



STATE OF DELAWARE
**DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL**

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DOVER, DELAWARE 19901

Office of the
Secretary

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Secretary's Order No. 2010-W-0032

**Re: APPLICATION OF VERNON KERSHAW FOR A SUBAQUEOUS LANDS
ACT PERMIT TO BUILD A DRIVEWAY STREAM CROSSING OF AN
UNNAMED TRIBUTARY OF THE SOUTH BRANCH OF NAAMANS
CREEK IN NEW CASTLE COUNTY**

Date of Issuance: October 5, 2010

Effective Date: October 5, 2010

Under the authority granted the Secretary of the Department of Natural Resources and Environmental Control (Department), the following findings, reasons and conclusions are entered as an Order of the Secretary.

Background

This Order considers a December 8, 2009 permit application submitted by Vernon Kershaw (Applicant) to obtain a permit under the *Subaqueous Lands Act* (SLA)¹ and the Department's *Regulations Governing the Use of Subaqueous Lands*.² The Applicant seeks to construct a driveway over an unnamed tributary of the South Branch of Naamans Creek in an unincorporated area of New Castle County. The driveway would result in the permanent loss of 286 square feet of private subaqueous lands and the construction would disturb 888 square feet of private subaqueous lands. In addition, the development of the land will cause secondary impacts associated with the construction in areas outside of the subaqueous lands. The driveway would provide access to a currently undeveloped

¹ 7 Del C. Chap. 72

² 7 DE Admin 7500.

property at the end of Kershaw Lane located off of Grubb Road in order to enable Applicant to build a single family residential dwelling.

The application was the subject of May 20, 2010 public hearing held before the Department's presiding hearing officer, Robert P. Haynes, at the Department's Blue Ball Barn in the Alapocas Run State Park near Wilmington, New Castle County. Mr. Haynes kept the public comment period open for 30 days and thereafter requested the Wetlands and Subaqueous Lands Section (WSLS) of the Division of Water Resources to prepare a Technical Response Memorandum, which Melanie Tymes, an Environmental Scientist in WSLS, submitted dated August 17, 2010 that recommended no permit be issued. On September 28, 2010, Mr. Haynes submitted his Hearing Officer's Report (Report), a copy of which is attached hereto, which also recommended denial of the requested application.

Findings and Reasons

First, I adopt the Report to the extent it is consistent with this Order. Second, I find that the record supports denial of the application because the proposed driveway construction would pose an undue risk of harm to the subaqueous lands. Moreover, this harm can be mitigated or even avoided entirely by the construction of a larger culvert capable of handling a larger water flow during 100 year flood conditions or even the construction of a small bridge that could eliminate any permanent loss of subaqueous lands. Third, I also agree with the many public comments by residents of the area and their elected officials that the area already experiences considerable problems with flooding and storm water runoff. I recognize that the area was developed before New Castle County's current extensive storm water regulation of new developments. Nevertheless, adding the stream crossing will impede the water flow during storms and add to the flooding already experienced although marginally. I agree that a larger solution

is needed to the existing problems in the entire watershed that has experienced frequent flooding, but those issues are not the subject of this permit application.

I agree with the Department's experts that the addition of a steam crossing, particularly as proposed by the Applicant, will increase the frequency of storm water runoff problems, and expand the 100 year flood plain to include flooding a public street. I also agree that the secondary impacts caused by the loss of trees should be considered and that the loss of trees in the watershed will increase the chances of flooding and the severity of floods. The record as developed by the Department from its experts and public comments provides ample support for a decision to deny the permit application.

Conclusions

In sum, I adopt and direct the following as the final order of the Department:

1. The Department has jurisdiction under its statutory authority to make a final determination in this proceeding under its state authority;
2. The Department provided adequate public notice of the application and the public hearing, and held the public hearing in a manner required by the law and its regulations;
3. The Department considered all timely and relevant public comments in making this determination and has developed a record to support its decision as identified in the attached Report;
4. That the Applicant failed to meet the burden to support the application as justified for a SLA permit because if the Department approved the application it would pose an undue risk of harm to the environment and public safety without any mitigation and when an alternative exists that would avoid most harm to subaqueous lands.

