a factor for those times of the year when the ground is not frozen, it is misleading to say that all of the high flow conditions, or even the worst high flow conditions, are a result of these man-made impervious surfaces.

17. PAGE 9 Stressor 4 –Elevated Water Temperature.

    It is acknowledged that this is an issue. We believe that current BMP technologies can readily address the issue.

    Is there data available on temperature readings of the Kenduskeag Stream just upstream of where Birch Stream enters? This might be useful for comparison purposes.

18. PAGE 9 Stressor 5 –Elevated Nutrient Levels.

    The City reserves comment on this stressor, pending more thorough study and review of the appropriate EPA document for Ecoregion VIII Nutrient criteria for Rivers and Streams.

    Was any evaluation conducted regarding the contribution of the beaver colony to the elevated nutrient levels?

    Is there data available on nutrient readings of the Kenduskeag Stream just upstream of where Birch Stream enters? This might be useful for comparison purposes.

19. PAGE 12 SECTION 4 TOTAL MAXIMUM DAILY LOAD (TMDL) TARGET

    It is noted that the narrative in this section relies predominantly on a 2004 TMDL **Pilot Project** undertaken by ENSR. Is it correct for Bangor to interpret that there are no actual applications with full-scale results available?

- Is this Pilot TMDL the only "Wet Weather TMDL" that has ever been undertaken?

- Are the recommendations contained in this document solely based on this Pilot Project?

- Was this Pilot Project undertaken in an area similar to Bangor in size and climate? In a watershed comparable to Birch Stream?

20. PAGE 12 IMPLEMENTATION RECOMMENDATIONS

    The City agrees in principle with the four-bullet Adaptive Management approach with the stated goal of having Birch Stream meet applicable water quality criteria.

- Implement BMPs strategically through a phased program which focuses on getting the most reductions, for least cost, in sensitive areas first (for example, begin with habitat and riparian buffer restoration, flood plain recovery, and treatment of smaller, more frequent storms);

- Monitor ambient water quality to assess stream improvement;

- Compare monitoring results to water quality standards (aquatic life criteria);

- Continue BMP implementation in a phased manner until water quality standards are attained.

The Adaptive Management approach is the accepted method of addressing Urban Wet Weather Issues, and allows the application of sound science, tangible benefits, and cost-benefit analysis as a basis for activities on urban wet weather projects**.**

Having long known this as being the appropriate and accepted approach to addressing Urban Wet Weather issues, the City has already undertaken an extensive mapping project in the Birch Stream watershed as part of Bangor's Storm Water Phase II Management Program. There is a significant storm water / sanitary sewer infrastructure in this drainage area. Much of the Airport Infrastructure was constructed by the military, and records are vague or non-existent. The mapping project is intended to give the City accurate records and to be a tool and foundation upon which to base future appropriate Best Management Practices (BMPs).

The mapping project is approximately 70% completed at this time. The City considers this project second in priority of actions to be taken. (the Deicing Control Program is first).

The City's Adaptive Management Program to address water quality issues in Birch Stream will be prepared when the mapping project has been completed.

21. PAGE 13 Target of 8% impervious cover (IC)

As previously mentioned, the statement "<u>This TMDL sets a</u> <u>Target of 8% impervious cover (IC)</u>. creates confusion and misunderstanding with the statement <u>"The goal of this TMDL is to have Birch Stream meet applicable water quality criteria".</u>

The use of 8% as a target impervious area is impractical and unattainable in a highly developed urban watershed. This is particularly true for small watershed containing a major airport. (For comparative purposes, a typical residential neighborhood of quarter-acre lots in an urbanized area has an impervious area approaching 20%).

22. PAGE 13 Summary Paragraph

The Summary Paragraph on page 13 refers to the Adaptive Management approach and is, in principal, acceptable to the City.

The Summary Paragraph suggests that the City develop implementation recommendations by the end of 2006. Elsewhere in the document is a reference to a 10-year implementation period, ending in 2015. Why is this the sole responsibility of the City?

The City and ANG have already undertaken several major projects to address the deicing fluid runoff issue. This is expected to be completed in 2006.

The City has also undertaken a significant mapping project of the Birch Stream watershed. This is also expected to be completed in 2006.

The City believes that the development of an implementation plan for additional remediation of Birch Stream cannot and should not proceed until these two programs (or activities) have been completed and evaluated.

Furthermore, before a specific implementation program can be prepared, there needs to be a “Scope of Work” developed that outlines and prioritizes the appropriate BMPs to be utilized.

Therefore, it is premature for the City to commit to a specific date for the development of a remediation plan at this time.

23. PAGE 14 General Stream Restoration Techniques

The City acknowledges this list of BMPs. There are many other BMPs that Bangor is aware of and/or is implementing within the City in conjunction with the Combined Sewer Overflow Control Program.

A few things need to be recognized in regard to the subject:

- Most of Birch Stream flows through private property, and any BMP activity adjacent to or within Birch Stream will require permission of and/or participation by private interests.

- Some portion of the developed watershed upstream of the box culvert outfall is owned or operated by private interests, and any BMP activity will require permission of and/or participation by private interests.

- Education and Training is already an implemented BMP.

- Application of winter sand on roads, parking lots, and runways is driven by safety considerations, not water quality concerns. There already are sweeping and catch basin cleaning programs in place.

- A sewer system evaluation is already being implemented. It is not clear when the sewer odors were observed. The City has replaced several vented manhole covers (the most likely source of odors) with solid covers. There are other sewer system vents that must remain for proper sewer system operation.
- The City questions that documented spills actually relate to water quality impairments of Birch Stream. Most documented spills are of a few gallons in quantity and are addressed immediately at the source, never leaving Airport property or reaching Birch Stream.

24. PAGE 15 Disconnection of Impervious Surfaces

    We believe that this is better described as **"Mitigation of Impervious Surface Discharge"**. The City acknowledges this list of BMPs. There are many other BMPs that Bangor is aware of and/or is implementing within the City in conjunction with the Combined Sewer Overflow Control Program.

25. PAGE 16 Conversion of Impervious Surfaces.

    The City will **NOT** accept widespread conversion of impervious surfaces as a goal of this TMDL Program. In fact this is **not** the goal-the stated goal is to meet applicable water quality standards.

    It is acknowledged that there may be selected locations where this is appropriate on a limited basis. Significant conversion of impervious surfaces is simply impractical in urban watersheds.

26. PAGE 16 Retention Ponds

    Please provide data to substantiate allegations that the detention ponds may be inadequate. Also define any inadequacies that may be substantiated. It should be noted that ponds have been constructed to applicable standards and requirements. Any substantiated inadequacies are not due to negligence or irresponsibility, but rather, reflective to the historical lack of knowledge and understanding of stormwater impacts – particularly in urban watersheds.

27. PAGE 17 Monitoring Plan

There is a significant amount of monitoring being undertaken by numerous parties in the Birch Stream watershed. Sharing of monitoring results is expected.

Will there be a commitment by DEP to undertake annual or semi-annual monitoring to determine progress / compliance?

The reference to a mandated reduction of impervious cover to 8% is **not** acceptable. Again, unrealistic and unattainable.

28. PAGE 20 Impervious cover method

It is not clear why so much emphasis was placed on the Impervious Cover (IC) Method that was used for this TMDL.

Uniform consideration of stormwater impacts based on surface area alone is inaccurate. Factors such as uncontrolled vs. controlled discharge, location of impervious areas within the watershed, and use and activity all have significant importance to water quality impacts. This needs to be acknowledged in the document.

- It is unclear why 8% impervious cover is used. If this method were applied to a subdivision of one-acre houselots, 8% impervious cover would barely cover the paved roads – no houses or driveways!!!! One-acre houselots are generally NOT considered urban. As previously mentioned, urban residential neighborhoods will approach a 20% impervious cover.

- "Results are not appropriate for use in a permitting, enforcement, or monitoring context". (Pages 20 and 24.

- Some portion of the IC analysis was based on only "one data point from Birch Stream". Basing anything on just one data point is unsound.

- There is no mention of how the IC method addresses frozen / saturated ground, which is 100% impervious.

- There are five stressors listed for Birch Stream (Page 10,Table 2). Yet the IC method only addresses the "Elevated Nutrient Levels", assigned a "Medium" level of importance.

- The IC method addresses "Stormwater Runoff".(Page 25). It does not address Stressor #3 "High Peak flows".

CONCLUSION

We understand that following the end of the Public Comment Period on September 29, the Birch Stream TMDL will be revised to incorporate stakeholder comments. The revised Birch Stream TMDL will then be sent to stakeholders, allowing a few days for final review and comment. The document will then be sent to EPA, probably in mid-October.

It was agreed that the stakeholders should meet again in mid-November to begin discussions regarding the implementation process.

The City of Bangor is very supportive of improving water quality in Birch Stream and committed to working cooperatively to achieve this. Our comments are focused on improving the final TMDL document to develop a practical approach with attainable objectives that will be successful in meeting the goal.

Respectfully submitted,

John L. Murphy, P.E.

Assistant City Engineer
207-992-4247
john.murphy@bgrme.org

December ~~14~~28, 2005

John Murphy
Assistant City Engineer
City of Bangor
73 Harlow Street
Bangor, Maine 04401

RE: Response to City of Bangor Review Comments on Birch Stream Draft TMDL

Dear John,

Thank you for providing substantive, thoughtful comments that will help strengthen the final draft of the Birch Stream TMDL. I will address each comment (in italics) from your original submittal and will include ~~the~~ both the comments and the response as an Appendix in the TMDL.

GENERAL COMMENTS

~~1.~~5. The ultimate purpose of this document is unclear. Please clarify the ultimate intent in terms of what the document will be used for and how – guidance? Voluntary compliance? Regulation and enforcement?

*The ultimate intent is to provide information and guidance towards rest oring the stream to meet Maine's water quality standards. The recommendations listed in the TMDL are not mandatory in and of themselves. However, where recommendations pertain to activities that are regulated under the MEPDES Stormwater program, through either the Municipal Separate Storm Sewer System (MS4) or industrial discharge (Multi-Sector) requirements, then the Department may revoke authorization for a discharge under either the MS4 or Multi-Sector General Permit, unless the discharge is found to be consistent with the TMDL. In other words, the Department may mandate changes in operations in order for the general permit to stay in effect. Or the Department may require an individual permit in place of the general permit.~~Non-point Source TMDL's are generally implemented on a voluntary basis, since NPDES permits apply to point source discharges or loads. Maine's recently adopted Stormwater Rules may provide a mechanism to enforce the TMDL recommendations in the Birch Stream watershed, since stormwater runoff is now classified as a point source discharge in USEPA mapped areas of MS4 communities. Since the rules are new, Maine~~

~~DEP's regulatory process for enforcement of the Birch Stream TMDL is presently unresolved.~~ In addition, after the TMDL is approved, the Maine Stormwater Management Law includes a provision whereby the Department, through rule-making, may regulate existing stormwater discharges that are found to be causing or contributing to the impairment. The Department would prefer, however, to see existing sources addressed through development and implementation of a watershed management plan.

~~2.~~6. There are a significant number of stakeholders in the Birch Stream watershed, yet it appears that only a very few have been responsive to the review process. For some reason, the "Public Participation" process appears to have been very incomplete at best.

~~Unfortunately, t~~The TMDL "Public Participation" process ~~does~~has not inspired widespread community response. However, Birch Stream actually received more participation than any other Non-point Source Stream TMDL to date. The Bangor Daily News also highlighted the Birch Stream TMDL and the need for comments in an article and we still received little public response. We welcome any ideas or experience you have that could improve public participation and can be accomplished relatively simply.

~~3.~~7. There appears to be an urgency to the Birch Stream TMDL process that we do not understand. (We were first informed of an October deadline at the September 26 meeting). Because of this "urgency", there has been inadequate time for all stakeholders to make meaningful contributions to the process. The goal of improving water quality is much better served by developing the document carefully rather than quickly.

Your point is noted and DEP has extended the deadlines, the revised deadline is January 31, 2006. ~~Have we set a new deadline?~~ **[DTW1]**

~~4.~~8. The implementation process beyond this document is not clear. Our questions include:

- Who are the Stakeholders?
- What is stakeholder liability?
- What are the monitoring and enforcement mechanisms?
- Who makes decisions?
- Will there be required implementation projects?
- Who pays?

The implementation process and information is presented to provide potential ideas that could be voluntarily put into action or used as a stimulus for development of a watershed management plan. Technically, the implementation plan is not an USEPA required element of the TMDL, so while ~~all~~ these are all

good questions, they are outside of the scope of the TMDL and ~~could best~~need to be addressed through a further watershed planning process.

~~5.~~29. There are references to testing to determine progress / compliance. Does "compliance" mean attainment of applicable water quality standards? Will there be a commitment from DEP to do annual or semi-annual testing of Birch Stream for this purpose?

Does "compliance" mean attainment of applicable water quality standards?
Yes
Will there be a commitment from DEP to do annual or semi-annual testing of Birch Stream for this purpose?
No, the test will be adaptive, based on need. The need will be defined as either a discharge ~~catastrophic~~ event [DTW2]or implementation of significant BMP's.

~~6.~~30. The draft TMDL is not clear on the goal of the program. This was clarified at the September 26 meeting, but we wish to include it here for the record.

It is understood that the goal of this TMDL is as stated on Page 12,

"The goal of this TMDL is to have Birch Stream meet applicable water quality criteria".

It is further understood that the statement made on page 13, which states:

"This TMDL sets a target of 8% impervious cover (IC)".

is not the goal and should be deleted or reworded to clearly state that fact.

The goal of every TMDL is attainment of water quality standards (as required by the Clean Water Act), while the TMDL target is a separate issue and required element. Quantitative targets are generally required in TMDL's and the 8% IC is the target in this TMDL[DTW3]. Wording to this effect has been added to the document, on pg 12. Although the 8% target is a required element, it is also intended to provide guidance for BMP implementation and it is possible that water quality standards to be reached before the 8% target is attained. Once water quality standards are attained, then BMP implementation on existing development in the watershed would be complete.

~~7.~~31. The City recommends using this Document to clearly identify and define Birch Stream as follows:

Birch Stream begins at the outfall of the box culvert that traverses under Airport Mall, and flows as a more or less natural stream to the Kenduskeag Stream.

Upstream of the box culvert outfall is a composition of man-made facilities that comprises a Municipal Separate Storm Sewer System (MS4) as defined by MEDEP in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems, as follows:

"Municipal separate storm sewer system" or ("MS4") means conveyances for stormwater, including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels or storm drains (other than publicly owned treatment works and combined sewers) owned or operated by any municipality, sewer or sewage district, fire district, State agency or Federal agency or other public entity that discharges directly to surface waters of the State."

The stream proper has been defined as requested on pg 5, paragraph 1. What value does the further definition of stormwater conveyances add to the TMDL? ~~Please make a compelling argument to add your suggested language.~~

~~8.~~32. We request that the following statements be added: (somewhere) "Birch Stream has a length of .5 miles. There are a total of 737 miles of impaired (non-attainment) streams in Maine."

Added to the 'Impaired Stream Segment' section, pg 7, paragraph 1.

~~9.~~33. With the recent adoption of the "Non-Stormwater Discharge" Ordinance by the City of Bangor, the City has established local regulatory authority and control over discharges to its storm drain system. A clear definition of the point that separates "Birch Stream" from the City's "Municipal Storm Sewer System" (MS4) will make future efforts to reduce impairments more practical to implement.

The natural stream considered for restoration under the TMDL is clearly defined on pg 5, paragraph 1. The defined impaired segment will be the only section of stream considered for restoration under this TMDL.

~~10.~~34. It is not clear why this stream is Class B.

For the past 50 years, it has been primarily the drainage ditch connecting the Airport Complex to the Kenduskeag Stream.

Other than a short stretch at the lower end, the entire stream flows through private property. There is no public access and no public benefit.

"Class B waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired."

Birch Stream will never be used for drinking water, and is probably too shallow and too narrow to be used for recreational fishing or boating. It is not used for industrial process and cooling water, and is not used to generate hydroelectric power. Birch Stream might possibly support Brook Trout below the waterfall. Designated Uses are the basis of water quality criteria to support those uses, but there appears to be no defined designated use in Birch Stream to warrant class B.