Consequently, the application should be denied for the reasons set forth herein, the Report and the recommendations of the Department's experts; and that

5. The Department shall publish this Order on its web site and provide such notice of it in a manner required by the law and the Department regulations.

s/Collin P. O'Mara
Collin P. O'Mara
Secretary

HEARING OFFICER'S REPORT

TO: The Honorable Collin P. O'Mara
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire
Senior Hearing Officer, Office of the Secretary
Department of Natural Resources and Environmental Control

RE: APPLICATION OF VERNON KERSHAW FOR A SUBAQUEOUS LANDS ACT
PERMIT FOR A DRIVEWAY STREAM CROSSING OF AN UNNAMED
TRIBUTARY OF THE SOUTH BRANCH OF NAAMANS CREEK IN NEW CASTLE
COUNTY

DATE: September 28, 2010

I. PROCEDURAL HISTORY AND BACKGROUND

This Report provides the Secretary of the Department of Natural Resources and Environmental Control (Department) with recommendations on Vernon Kershaw's (Applicant) September 4, 2008 Subaqueous Lands Act¹ (SLA) permit application. On January 13, 2010, the Department's Wetlands and Subaqueous Lands Section (WSLS) in the Division of Water published a public notice of the application in order to allow the public the opportunity to comment. In response, the Department received several timely requests for a public hearing, which the Department granted. The Department published public notice of a May 20, 2010 public hearing, which I presided over at the Blue Ball Barn, Alapocas Run State Park, near Wilmington, New Castle County.

Applicant seeks a SLA permit to build a concrete culvert stream crossing of an unnamed tributary to the South Branch of Naamans Creek in an unincorporated area of New Castle County north of Wilmington in the Kershaw Acres subdivision. The stream crossing would be used for driveway to an undeveloped property, which Applicant proposes to develop by building a single

¹ 7 Del. C. Chap. 72.

family residential dwelling. Private subaqueous lands owned by the Applicant would be impacted by permanent loss of 288 square feet of subaqueous lands for the driveway's construction over the stream using a 4'high x 10' wide x 16' long bottomless concrete box culvert for the stream's main channel, and a 27"high x 42"wide and 18' long elliptical concrete pipe for the stream's secondary channel. In addition, the 100 year flood plain would be changed by the crossing. Approximately 36.5 cubic yards of fill would be placed in the subaqueous lands and the construction would impact an estimated 888 total square feet of subaqueous lands. The Applicant holds a power of attorney from his 99 year old mother, who is the owner of the two undeveloped adjacent lots at the end of Kershaw Lane off of Grubb Road within an unincorporated area of New Castle County north of Wilmington.² Applicant originally also requested a sewer line utility crossing, which would have been buried beneath the stream, but at the hearing Applicant amended the application to remove the sewer line from the permit application because of New Castle County's revised location of a proposed sewer line replacement.

The May 20, 2010 public hearing developed a record from numerous public comments, which all opposed the application based upon concerns with flooding in the area. I requested the technical assistance from WSLs, and in an August 20, 2010 Technical Response Memorandum (TRM), attached hereto as Appendix A, WSLs recommends that the application be denied.

I determine that the record is sufficiently complete and that it supports a recommended denial of the SLA application.

² A 0.98 acre parcel (tax parcel 0604300157) and 0.24 acre (tax parcel 0604300232).

II. SUMMARY OF THE RECOMMENDED RECORD

I recommend that the Department's record contain the following: 1) the 92 page verbatim transcript of the May 20, 2010 public hearing; 2) the documents identified and introduced at the hearing, 3) all timely submitted documents the Department received from the public or Applicant received during the extended public comment period; and 6) this Report and the attached TRM prepared by WSLS.

Several elected officials attended the hearing and the public hearing record includes comments from New Castle Councilman Bob Weiner, State Senator Cathy Cloutier, and State Representative Bryon Short. Representative Short expressed his concern with flooding and its impact on neighbors and water runoff from building on the lot as proposed. Councilman Weiner comments indicated his familiarity with the site and his involvement with the County officials on whether the site should receive a building permit because it is prone to flooding. He introduced Mike Clar, Assistant County Engineer in the Land Use Department, who described the County's review process for stormwater management and building permits. Hap Ryan from the County was also introduced and Mr. Weiner's assistant, Lou Hinkle. Mr. Weiner also indicated that for the County's review that any culvert would have to pass a 1 in 25 year storm event and that a flood plain map would be needed to show the impact on the flood plain. Senator Cloutier welcomed people to the hearing and indicated that everything had been covered by the others.