The TMDL is not the proper forum to challenge the classification of Birch Stream. At this time the only way to legally downgrade the classification of Birch is through the Use Attainability Analysis (UAA) process, which requires all potential restoration efforts be completed before the stream can be reclassified as 'C'. This essentially means that the TMDL must be completely implemented before reclassification can be considered. Once the TMDL has been implemented through a comprehensive watershed management strategy, then reclassification may be an option worth pursuing.

~~11.~~35. It should be noted that Bangor and the Airport Entities have already been very active in addressing the Birch Stream impairment issues.

- In November of 2003, a major cleanup of Birch Stream was undertaken. Over five tons of trash and debris were removed from the short section of stream directly behind Airport Mall. (This five tons of trash are unrelated to impervious area).
- There have been four major very expensive Deicing Fluid Runoff Control Projects undertaken by the commercial and military entities at the Airport, which are expected to address the major stressor of concern.

- The City has embarked on a significant mapping project to locate and identify all sanitary sewer and storm drain facilities within the Birch Stream watershed. This mapping is fundamental to all other BMPs to be undertaken.

- A considerable amount of sampling has been done by several parties to monitor the health of Birch Stream.

- An educational and outreach program has been implemented to raise awareness of stormwater issues.

- Several BMPs have been implemented, including employee training.

All these efforts are valuable contributions towards the incremental restoration of Birch Stream and ~~will~~ should be ~~incorporated by~~incorporated by the City of Bangor into a ~~the~~ watershed ~~planning process~~management plan.

~~12.~~36. It should be noted that data and testing that identifies impairment of Birch Stream is all very recent. Given the historical uses and activities in the watershed over the past 50 years, it is highly likely that impairment has existed for a very long time.

Good point;~~,~~ it has been added to the 'Description of Impairments' on pg 8 .

SPECIFIC COMMENTS

~~13.~~37. PAGE 7 Description of Impairments

Reference is made to tests conducted in 1997 and 1999, and the statement that airport deicing runoff is connected to the impairment of Birch Stream. During the 1997 and 1999 timeframes, deicing fluid use was below the 100,000 gallon threshold and was essentially a permitted discharge under the Airport NPDES Permit,

~~14.~~38. PAGE 8 Stressors of Concern

Reference is made to the document "Urban Streams Non Point Source Assessments in Maine" or "Urban Streams Project, PETE/MDEP, 2005). When this document was distributed to stakeholders in the Birch Stream Watershed, , it was not made clear that this was part of an "urgent" TMDL project with short-term deadlines and potential long term implications to stakeholders.

The urgency point has been address previously. All TMDLs have the potential for long term implications to stakeholders. Restoring water quality in impaired waters is generally a challenging undertaking and Birch Stream is no exception.

~~15.~~39. PAGE 8 Stressor 1 – Propylene Glycol.

It should be noted that testing done by the Airport since 11/23/03 does not support the allegation that Propylene Glycol is currently a significant stressor of Birch Stream.

It should be further noted that the capital investments ($3 Million +++) that have been made by both the commercial and military entities at the airport on deicing runoff capture and treatment will insure that Propylene Glycol will not be a stressor in the future.

The TMDL needs to acknowledge the past problems that resulted from Propylene Glycol discharges to the stream. Detection of Propylene Glycol is one type of measurement, but the cumulative environmental effect of past discharges on sediments, biological oxygen demand and aquatic life may persist well past the detectable levels of the chemical in the stream. I have not actually seen the data that completely substantiates the claim that Propylene Glycol is no longer a significant stressor.

The effects of Propylene Glycol in the stream are an extreme concern for many of the community residents and the TMDL needs to acknowledge the role of ~~the~~ chemicals in stream health. Community residents continue to detect the odor of Propylene Glycol emanating from the stream and this may be an indication that the chemical is sequestered in the sediments and periodically released. Additionally, residents detected and reported a discharge or spill to the stream sometime around ~~within the past 10 days of~~ December 12~~4~~, 2005, which means that Propylene Glycol continues to be a significant stressor of concern.

The statement about capital improvements has been added to the end of the 'Implementation' section on pg 16.

~~16.~~40. PAGE 9 Stressor 3 – High Peak Flows.

We question that high peak flows caused by impervious area is a stressor. According to a former property owner adjacent to Birch Stream, the erosion below Ohio Street was caused primarily by a stream alteration resulting from filled land.

Furthermore, there needs to be more discussion regarding the listing of high percentage of impervious surfaces as a likely source, or the reduction of impervious area as a likely solution. By casually mentioning a high percentage of paved / roofed surfaces (33%) is somewhat misleading both here and elsewhere in the document.

This number also does not take into account the airport retention dam, which actually restricts flow to the stream during peak flow periods. This restriction eliminates the largest % of IC from even being a factor in the flow rate.

In Maine, we have frozen ground for 5-6 months of the year. All precipitation that occurs between November and April, generally, falls on frozen ground, which is 100% impervious. All runoff between November and April, including

snowmelt, generally, occurs on frozen ground, which is 100% impervious. The highest sustained peak flows occur, generally, in the spring of the year, when the winter's accumulation of snow and the early spring rains run off over frozen ground. One of the worst conditions for erosion is during "Mud Season" when the conditions are a top layer of saturated soil over a deeper layer of frozen ground. In Bangor, over the past 8 years, 42% of the annual precipitation has occurred between November and April, when the ground is, generally, 100% impervious.

So, although man-made impervious areas are indeed a factor for those times of the year when the ground is not frozen, it is misleading to say that all of the high flow conditions, or even the worst high flow conditions, are a result of these man-made impervious surfaces.

The TMDL's contention that impervious surface is a stressor is based on peer reviewed literature and an extensive Stressor Identification process undertaken by a combination of Maine's water quality professionals and nationally recognized experts. The literature and evidence reviewed as part of the Stressor ID created a compelling case that impervious surface is the best surrogate for the array of chemical and hydrological stressors associated with alterations typical of the urban landscape. To change the use of impervious surface as the basis of the TMDL, the City of Bangor would need to create an equally compelling case that impervious surface is not responsible for the array of observed impacts.

It is likely true that filling land caused some of the observed stream alterations, but this does not negate the effects of upstream hydrological impacts. Frozen ground is highly impervious, but snow covering frozen ground has enormous absorptive capacity and has the capability for direct evapotranspiration. Snow cover and frozen conditions mean the hydrologic cycle is more complex than the~~, so the~~ statement~~suggestion~~ that the watershed is 100% impervious for 5- 6 months of the year implies. ~~is unsubstantiated.~~

~~17.~~41. PAGE 9 Stressor 4 –Elevated Water Temperature.

It is acknowledged that this is an issue. We believe that current BMP technologies can readily address the issue.

Is there data available on temperature readings of the Kenduskeag Stream just upstream of where Birch Stream enters? This might be useful for comparison purposes.

This ~~would be~~ is something that should be considered ~~to look at~~ during the restoration phase.

~~18.~~42. PAGE 9 Stressor 5 –Elevated Nutrient Levels.

The City reserves comment on this stressor, pending more thorough study and review of the appropriate EPA document for Ecoregion VIII Nutrient criteria for Rivers and Streams.

Was any evaluation conducted regarding the contribution of the beaver colony to the elevated nutrient levels?

Is there data available on nutrient readings of the Kenduskeag Stream just upstream of where Birch Stream enters? This might be useful for comparison purposes.

Was any evaluation conducted regarding the contribution of the beaver colony to the elevated nutrient levels?

Not specifically, but the elevated nutrient level is ~~are~~ another urban stressor that should be addressed as watershed wide BMP measures are designed and implemented. Assigning beavers as the source of the nutrients will likely have little effect on the design and implementation of BMPs.

Is there data available on nutrient readings of the Kenduskeag Stream just upstream of where Birch Stream enters? This might be useful for comparison purposes.

This ~~would be~~is something that should be considered~~to look at~~ during the restoration phase.

~~19.~~43. PAGE 12 SECTION 4 TOTAL MAXIMUM DAILY LOAD (TMDL) TARGET

It is noted that the narrative in this section relies predominantly on a 2004 TMDL **Pilot Project** undertaken by ENSR. Is it correct for Bangor to interpret that there are no actual applications with full-scale results available?

- Is this Pilot TMDL the only "Wet Weather TMDL" that has ever been undertaken?
- Are the recommendations contained in this document solely based on this Pilot Project?
- Was this Pilot Project undertaken in an area similar to Bangor in size and climate? In a watershed comparable to Birch Stream?

This is one of the first TMDLs to be submitted to the USEPA applying the 'percent impervious cover (% IC)' method, but it is a well documented and researched approach. Alternative modeling approaches do exist, but they are usually more costly and time consuming to develop. The implementation recommendations of other modeling approaches would not be any different from the recommendations of the '% IC' method. We could have written a TMDL based on specific metals in-stream limits that would very difficult to attain as well and did not adequately address the cause. The result of an urban metals TMDL might be to place end of pipe metals and nutrient limits on every stormwater pipe. Maine DEP chose the '% IC ' method as way to expedite the TMDL modeling phase and move quickly into the implementation phase. Our goal is to find an effective and efficient mechanism to fix the stream.

As concerns the 'Pilot Project' designation, this is an innovative approach that will restore the stream. ~~and few, if any better alternatives exist.~~ This is based on the research and experience of the Center for Watershed Protection, so it incorporates tested low impact methods, that had not been previously used in the TMDL format. This approach uses the best known methods to solve the problems identified in Birch Stream.

~~20.~~44. PAGE 12 IMPLEMENTATION RECOMMENDATIONS

The City agrees in principle with the four-bullet Adaptive Management approach with the stated goal of having Birch Stream meet applicable water quality criteria.

- Implement BMPs strategically through a phased program which focuses on getting the most reductions, for least cost, in sensitive areas first (for example, begin with habitat and riparian buffer restoration, flood plain recovery, and treatment of smaller, more frequent storms);
- Monitor ambient water quality to assess stream improvement;
- Compare monitoring results to water quality standards (aquatic life criteria);
- Continue BMP implementation in a phased manner until water quality standards are attained.

The Adaptive Management approach is the accepted method of addressing Urban Wet Weather Issues, and allows the application of sound science, tangible benefits, and cost-benefit analysis as a basis for activities on urban wet weather projects.

Having long known this as being the appropriate and accepted approach to addressing Urban Wet Weather issues, the City has already undertaken an

extensive mapping project in the Birch Stream watershed as part of Bangor's Storm Water Phase II Management Program. There is a significant storm water / sanitary sewer infrastructure in this drainage area. Much of the Airport Infrastructure was constructed by the military, and records are vague or non-existent. The mapping project is intended to give the City accurate records and to be a tool and foundation upon which to base future appropriate Best Management Practices (BMPs).

The mapping project is approximately 70% completed at this time. The City considers this project second in priority of actions to be taken. (the Deicing Control Program is first).

The City's Adaptive Management Program to address water quality issues in Birch Stream will be prepared when the mapping project has been completed.

This information will be invaluable for the implementation and watershed management phase of the project.

~~21.~~45. PAGE 13 Target of 8% impervious cover (IC)

As previously mentioned, the statement "This TMDL sets a Target of 8% impervious cover (IC). creates confusion and misunderstanding with the statement "The goal of this TMDL is to have Birch Stream meet applicable water quality criteria".

The use of 8% as a target impervious area is impractical and unattainable in a highly developed urban watershed. This is particularly true for small watershed containing a major airport. (For comparative purposes, a typical residential neighborhood of quarter-acre lots in an urbanized area has an impervious area approaching 20%).

The TMDL must demonstrate that the target will insure attainment of water quality standards; otherwise the TMDL will not meet the legal requirements of the Clean Water Act. The use of 8% as the target is based on information that correlates attainment of Class B aquatic life standards with impervious surface in Maine watersheds. ~~I know that~~While 8% may seem~~s~~ impossible to attain in a highly developed watershed, ~~but~~ through the implementation of well designed BMP's the impact of the impervious surface can reduced to levels approaching 8%. The target can also be viewed as setting a hydrograph target in the impaired stream segment that would approximate an 8% developed watershed. This work has been done in other urban watersheds and by using an adaptive approach to~~we~~ implement BMPs overtime, Birch can achieve ~~until the~~ Class B aquatic life ~~meets~~ ~~Class B~~ standards.

~~22.~~46. PAGE 13 Summary Paragraph

The Summary Paragraph on page 13 refers to the Adaptive Management approach and is, in principal, acceptable to the City.

The Summary Paragraph suggests that the City develop implementation recommendations by the end of 2006. Elsewhere in the document is a reference to a 10-year implementation period, ending in 2015. Why is this the sole responsibility of the City?

The City and ANG have already undertaken several major projects to address the deicing fluid runoff issue. This is expected to be completed in 2006.

The City has also undertaken a significant mapping project of the Birch Stream watershed. This is also expected to be completed in 2006.

The City believes that the development of an implementation plan for additional remediation of Birch Stream cannot and should not proceed until these two programs (or activities) have been completed and evaluated.

Furthermore, before a specific implementation program can be prepared, there needs to be a "Scope of Work" developed that outlines and prioritizes the appropriate BMPs to be utilized.

Therefore, it is premature for the City to commit to a specific date for the development of a remediation plan at this time.

Why is this the sole responsibility of the City?
It is not in a legal sense, but given the City's large ownership in the watershed, ~~it seems logical you would take the lead~~and its status as a regulated MS4 with a industrial discharge regulated by MEPDES, it clearly needs to take a leadership role.

Completing the 2 projects in 2006 would be great, but this doesn't preclude many aspects of developing a watershed management plan, like working on the scope and increasing the participation of watershed stakeholders.

~~23.~~47. PAGE 14 General Stream Restoration Techniques

The City acknowledges this list of BMPs. There are many other BMPs that Bangor is aware of and/or is implementing within the City in conjunction with the Combined Sewer Overflow Control Program.

A few things need to be recognized in regard to the subject:

- Most of Birch Stream flows through private property, and any BMP activity adjacent to or within Birch Stream will require permission of and/or participation by private interests.

- Some portion of the developed watershed upstream of the box culvert outfall is owned or operated by private interests, and any BMP activity will require permission of and/or participation by private interests.

- Education and Training is already an implemented BMP.

- Application of winter sand on roads, parking lots, and runways is driven by safety considerations, not water quality concerns. There already are sweeping and catch basin cleaning programs in place.

- A sewer system evaluation is already being implemented. It is not clear when the sewer odors were observed. The City has replaced several vented manhole covers (the most likely source of odors) with solid covers. There are other sewer system vents that must remain for proper sewer system operation.
- The City questions that documented spills actually relate to water quality impairments of Birch Stream. Most documented spills are of a few gallons in quantity and are addressed immediately at the source, never leaving Airport property or reaching Birch Stream.

Most of these items pertain to the implementation phase of the project. The documented spills were considered as a major stressor, but there may be a cumulative effect of few gallons spilled frequently. After many years these spills may reach the stream via groundwater discharge and minimizing the occurrence of spills is reasonable protective action.

~~24.~~48. PAGE 15 Disconnection of Impervious Surfaces

We believe that this is better described as **"Mitigation of Impervious Surface Discharge"**. The City acknowledges this list of BMPs. There are many other BMPs that Bangor is aware of and/or is implementing within the City in conjunction with the Combined Sewer Overflow Control Program.

The wording was changed.

~~25.~~49. PAGE 16 Conversion of Impervious Surfaces.

The City will **NOT** accept widespread conversion of impervious surfaces as a goal of this TMDL Program. In fact this is **not** the goal-the stated goal is to meet applicable water quality standards.

It is acknowledged that there may be selected locations where this is appropriate on a limited basis. Significant conversion of impervious surfaces is simply impractical in urban watersheds.

These BMP's are only suggestions to consider in the development of a watershed management plan. They are not requirements of the TMDL.

~~26.~~50. PAGE 16 Retention Ponds

Please provide data to substantiate allegations that the detention ponds may be inadequate. Also define any inadequacies that may be substantiated. It should be noted that ponds have been constructed to applicable standards and requirements. Any substantiated inadequacies are not due to negligence or irresponsibility, but rather, reflective to the historical lack of knowledge and understanding of stormwater impacts – particularly in urban watersheds.

These ~~allegations~~statements are based on professional judgment using the current engineering practices. We acknowledge that the existing ponds were developed based on the standards at the time of permitting and are in compliance.

~~27.~~51. PAGE 17 Monitoring Plan

There is a significant amount of monitoring being undertaken by numerous parties in the Birch Stream watershed. Sharing of monitoring results is expected.