At the public hearing, the Department's representatives, Laura Herr, Program Manager of WSLS, described WSLS' role in the SLA permit application process. Melanie Tymes, an Environmental Scientist in WSLS, also identified the following relevant documents from WSLS' files as exhibits: Applicant's SLA permit application (DNREC Ex. 1); the public notice of the application (DNREC Ex. 2); the public comments received from the notice (DNREC Ex. 3); the

public notice of the public hearing (DNREC Ex. 4); public comments from the public hearing notice (DNREC Ex 5); photos of the site (DNREC Ex. 6); the memo assigning the presiding hearing officer (DNREC Ex. 7); the memo to the court reporter (DNREC Ex. 8); and the SLA regulations (DNREC Ex. 9).

The Applicant's engineer, Carmine Casper, made a brief presentation. He indicated that the stream crossing meeting the design condition of a 25 year storm would disturb 20 linear feet of the stream. He indicated that Applicant elected to build a stream crossing that would be under water during a 25 year storm event. He indicated that the proposed stream crossing would alter the 100 year flood plain, but that the flood plain would not increase on anyone else's properties. Finally, he indicated the proposed Sunny Brae sewer connector eliminated the need for a stream crossing for a sewer line. Accordingly, that proposed subaqueous lands impact was removed from the application, which would be a temporary impact during construction as the sewer line would have been buried beneath the stream bed. Mr. Kershaw also spoke and indicated that he wanted to develop the property for his 99 year old mother to sell to his daughter to pay for his mother's nursing home cost.

Bob Orłowski spoke and indicated that he lives near the property and has seen the flooding occur and that the development would harm the timber on the property when there is an alternative route for the driveway and that the proposed culverts should be re-located to a better location.

Ken Rohrbach, who indicated he lives about a half mile upstream, asked questions on the construction of the culvert and the overflow pipe in the secondary channel of the stream. Mr. Casper answered and provided information that the 100 year flood plain is at elevation of 327

feet and the base of the creek is at elevation of 322 feet, or a 5 foot difference. Mr. Rohrbach asked about the runoff and the fast velocity of the stream during storms.

Lou Hinkle spoke as the senior legislative aide to Councilman Weiner and indicated that his office has been working on flooding issues in the area since 2009 and investigating this creek area. He also discussed the County sewer line replacement project. He also questioned the difference in the description of the culvert from what was in the application. Finally, he asked about the time line for a Department decision and the appeal process

Kate Bettally's comments questioned the 100 year flood plain and the impact on other properties from the proposed culvert. Mr. Casper answered that the Applicant had performed an analysis called a HEC-RAC solution to the flood line starting at the downstream side of the Sunny Brae road crossing location, where there are 5 culverts through which the stream passes. This study analyzed all the watershed upstream of the property, which consists of a 381 acre drainage area. He also indicated that the 100 year flood was a probability based upon rainfall records since 1918 and that the rainfall to achieve a 100 year flood was 8.8" and that soil conditions in a watershed are considered in the formula based upon a New Castle County soils map. Ms. Bettally also asked who would absorb the risk of a mistake in the calculations

Dave Scott, an adjacent property owner, spoke and his comments were on the impact of the project overall including the Sunny Brae sewer line replacement project and the ensuing tree loss. He wondered whether the study on the watershed reflected the loss of trees, particularly since last winter when many trees were lost. He provided photos of the area when flooded.

David Lau, a neighbor, spoke and presented comments that asked about property values if the lot is determined to be unbuildable. He asked questions on the Sunny Brae sewer replacement line and Mr. Kershaw indicated that he had nothing to do with its location.

Joe Wade spoke and his comments were on the map showing an increase impact on the public right of way roadway from the project, which Mr. Casper agreed would occur in a 100 year flood up to 3” to 4” of water on the roadway.