Will there be a commitment by DEP to undertake annual or semi-annual monitoring to determine progress / compliance?

The reference to a mandated reduction of impervious cover to 8% is **not** acceptable. Again, unrealistic and unattainable.

The monitoring commitments have already been addressed and remediating the watershed to meet an effective 8% runoff target or attainment of aquatic life standards. The TMDL basically requests that progress be made towards those goals with periodic retesting for compliance. DEP expects the water quality goals will achieved before the 8% target is reached.

~~28.~~52. PAGE 20 Impervious cover method

It is not clear why so much emphasis was placed on the Impervious Cover (IC) Method that was used for this TMDL.

Uniform consideration of stormwater impacts based on surface area alone is inaccurate. Factors such as uncontrolled vs. controlled discharge, location of impervious areas within the watershed, and use and activity all have significant importance to water quality impacts. This needs to be acknowledged in the document.

- It is unclear why 8% impervious cover is used. If this method were applied to a subdivision of one-acre houselots, 8% impervious cover would barely cover the paved roads – no houses or driveways!!!! One-acre houselots are generally NOT considered urban. As previously mentioned, urban residential neighborhoods will approach a 20% impervious cover.

- "Results are not appropriate for use in a permitting, enforcement, or monitoring context". (Pages 20 and 24.

- Some portion of the IC analysis was based on only "one data point from Birch Stream". Basing anything on just one data point is unsound.

- There is no mention of how the IC method addresses frozen / saturated ground, which is 100% impervious.

- There are five stressors listed for Birch Stream (Page 10,Table 2). Yet the IC method only addresses the "Elevated Nutrient Levels", assigned a "Medium" level of importance.

- The IC method addresses "Stormwater Runoff".(Page 25). It does not address Stressor #3 "High Peak flows".

Most of these items have been previously addressed and are applicable to the implementation phase.

~~process.~~

I hope my response and revisions to the document have clarified your knowledge of the TMDL and the way water quality restoration is viewed through the provisions of the Clean Water Act.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine DEP

Cc:
Don Witherill, DEP

MaryEllen Dennis, DEP
Jeff Dennis, DEP

September 28, 2005

Submitted by:
Ann Birmingham on behalf of Griffin Park Citizens Against Toxic Streams (CATS)
194 Griffin Park #404, Bangor, Maine 04401
207-990-5195

Griffin Park is an income sensitive housing for 50 families, all but a few apartments with children. Griffin Park is owned by the City of Bangor, and is run by Bangor Housing Authorities. Griffin Park Residents are the BULK of residents living closest to/on Birch Stream's edges. There are only three other families living on Birch Stream and they are privately owned homes, one of which recently sold and another that is up for sale and vacant, as they moved due to the family always being sick when living there. (Ohio St.) Then there are two small businesses (Ohio St.) and one other privately owned home that has a small carburetor business in his garage. (On Griffin Road)
Residents in the 50 apartments here in Griffin Park have been complaining for years that the stream is sick therefore making the residents sick.

Submitted to: Melissa Evers, DEP Environmental Specialist

RE: BIRCH STREAM TOTAL MAXIMUM DAILY LOAD (TMDL) REPORT COMMENTS

1. Propylene Glycol not included as a separate item in this TMDL-it is expected to be a less important stressor from 2005 onwards, therefore not included as a separate item.

   It would be a true injustice to the residents not to include Propylene Glycol as a separate item and consider Propylene Glycol as a stressor of Birch Stream in this TMDL report or any report noting the condition of Birch Stream.

   Propylene Glycol has been the largest pollutant in Birch Stream for decades and although actions have been taken, they have not completely solved the problem of PG not getting into Birch Stream. In fact, Propylene Glycol was in our air at the end of August this year-2005.

   Testing for PG needs to be performed in the winter months, and in the spring months, at various times, times not announced to anyone, and at various stations. We residents have asked for a trustworthy, first response person to contact when we smell the deicer and other chemicals in our air/stream, to come immediately and test Birch Stream, however since residents have started reporting the issues publicly about Birch Stream the smells are late at night or in the very early morning hours now, making any response more difficult.

The airport is looking to expand, and with expansion more deicer is necessary. Is the WWTP able to accommodate the deicer with all the expected increase in traffic at BIA?

Bangor International Airport has been predicted to be the nation's fastest-growing airport according to a recent report from the Boyd Group, and aviation consulting and forecasting firm. (Weekly 5-19-05)

Jet traffic is up from 19% to 96% in just five years, and the busier BIA gets, the more flights and routes they add. (BIA ad in Bangor Daily News)

RECOMMEND- DEP ASSIGN A FIRST RESPONSE PERSON THAT THE RESIDENTS CAN CALL—WHEN THE SMELLS ARE STRONGEST-DAY OR NIGHT OR EARLY MORNING—TO COME AND TEST THE STREAM AT THESE TIMES- TO SEE JUST WHAT IS IN THE STREAM AT THESE TIMES-WHICH WOULD ASSIST IN DETERMINING WHAT IS GOING ON IN BIRCH STREAM-WHICH WOULD BENEFIT BOTH DEP WITH THE REPAIR OF BIRCH STREAM, NOT TO MENTION THE HEALTH/AIR OF THE LOCAL RESIDENTS.

Residents in Griffin Park see Birch Stream every day, we live with it. We could be valuable assets to DEP in documenting what is going on in the stream, if interested.

Propylene Glycol (PG)-(pg. 8 of report) PG input to the steam was much reduced, due to remedial actions in the fall of 2003 by Bangor International Airport (BIA) and Air National Guard (ANG), and it is questionable if both systems are up and running to prevent any PG from going into Birch Stream. Rebecca Hupp, director of the airport has not been clear if the ANG's system is completely diverting the deicer to the WWTP. Air National Guard uses 3 times the amount of deicer than the Airport uses, so it would be very important ANG's system is up and running to full capacity, at all times.

2. Valves-
There was a valve installed in (Nov. 11, 2004 Bangor Daily News) BIA's closed de-icing fluid collection containment system. The tank that will allow for time controlled release of deicing fluid into the City's sewer system, which will reduce the impact of the Waste Water Treatment Plant in times of peak demand.

ANG has a valve to turn to the stream in their de-icer holding tank, and BIA's valve was inadvertently turned to the stream in error by one employee (4-05-2004), so instead of going to the WWTP it went directly to Birch Stream.

CONCERN/QUESTIONS:

What actions will be taken if valves are turned to the stream? Why is the Airport's de-icing fluid collection system holding tank that is closed, being built with a valve to turn to Birch Stream? (BDN 11-11-04)

3. Where does Birch stream originate?
   As discussed at the meeting of September 26, 2005 we agree that it is important that we find out just where this stream begins. Nobody seems to know, and to get all sources to agree to cooperate in the cleanup, we need to know the boundaries and the sources.

4. CLASS B TO CLASS C -BIRCH STREAM
   As discussed at the meeting of Sept. 26, 2005, the City has contemplated on changing Birch Stream from a Class B Stream to a Class C Stream. This would not be in the best interest of the residents/citizens living along the banks of Birch Stream. This steam violates the Clean Water Act, and actually infringes on the Clean Air Act also, so if the City cannot meet the standards of a Class B stream then they should not be looking at how to lower the class, but ask why they can't seem to meet the Class B standards. A Class B would offer the residents in Griffin Park a better chance of cleaner air and environment.

5. TREES AND SHRUBS:
   We question the shrubs and trees recommended to plant along Birch Stream. Trees and shrubs to be planted along the stream should be for beauty, not to hide the smell as was recommended in the early part of our complaints about the fumes originating from Birch Stream.

   If you follow the Pine Tree Line at the airport, the trees will lead you to the sources coming into Birch Stream. To the right of Godfrey Blvd., behind DHS building and behind Unicel is the ANG's and to the left of Godfrey Blvd. behind Burger King on Union Street is both the ANG and BIA's flow into Birch Stream. ANG's flow goes under Godfrey Blvd. and meets up with the one behind Burger King.

   These locations all flow differently at different times. These small contributories flow and smell with or without rain, snow or any drainage, but more so in the late evenings or early mornings. But if you are not sure where to find these locations, just look for the lines of Pine Trees and they will lead you to the flows.

6. BANGOR CITY WORKERS –SALT AND GRAVEL- Off Godfrey Blvd.
   Used, stored and must be releasing into the ground-Birch Stream watershed-Oil, sand, salt. Should be looked into what is stored there and how they use the watershed.