Jean Bernardo spoke and her comments were on the frequent flooding of her property on 2519 Deepwood Road. She has water come up to 6’ feet of her backdoor during most rains, and has 3 sump pumps and a French drain for her property. She wondered what recourse is possible if the stream crossing makes the flooding worse on her property.

Chris Flory spoke about his property on 2515 Deepwood Drive and indicated that water comes from the Foulk Woods development into the creek. He asked about the 100 year flood and Mr. Casper clarified that it was based upon 8” of rain in 24 hours. He mentioned the proposed sewer line replacement and its impact on the watershed, and that he was told that the sewer line had been re-located to accommodate the Kershaw property. He mentioned his review of the soil study for the sewer line replacement project and that the study showed high clay content, which silts and does not allow good drainage and that there is rock at a depth of 8’. He also provided photos of the area. He indicated the need to retain vegetation to prevent erosion and that the sewer line will cause the loss of about 3 acres of vegetation.

Leslie Bastinelli, who lives in Foulk Woods, spoke and asked that if the permit was issued whether the house would be built. Mr. Casper responded and indicated that the house would be built on .2 acre portion of the watershed and so any impact is in a watershed of 381 acres would be very small in comparison. Mr. Clar indicated that the County would still have to approve the building of the house, including a storm water permit.

Earl Smiddy, a resident of Foulk Woods, spoke and indicated that when he moved in 30 years ago he had no water in his basement and his backyard, but that now he often has water in

both places. He wanted someone to look at the big picture of managing the water from his development now before any more development occurs.

Michelle Fontana spoke as a president of a civic association and resident of 2535 Deepwood Drive about how her backyard floods all the time. She mentioned how she was told that the stormwater problem was caused by approval of new developments. She agreed with Mr. Smiddy that the bigger stormwater management problem should be addressed first before any more development is approved.

Marvin Specht of 2000 Dogwood Land spoke about the flooding problem, including the overflowing of Foulk road during storms, and how that road should not be flooded. He also indicated that his development has lost many trees in Foulk Woods and that this loss has contributed to the storm water flowing to the creek.

Heather Baker of 7 Alpine Court spoke and indicated that her property gets flooded now during simple rains, and that she does not want anything build that would make things worse.

Linda Carmichael spoke and asked about the flooding of the public right of way and whether that would be consistent with the law and regulations.

Mr. Clar responded to some of the comments and indicated the design and rationale for using a 100 year flood and the changing weather conditions in the long-term and that a 1 in 200 year flood may also occur. He indicated that the prior rainfall for a 100 year flood was 7.2” or 7.3,” but that it has been revised to 8.3.” This change would expand the flood plain from where it was all else being equal. He indicated that the County had no pending permit before it for decision and that the Applicant was seeking a SLA permit first before applying to the County. He indicated that the County would prefer no change in the 100 year flood plain as a result of the

development of the property and wanted the culverts to handle the entire water flow for such storms.

Tim Schaeffer spoke and indicated that the area is prone to flood including Foulk Road and that the whole issue is more significant than the one lot to be developed.

Mr. Weiner spoke and indicated that the flooding has worsened in 10 years as a result of development and the floodplain changes over time. He questioned the floodplain lines as shown on the Applicant's maps as whether they were truly accurate of current conditions given the development and changed weather and other factors. He also addressed the sewer line replacement and noted that it was being done to comply with federal water pollution laws and regulations at a cost of approximately \$300 million. He indicated the County had a letter that explained the proposed location.

Mr. Flory spoke again about the driveway construction and the authority over wetlands and Ms. Herr indicated that the County would control the drainage and that the United State Army Corps of Engineers had authority over the wetlands.

III. RECOMMENDED FINDINGS AND DISCUSSION

I find that the Applicant has failed to meet the burden of proof to justify the requested permit. I also find that no reasonable permit conditions could be imposed to warrant issuing a permit subject to conditions. This finding is based upon the record, which includes the recommendation from WSLs experts that the Department not grant the requested permit.

The WSLs TRM indicates that the road crossing is not recommended because it will permanently damage 286 square feet of subaqueous lands, and that no mitigation was proposed to offset this loss. Moreover, the crossing would temporarily adversely impact the subaqueous lands during construction over an 888 square foot area, and applicant had not proposed any

offset or mitigation for this harm. Finally, the crossing will result in secondary impacts from the development of the two lots, which will cause 50% of the trees on the lots to be cut down, result in soil compaction and increase by 55% the runoff into the stream from the lots compared to a 10% runoff from vegetative areas that now exist. The increased runoff will increase the stream velocity and stream bank erosion. The secondary impacts include paving or otherwise covering approximately 10% of the property with an impervious surface, and that approximately 40% of the property would be filled or have its soil compacted. The Department's experts also concluded that the size of the lots preclude much opportunity for on-site mitigation.

The TRM also indicates that Section 4.0 of the Regulations has not been satisfied by the application that will harm the environment and that no mitigation was proposed. Indeed, the Applicant did not even try to quantify the cost of avoiding any loss of subaqueous lands by building a bridge as an alternative to a stream crossing. The fact that Applicant indicated cost prohibitive in the application. I consider this non-responsive and should result in the rejection of the application. An applicant must make a good faith effort to provide the Department with the information it requests in its application or face the consequences of having an application denied. An applicant should not make a decision that something is cost prohibitive and that information is needed by the Department. The Department also is subject to SLA jurisdiction and owns stream crossing bridges of similar size. Thus, the Department is aware that the construction of a bridge cost more than a culvert, but the Department does not consider the higher cost as cost prohibited.

The TRM also disputes the Applicant's contention that only the Applicant's land will be impacted by the revised flood plain experienced during a 100 year flood. The TRM indicates that the public right of way Kershaw Lane would be impacted by the revised flood plain and this

alone poses undue public safety risk. The TRM also indicated that the harm from flooding could be reduced by bridging the stream or building a larger bottomless arched culvert. It is not for the Department to assist in the design of a crossing to submit to the Department, but only to decide on the design the Applicant has selected to submit. Clearly the 1 in 2 year design submitted and its adverse impact on flooding is contrary to the Regulations' purpose to protect the environment and the public safety.

The proposed design also assumes that the design will operate properly, but often storm events cause even properly designed culvert to fail to operate because of debris clogging the culvert. The Department does not consider that the proposed culvert should be approved when there are alternatives to avoid or mitigate the adverse consequences of the proposed culvert.

Based upon the public hearing record and the TRM from WSLs, I find that the proposed culvert would pose an unacceptable risk of additional flooding in an area already prone to flooding and harm subaqueous lands without any proposed mitigation. While the Department may propose suitable mitigation, it has no obligation to propose mitigation. The Applicant does have a burden to submit an application that meets the regulatory burden imposed. Finally, I question the public safety appropriateness of building any residence that uses a driveway that would be prone to frequent flooding.

IV. RECOMMENDED CONCLUSIONS

Based on the record developed, I recommend that the Department approve the following conclusions:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding based on the record, which after balancing all the information in the record developed by the Department supports not granting Applicant a SLA permit;

2. The Department provided adequate public notice of the applications and the public hearing as required by the law and the Department regulations;

3. The Department held a public hearing in a manner required by the law and its regulations and has considered all timely and relevant public comments in making its determination;

4. The Department denies the requested SLA permit based upon the record that Applicant failed to provide adequate support for the road crossing, alternatives and any mitigation, and the Department concludes that an acceptable alternative exists in a bridge or larger sized culvert along with a proposed mitigation plan to offset the harm; and that

5. The Department shall publish this Order on its public web site and provide such other service and notice as required by law and Department regulation or otherwise determines necessary and appropriate.

s/Robert P. Haynes

Robert P. Haynes, Esquire
Senior Hearing Officer



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
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WETLANDS & SUBAQUEOUS
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Technical Response Memorandum

To: Robert Haynes, Hearing Officer

Through: Kathy Bunting-Howarth, Director, Division of Water
Laura Herr Section Manager, Wetlands and Subaqueous Lands Section

From: Melanic Tymes, Environmental Scientist, WSLS

Date: August 17, 2010

Subject: Vernon Kershaw Subaqueous Lands Permit Application

DL 8/19/10
JH 8/17/2010
MBT 8/17/2010

INTRODUCTION

The Wetlands and Subaqueous Lands Section (WSLS), Division of Water, Department of Natural Resources and Environmental Control received an application from Vernon Kershaw to construct a road crossing and utility line in an unnamed tributary to the South Branch of Naamans Creek at the end of Kershaw Lane, Wilmington, New Castle County, Delaware. The proposed project is subject to the requirements of the Subaqueous Lands Act (7 Del C., Chapter 72), Regulations Governing the Use of Subaqueous Lands.