7. EROSION OF PROPERTY-
The area of great erosion in Birch Stream is in the Ohio Street - Scott Thomas's yard/home. I have talked with Scott, and he has had great concern for his property value and the illnesses he and his family have been experiencing. Scott has since put the home up for sale, and moved to another property he owns. Scott was not openly willing to come forward and voice his concern with his children and family being sick, however it is quite understandable—who would want to purchase a home on a polluted-perhaps health hazard stream? Scott was very open about his concerns on how the stream has taken with its rushing waters his land-erosion.

8. NEW DEVELOPMENT AND NEW PARKING AREAS-
Union Street is under major expansion with buildings etc., being built.

BIA is expanding there parking lot and it's a huge project.

Question: These expansions are they being checked to see that they are meeting the impervious recommendations/concerns that you are requesting in the TMDL report?

RECOMMEND:
Any new construction that will add to the Watershed in the Birch Stream area should be scrutinized to make sure it is meeting all necessary requirements at the time of being built. The DEP, City should have a handle on this so that we will not add problems down the road to the already existing problems facing Birch Stream and its contributors.

9. MAPPING OF BIRCH STREAM AREA
John Murphy mentioned at the Sept. 26th, 2005 meeting a few times how the City is putting together a map of the area around Birch Stream and I believe the airport area. This is wonderful. This map will show all pipes including sewerage pipes, like the three large sewer pipes near/in the stream. John Murphy told me the three sewer pipes may need covers so people won't smell the sewer odor that we smelled while standing along the steam talking on 10/11/2003. This map may be very helpful in determining what exactly is in Birch Stream. This steam should not be a "drainage ditch" as John referred to it, especially when it is in Griffin Park's back yard.

10. TESTING- ANY TESTING

Question-will anyone, airport, ANG anyone know when you will test? And if anyone will know, why do they have to know?
How much notice will they be given that you will be testing? Will they know exactly what you will be testing for?

Reason- A big issue we have felt uneasy about here at Griffin Park is-- the polluters of the stream are also doing the testing of the steam. They know when to test-therefore not to release.

We feel release is the word to use. We watch this steam, and the weather, time, etc., and we know what we smell and the volume of that smell. Small runoff type releases into Birch Stream-small smell, large river running in our Birch Stream, little rain, strong smell, ---it's got to be coming from somewhere, and with no rain, no snow and the stream is rushing like a river…it has to be released, to get such pressure in such a small stream at various times…and we know what it has smelled like with the valves inadvertently turned our way-to the stream (.

11. BIRCH STREAM—FROZEN-TESTS
    Birch Stream does not totally freeze-ever, can always access the stream for testing. The largest pollutant that has been in the stream is propylene glycol-a de-icer…which would make it understandable that it does not usually freeze. Behind the Airport Mall does tend to freeze on the top, but it's not a solid freeze, and it is running underneath the ice.

RECOMMEND: Testing at the detention ponds (all of them) -in the steam, all different times, but especially when the smell is outside our homes, in the winter months and in April. April is unbearable to us, and the illnesses in the park are usually very high. We believe the releases are happening more frequently in April due to discarding the excess deicer/holding tanks.

December 22, 2005

Ann Birmingham, Griffin Park Citizens Against Toxic Streams (CATS)
194 Griffin Park #404
Bangor, Maine 04401

RE: BIRCH STREAM TOTAL MAXIMUM DAILY LOAD (TMDL) REPORT COMMENTS

Dear Ms Birmingham,

Thank you for providing comments that will help strengthen the final draft of the Birch Stream TMDL. Please note that much of the stream specific information you provided will be valuable for watershed management planning, but has little bearing on the technical aspects of the TMDL. I will address each comment according to the number assigned in your original submittal and will include both the comments and the response in an Appendix in the TMDL. Including your comments in the TMDL means they will become part of the public record regarding Birch Stream.

1. Propylene glycol is listed as a stressor in the TMDL, because it affects the dissolved oxygen in the stream. The available toxicity literature does not list propylene glycol as toxic to aquatic organisms, but it does effect the streams environmental condition and the suitability of habitat for aquatic organisms. Loading propylene glycol creates an oxygen demand that means the stream does not support a community of aquatic organisms consistent with water quality standards.

   This does not directly address your concerns for the health of nearby residents, but the issue of discharge of propylene glycol into the stream has been identified major problem, beyond the TMDL. Bangor International Airport (BIA) and Air National Guard (ANG), have spent about $3 million to control the problem and there is every indication that they are working to eliminate the discharge. The TMDL attempts to balance the issue by acknowledging the stressor and BIA and ANG's efforts to solve the problem.

   The recommendation is outside of the scope of the TMDL, but is worth pursuing with DEP's Bureau of Remediation in Bangor.

2. The concerns raised about valves are specific operational concerns that may affect the stream in the future. These items could be addressed through the watershed management process. You could also refer your questions directly to the DEP's L&W licensing staff or BIA and ANG.

3. The stream covered by the TMDL has been defined as requested on pg 5, paragraph 1. All activities within the watershed that affect the stream will be considered during the watershed planning process. The headwaters of most

streams begin as small runoff channels that combine to create a stream as the water moves down grade. The headwaters of Birch Stream have been channelized and piped through a series of development projects and the remaining natural channel is identified in the TMDL.

4. The City of Bangor has expressed the desire to change Birch Stream from a Class B to Class C, but does not have the legal authority to change water quality classification. A Use Attainability Analysis (UAA) process is the only way to legally downgrade the classification of Birch, and this must be initiated by DEP and needs to be approved by USEPA. This process requires all potential restoration efforts be completed before the stream can be reclassified as 'C', which means that the TMDL must be completely implemented before reclassification can be considered.

5. The recommendation in the TMDL to plant trees and shrubs is to create a riparian buffer, which treats overland runoff and has positive benefits for water quality.

6. This may warrant further investigation as the watershed management plan proceeds.

7. Erosion is a common consequence of hydrological impacts due to runoff from impervious surfaces. When the land cover is converted from forest and grassland to impenetrable pavement the stormwater that runs to stream increases in volume and frequency. Typically greater stormwater volume causes the banks to erode and changes the channel. Stream channels are dynamic and do change naturally, but stormwater from impervious surfaces has far reaching negative impacts on stream condition.

8. Adding more development and pavement in the watershed is a concern and needs to be addressed in the watershed management plan. New development can be constructed using 'low impact' design criteria and have virtually no noticeable impact on the stream, but you would have to ask the City of Bangor if low impact best management practices (BMP's) are being incorporated into the new development.

9. The mapping effort that the City described is an essential first step to developing a comprehensive management plan and it is my understanding that this is a priority for the City.

10. Monitoring as a result of the TMDL will focus on attainment of applicable water quality standards. DEP will be looking indicators of aquatic health, such as the condition of the macroinvertebrate community or dissolved oxygen. We use the macroinvertebrates as indicators of health because the community integrates environmental conditions over a long period of time, which should avoid the type of potential manipulation you described. DEP will conduct adaptive testing, based

on need, which is defined as either a catastrophic event or implementation of significant BMP's.

11. These testing recommendation are noted and will be considered if DEP conducts further testing for propylene glycol.

Unfortunately, the TMDL is not the proper forum for many of your concerns, but they have been noted and will influence the direction of future watershed planning efforts. Please don't be discouraged, your participation in the process helps to move stream restoration in a positive direction and improve the local environment for residents.

Sincerely,

Melissa Evers
Environmental Specialist III
Maine DEP

26 Sep 2005

MEMORANDUM FOR Maine Department of Environmental Protection

FROM: 101 ARW/EM
99 Glenn Avenue Suite 494
Bangor IAP, ME 04401-3054

SUBJECT: Maine Air National Guard Comments on Birch Stream Total Maximum Daily Load Draft Report Review

1. The Maine Air National Guard (MEANG) appreciates the opportunity to comment directly to the Maine Department of Environmental Protection (MDEP) regarding the Total Maximum Daily Load (TMDL) Draft Report developed by MDEP and their consultants. The MEANG continues to commit to improving water quality conditions in the Birch Stream Watershed and we will continue ongoing strategies to reduce pollutant runoff from our installation.