This Technical Response Memorandum (TRM) presents the Wetlands and Subaqueous Lands Section's (WSLS) findings regarding the above-referenced permit application. The TRM also addresses comments presented at the public hearing held on May 20, 2009. The project was placed on 20 day public notice on January 13, 2010. During the public notice period the WSLS received 15 letters of objection to the project; all of which requested a public hearing. The comments included concerns about flooding; specifically, would the installation of a road crossing cause more flooding for the upstream residents. Comments opposing the project were received in advance of, and during, the hearing. The only favorable comments came from the applicant and his family.

The applicant, Vernon Kershaw, proposes to install a new road crossing and a utility line for a single residential lot. One 18 foot long 4 foot high by 10 foot wide culvert is proposed in the main channel of the stream and would be submerged below the natural stream bottom. A second 16 foot long 27 inch by 42 inch elliptical pipe will be installed in a secondary channel that carries overflow from the main channel, water from the springs on site and drainage from the neighboring properties. The culverts are designed to pass a 2 year storm (1 in 2 chance of occurring each year). Larger storm events will run over the driveway. Approximately 36.5 cubic yards of fill will be used for the project which will impact a total of 286 square feet of subaqueous land and temporarily impact 888 square feet of subaqueous lands during construction. The original proposal also included the installation of one 6 inch sanitary sewer main by open trench cutting and backfilling. However, this proposal was withdrawn by the applicant during the hearing.

The site is comprised of two undeveloped wooded lots measuring 0.98 acres and 0.24 acres (1.22 acres total). The lots are situated at the end of a cul-de-sac with a 10 foot wide stream following the west and north side of the property separating the main portion of the lot from the street. The lots are subject to flooding, with 0.65 acres of property within the 100 year floodplain, about 0.28 acres of which are waters and non-tidal wetlands. These wetlands transect the property splitting the uplands into three areas. There is a New Castle County sanitary sewer trunk line proposed along the south and east sides of the property. The trunk line is not part of this application. According to the applicant, the size of the watershed above the project site is at least 318 acres and the bankfull discharge is 179 cfs (about 80,550 gal/min). A house may be proposed on the 0.2 acre section of land remaining outside of the sewer easement, 100 year floodplain and wetlands. There is a road crossing approximately 495 feet downstream of the proposed crossing (Crenshaw Road) that consists of five 48 inch diameter reinforced concrete culvert pipes. This crossing provides for a 63 square foot cross-sectional area versus 43 square feet for the proposed pipe, and even with this larger cross section, has on several occasions been overtopped by flood waters.

REGULATORY REVIEW

The following review evaluates the proposed project with respect to the requirements of the Subaqueous Lands Act (7 Del. C., Chapter 72 (Chapter 72) and the Regulations Governing the Use of Subaqueous Lands (Regulations) adopted in accordance with the statute. The Regulations provide the criteria for evaluating projects that are proposed to be constructed in public or private subaqueous lands. The burden is on the applicant to satisfy the Department that the requirements of these Regulations have been met; and if the granting of the permits, lease or approval will result in loss to the public of a substantial resource, that the loss has been offset or mitigated. The public comments received prior to, and at the hearing, as well as the Department's regulatory evaluation, are addressed according to the pertinent sections of the Regulations as follows.

Section 4.0 Criteria of Permits, Leases and Letters of Authorization

Section 4.0 of the Regulations requires that the application be evaluated based on the consideration of specific performance specifications, standards and other criteria, including Section 4.6 - Public Use Impacts, Section 4.7 - Environmental Considerations and Section 4.8 - Requirements for All structures. It also states that an application may be denied if the activity could cause harm to the environment, either singly or in combination with other activities or existing conditions, which cannot be mitigated sufficiently.

Section 4.6 Public Use Impacts

Under this section the Department must consider, among other things, the potential effect on the public and the extent to which the public would benefit or suffer detriment from the project. Additionally, the Department must consider the degree to which the applicant's primary purpose could be realized by alternatives that would minimize or avoid impacts.

Flooding is common in the area of the proposed crossing. Flooding is a natural process that occurs in all streams, whether the watershed is in a forested or an urban landscape. However, flooding occurs more frequently and more rapidly in heavily developed watersheds such as this one. The neighbouring communities of Foulkwoods and Fairwoods, as well as other residents on Kershaw Lane already experience problems with flooding. Based on an engineering analysis provided by the applicant, the proposed project will increase the area within the 100 year floodplain by approximately 0.1 of an acre, including a portion of the public cul de sac at the street end. The project would also increase the width of the 100 year floodplain at the proposed road crossing location from 85 feet to 160 feet, and will raise the floodplain into Kershaw lane, flooding the access to three properties, including the applicant's. This would suggest that flooding in other low lying property in close proximity to the culvert could be increased as a direct result of the applicant's proposed project in subaqueous lands.

In addition to flooding, improperly designed crossings restrict natural stream flow, causing several problems including scouring and erosion, high flow velocity, clogging and ponding. The residents downstream would be the most likely to be negatively affected by this. Those properties already show signs of bank erosion which may be exacerbated by the applicant's proposed crossing.

While the crossing would benefit the applicant by providing access to the property, this need must be weighed against the public impact. The culvert, as designed, may cause harm to the current or future owner of that property and neighbouring properties located upstream and downstream. This impact can be avoided by bridging the stream or installing a larger bottomless arched culvert which spans the waterway causing little change to the stream velocity and allowing flood waters to pass under the bridge. If alternatives such as these were utilized, the applicant would be able to benefit from access to his property, without detriment to the public.

Section 4.7 Environmental Impacts

The Regulations require the Department to consider the potential environmental impacts of any proposed activity. This includes the project's impact on aquatic organisms, habitat, water quality, surface water hydrology, sediment transport, and cumulative and secondary impacts.

The Department considers the potential cumulative impacts of this project in light of the proposed County sewer line improvement which will result in the loss of additional forest cover, increased soil compaction and a greater area of impervious surface in the vicinity of the applicant's project. These activities reduce precipitation from infiltrating into the soil, increasing runoff to as much as 55% of the total precipitation as compared to 10% in vegetated areas. Constructing a driveway and house on the property will increase the total runoff in the area and the speed with which it reaches the stream leading to a greater frequency of flooding, as well as increased stream velocity and erosive power. While the sewer line project is a separate and distinct project, the Department is concerned that it will exacerbate the adverse impacts of the applicant's road crossing design by further increasing runoff to the stream above what is currently calculated.

The proposed design utilizes many of the Department's recommended practices by minimizing the length of the proposed culvert pipes, depressing the pipes and using pipes for base flow and storm flow. However the disturbance from tree loss, construction, soil compaction, and increase in impervious surface on this site will result in permanent impacts and a net loss of habitat. Leaf litter from the trees provides a primary food resource in stream ecosystems, and the trees reduce stormwater runoff, stabilize stream banks, and provide shading which improves dissolved oxygen levels in the stream. Trees will be removed on roughly 50% of the site. Approximately 10% of the site will be paved or otherwise permanently covered with impervious surface and an additional 40% of the area will be filled and/or have the soil compacted. The applicant did not offer a proposal to offset or mitigate the impacts or potential harm caused by the activity, nor is there much opportunity for possible on-site mitigation through enhancement as the entire site is currently forested.

CONCLUSION

The WSLS finds that the Vernon Kershaw Subaqueous Lands Permit Application for work in the unnamed tributary to the South Branch of Naamans Creek does not comply with the Regulations. The proposed structures would provide access to the residential property; however the structures will also create an unacceptable level of negative impacts to the public in terms of increased flooding. The project will also result in a permanent impairment to the stream and the applicant has not proposed appropriate mitigation to offset those impacts. Furthermore, the applicant's primary purpose and objectives can be realized by bridging the stream or installing a larger bottomless arched culvert which spans the entire channel and allows flood waters to pass.

For the above stated reasons, the WSLS recommends that a permit for installing the road crossing, as currently designed, be denied.