2. The draft report does not directly state, but does imply the existence of Birch Stream on the southerly side of Union Street. Though MEANG does not contest the idea that head waters historically existed somewhere on the current airport complex; various parties clearly altered the location *prior* to federal or state regulations regarding these types of activities. However, northerly of the Airport Mall MEANG believes Birch Stream is essentially in its natural location. There are at least three airport complex man-made major drainage ways that converge at or near Union Street where they flow under the Airport Mall (from south to north). Thus, on page 5 in the first paragraph of the draft report, we believe it is in the best interest of all concerned to remove location references to Birch Stream southerly of the northerly boundary of the Airport Mall.

3. The “Impervious Cover Method” (IC Method), used to estimate current and target annual volumes and annual pollutant loading from Birch Creek is a highly simplistic method. We feel this method is an overly simplistic approach for this TMDL; however, we agree with the overall implementation effort to identify potential “hot spots” and implement strategically-placed BMPs throughout the watershed. The IC Method approach is limited in that it does not produce accurate quantification of loadings from individually permitted entities and we agree with MDEP’s decision to not translate reductions identified in the TMDL report to permit modifications or limits.

4. MEANG concurs with the draft report’s conclusion that deicer run-off is a less important stressor now and in the future than it was historically. Since December 2003, both the airport and MEANG significantly reduced deicer run-off by capturing deicer and diverting it to the Bangor Wastewater Treatment Plant conveying it through the City sewer system.

5. MEANG does not believe it is viable source for the aluminum, semi-volatiles, and petroleum aromatic hydro carbons detected during November 2003. Soil sampling on the industrial complex in the storm water conveyance system does not even exhibit these characteristics. Sediment and water sampling by both the US EPA and the MEANG during June of 2005 in response to an April 3rd, 2005 petroleum release from an unknown source on the BIA complex resulted in either non-detection or very low detection levels of organics. Sediment and water sampling occurred at locations selected by US EPA officials starting near Union Street and following the storm water conveyance system back to the detention pond on the MEANG base. MEANG and the US EPA furnished the results to the MDEP.

6. Table 2 of the draft indicates documented spills and dumping as “likely sources” of toxic contaminants. “Dumping” is not defined anywhere and leads the reader to believe some sort of illegal activity occurs by particular land users. There is no documented history of toxic dumping in the Birch Stream watershed by MEANG. MEANG closed its Installation Restoration Program

(IRP) actions in the late 1990's. MEANG has an extensive history of cleaning up spills (substantial amounts of reported spills are below 10 gallons) before they've reached the storm water system. Typically, personnel from the Maine DEP or US EPA have been on hand to observe and guide the clean-up of those spills to high standards. In summary MEANG believes it is *unlikely* that spills on its site are a "likely source" of toxic contaminants.

7. MEANG established multiple sampling points to accomplish its NPDES Phase I permit requirements in addition to developing longer term data. During the summer of 2005, MEANG studied its run-off from the base as shown in the table below. NPDES 2 is the point run-off leaves the base at the detention pond by the airport Fire Department. Based on a review of various regulations and studies conducted nationwide, conductivity less than 500 µS/cm appears to be acceptable criteria for urban streams. Semi-weekly measurements made at the discharge point from the MEANG base found during the summer of 2005 indicated an average of 357 µS/cm with a maximum of 490 µS/cm (17 August 2005) and a minimum of 189 µS/cm (25 July 2005).

8. Both MEANG and BIA have site location of development permits and a high degree of control over the volume, duration, and intensity of run-off from their respective sites. Based on calculations by Maine licensed civil engineering consultants, MEANG has excess capacity over required flows during storm events and in fact, reduced flows compared to those in place when Dow Air Force Base was the occupant of the site. Related to flows, the IC method characterizes an impacted stream as:

> "possessing a watershed impervious cover ranging from 11 to 25 percent, and showing clear signs of degradation due to watershed urbanization. The elevated storm flows begin to alter stream geometry. Both erosion and channel widening are clearly evident. Streams banks become unstable, and physical habitat in the stream declines noticeably."

Birch Stream geometry is relatively constant with little or no bank erosion except in the case of the bank just below Ohio Street where the slope changes from relatively flat to steep including a transition to a small waterfall. Radical or constant changes in stream geometry for this site tend to result more from aquatic mammal habitat (i.e. beavers) development and less as a result of storm water run-off. The impact on flow control by wildlife has little or no mention in the draft report but is significant on the ground.

9. In addressing the fourth stressor, elevated water temperature, MEANG also evaluated temperature at NPDES 2. Semi-weekly measurements made at the discharge point from the MEANG base found during the summer of 2005 indicated an average of 17.5º C with a maximum of 21.1º C (15 August 2005) and a minimum of 11.1 ºC (6 June 2005). Sampling generally occurred around 0900 on the date listed. Note that 20º C is equivalent to 68º F which is suitable for cold water species such as Brook Trout.

10. With regard to the sixth stressor, elevated nutrient loading, MEANG does not have data to compare to MDEP data. However, MEANG will begin collecting total phosphorous and total nitrogen data later this year in an effort to more thoroughly analyze the timing and quality of these nutrient loads. However, based on discussions with many engineering consultants, impervious surfaces alone are not typically considered to be significant sources of these nutrients. Typical sources include intensive fertilizer use and lawn care practices along with poor erosion and sedimentation control practices on construction sites. Please more clearly define the degree of concern for phosphorous and nitrogen.

11. Table 4 (page 24) identifies Event Mean Concentration (EMC) values for Total Phosphorus and Total Nitrogen based on a Center for Watershed Protection (CWP) publication from 2003. Numerous EMC values are available in the literature and these values can vary widely depending on such factors as soil type, land use type, the presence or absence of BMPs, percent impervious area, and others. The TMDL report does not specify why the CWP values were chosen, the origin of the study in which the EMC values were calculated, and if the site specific conditions of

that study are similar to the conditions represented in the Birch Stream watershed. Table 4 also identifies a "Table 16" as a source for pollutant concentration information. Please more completely explain Table 16 of the CWP.

12. MEANG supports the MDEP's decision to use annual Total Nitrogen (TN) and Total Phosphorus (TP) Load estimates for descriptive purposes (Page 26, Paragraph 1). Storm flow monitoring on 11/20/03 at Station S312 revealed a TP concentration of 0.084 mg/L. While this single sample is not a full representation of storm flow conditions at this station, which are represented by multiple samples collected over an entire storm event, it is significantly less than the TP EMC value of 0.32 mg/L used to calculate the TMDL. Site specific EMC values may be appropriate if the MDEP anticipates using the EMCs for decisions other than descriptive purposes.

13. The report cites dumping as a likely source of major toxic pollutants. Historic use of Birch Stream as a dumping ground is well documented. Based on conversations at a stakeholder meeting on September 26th at the Maine Department of Environmental Protection, "dumping" apparently refers to the solid waste found during the fall 2003 clean-up. In the fall of 2003, MEANG, BIA, and City employees conducted a stream clean-up removing literally tons of universal and municipal solid waste. The waste included in excess of 200 shopping carts with the names of retailers no longer doing business in the area for in excess of 20 years. Shopping carts, typically coated with chrome as a corrosion inhibitor, cannot help but to undergo corrosion after this many years in an outdoor environment. Also removed were vehicle batteries, furniture, car parts, tires, and other trash. Please modify the TMDL Final Report to reflect use of appropriate technical terms (e.g., municipal solid waste, universal waste) to characterize the waste.

14. The Birch Stream TMDL calls for a watershed-wide 65% reduction in impervious area with a goal of 8% impervious area. It is unclear why Impervious Area is used to set the TMDL target when a significant effort was made to identify site-specific stressors. While a general correlation does exist between impervious area and stream degradation, reducing impervious area by 65% does not ensure biological habitat improvement or stream quality without also reducing stressors. Thus, rather than selecting a target that is likely unachievable and difficult to measure, it may be more appropriate to base the TMDL on parameter(s) which have a known affect on water quality and can be more easily quantified and reduced based on the implementation strategies outlined in Section 5. MEANG will not be able to make significant reductions in the impervious areas at the installation. Most of the implementation strategies outlined in Section 5 targeted reducing pollutant runoff from impervious areas and restoring stream uses and do not contribute toward the TMDL goal of 8% impervious area. Only one strategy, "Conversion of Impervious Surfaces," addresses the TMDL target of eliminating impervious area.

15. On page 8, in paragraph 1, MDEP mentions that a "large amount of biological, chemical, and physical data" was collected during 2003 as part of an effort to gain a better understanding of specific stressors in Birch Stream. This information is relevant to the TMDL and would be valuable to the reader as an appendix to the report. Please also consider including monitoring data used to identify Birch Stream as impaired on the 2002 and 2004 Integrated Water Quality Monitoring and Assessment Reports in an appendix.

16. From the photos, it appears that station S384 (below the Airport Mall) is located in a pool area. Aquatic insects, particularly Ephemeroptera, Plecoptera, Trichoptera (EPT) taxa species used for looking at the "health" of a water body, would likely not survive in a pool habitat given their need for highly oxygenated and mostly flowing waters, regardless of other water quality constituents. In this area, benthic surveys may not be the best or appropriate indicators of aquatic health. Based on the September 26th meeting, the station was in-fact relocated to an appropriate location after beavers stagnated the water at the first location. Please clear this fact up in the final report.

17. In terms of management and mitigation, MEANG wants to cooperate with BIA, the City, regulators, and the general public. MEANG is fully engaged as a partner in the Bangor Area Storm Water Working Group. MEANG has also been working under a NPDES Phase multi-sector general permit for over 5 years with a fully implemented storm water pollution prevention plan. The MEANG environmental manager, in coordination with BIA and City staff would be more than happy to provide valuable information to businesses and residents in the watershed regarding the importance of joint environmental stewardship roles and responsibilities shared by everyone.

D. ERIC JOHNS, LT COL,

MeANG

Environmental Engineer

January 5, 2006

D. ERIC JOHNS, LT COL, MeANG
Environmental Engineer
101 ARW/EM
99 Glenn Avenue Suite 494
Bangor IAP, ME 04401-3054

RE: Response to Maine Air National Guard Comments on Birch Stream Total Maximum Daily Load Draft Report

Dear Eric,

Thank you for providing substantive comments that will help strengthen the final draft of the Birch Stream TMDL. I will address comments based on the numbers listed in your review and both will be included as an Appendix in the TMDL.

GENERAL COMMENTS

1. MEANG's demonstrated commitment to water quality improvement will add value to future watershed management plans on Birch Stream.
2. For the purpose of the TMDL, the stream has been defined on pg 5, paragraph 1, and in Figure 1. It identifies a naturally flowing portion of the stream with an eroded base and meandering channel. It is unclear how this differs from your description, so please provide a marked map to clarify the discrepancy.
3. The Impervious Cover Method (%IC) is simplistic by design since more elaborate modeling approaches are more costly and time consuming to develop. Secondly, the recommended outcome of other modeling approaches would not be any different from the recommendations of the %IC method. MDEP could have written a TMDL based on in-stream metals limits that might place end of pipe metals and nutrient limits on every stormwater pipe. Maine DEP chose the %IC method as way to expedite the TMDL modeling phase and move quickly into the implementation phase. Our goal is to find an effective and efficient mechanism to fix the stream.
4. DEP knows the deicer runoff will be a continuing challenge for MEANG and Bangor International Airport (BIA) and both have demonstrated a commitment to control the problem.
5. Good information since identifying the original source of hydrocarbons is difficult.
6. The 'Dumping' listed in Table 2 is a general concept without pointing to any source in particular.
7. Maine has no specific water quality criteria for conductivity values, but the phrase, 'high conductivity levels', on page 9, refers to comparisons with conductivity levels generally found in Maine streams. Maine streams tend to be 'soft water' and have naturally low conductivity values, below 100 µS/cm, and a value of 500 µS/cm would be considered high in Maine (there are some naturally well buffered, high conductivity streams in Maine, but these are the exception). The average of 357 µS/cm measured on the MEANG base may be the result road salt runoff and associated salt accumulation in ground water. High conductivity levels are generally considered an indicator of unspecified contaminants that may warrant further investigation.

8. First, MEANG and BIA Site Location of Development Permits are designed to address specific projects, but do not address the impervious surfaces that existed before permits were required. This means that excess capacity for permitting purposes is not the same as adequate capacity based on the impacts to the receiving stream. The TMDL describes the need to define BMPs and storage capacity on the scale of the whole watershed. Next, the stream channel was described as having high levels of eroding banks and geomorphic instability in a fluvial geomorphic assessment conducted by the hydrogeomorphologist, John Fields. My observations in 2005 also indicate active sediment transport with on going deposition of fresh sandy material in the streambed. The point about wildlife, referring to beavers, is well taken and is included on pg 5.

9. Instantaneous measures of temperature at 9:00 am are valuable, but do not detect diurnal variation. Daily maximum temperatures that dictate habitat suitability tend to occur in the early evening. Continuous datalogger measurements are the most effective way to detect the daily maximum temperatures, and DEP's dataloggers consistently found temperatures on excess of 25 ºC in August, 2003. BMP's that reduce summer water temperatures should be considered during the watershed planning process.

10. Impervious surface is used as a surrogate for the suite of observed stressors and may be an indirect conduit for any of the stressors. The exact sources of nutrients are not identified in the TMDL, but the impact of nutrient enrichment has been observed through low dissolved oxygen (DO), diurnal DO fluctuations > 2mg/l and the occurrence of macro-algae. The respiration of excess algal communities produce diurnal DO fluctuations that exceed 2 mg/l and the observed algal growth is directly connected to nutrient enrichment in freshwater.

11. The Event Mean Values (EMC) were chosen from a Center for Watershed Protection (CWP) publication by Schueler, that defines the connection between impervious cover and water quality impacts. The methods used in the TMDL are based on the report 'Draft Pilot TMDL Applications Using the Impervious Cover Method', produced by engineering firm ENSR, under contact to USEPA. The term 'Table 16' will be eliminated, since it is simply a reference to EMC literature values. The 'C' value in the 'Annual Pollutant Load' equation could be derived from literature or observed EMC values and used to calculate pollutant loads for a variety of metals. The equation enables calculation of a variety of pollutant loads in lbs/year, but these are not actually calculated in the TMDL. These loads represent highly variable estimates that would be difficult to reproduce for the purposes of measurable target limits and the TMDL endpoint is attainment of water quality standards.

12. As MEANG suggests, the use of site specific EMC values would be ideal and MDEP will consider developing Maine specific values for use in future TMDL's.

13. The suggested terms have been added to Table 2 on page 10.

14. We could have written a TMDL based on specific metals in-stream limits that would very difficult to attain and would not adequately address the cause of the observed problems. MDEP chose the %IC method as way to expedite the TMDL modeling phase and move quickly into the implementation phase. Our goal is to find an effective and efficient mechanism to fix the stream. The TMDL must demonstrate that the target will insure attainment of water quality standards; otherwise the TMDL will not meet the legal requirements of the Clean Water Act. The use of 8% as the target is based on information that correlates attainment of Class B aquatic life standards with impervious surface in Maine watersheds. While 8% may seem impossible to attain in a highly developed watershed, through the implementation of well designed BMP's the impact of the impervious surface can reduced to levels approaching 8%. The target can also be viewed as setting a hydrograph target in the impaired stream segment that would approximate an 8% developed watershed. This work has been done in other urban watersheds and by using an adaptive approach to implement BMPs overtime Birch can achieve Class B aquatic life standards. MEANG site contributions towards restoration

will be examined in the context of the entire watershed and success will be measured in the stream, not by site specific %IC.

15. This information is in a report cited in the TMDL and can be found on MDEP's website at http://www.maine.gov/dep/blwq/docmonitoring/stream/urban/index.htm . It is not included in the TMDL since it is lengthy.
16. MEANG's observation on habitat requirements of aquatic insects is correct. The TMDL summarizes information collected by MDEP's Biomonitoirng Unit and does not provide details on sampling protocols, which is available on request.
17. Restoring Birch Stream will be challenging and MDEP looks forward to working with MEANG to implement strategies that will insure future compliance with the Clean Water Act.

I hope my responses have added to your knowledge of the TMDL and how this TMDL contributes to the overall goal of attaining Maine's Water Quality Standards on Birch Stream..

Sincerely,

Melissa Evers
Environmental Specialist III
Maine DEP

Cc:
Don Witherill, DEP
MaryEllen Dennis, DEP
Jeff Dennis, DEP