

Response to OMNR Review Comments

Bumstead Pit

October 10, 2014



Response to OMNR Review Comments

Bumstead Pit

Prepared for:

Brian and Pearl Bumstead

Prepared by:

AET Group Inc.

531 Wellington St. North

Kitchener ON N2H 5L6

T (519) 576-9723

F (519) 570-9589

www.aet98.com

October 10, 2014

Project No. BUM-EC1011-151



MEMORANDUM TO: Kim Benner, District Planner
Ontario Ministry of Natural Resources, Midhurst District

MEMORANDUM FROM: Chris Hart, AET Group Inc.

DATE: October 10, 2014

RE: Response to NETR Review Comments for the “Bumstead Pit”
Brian and Pearl Bumstead
License Application for a Category 1, Class ‘A’ License under the
Aggregate Resources Act – Part Lot 27, Concession 7, Township
of Chatsworth, County of Grey

This memorandum is in response to review comments of Amanda McLachlan contained in correspondence to Genevieve Scott, Cuesta Planning Consultants on February 18, 2014. Please note that only the Ontario Ministry of Natural Resources (OMNR) comments regarding the Natural Environment Technical Report (NETR) are addressed.

The following memorandum with attachments provides answers to address specific concerns.

This document is structured so that the original text of the OMNR letter to Genevieve Scott is presented in italics and the relevant answers and supporting information follows. The attached Figure 1 for the study area shows land use, ELC polygons, breeding bird point count stations and amphibian survey stations. The other attachments include a list of breeding birds for June/July 2014 and the OMNR Bobolink Survey Methodology.

Natural Environment Report

Significant Habitat of Endangered and Threatened Species

Grassland Breeding Birds

The NETR indicates that “As part of standard field studies bird surveys were undertaken on June 7 and July 25, 2011. Survey methods for breeding birds were completed following the guidelines of The Atlas of the Breeding Birds of Ontario (Cadman et al, 2007)”. The Ministry of Natural Resources has specific survey methodologies for threatened grassland breeding bird surveys (Bobolink and Eastern Meadowlark).

The Ministry requires the environmental consultant provide further details of the breeding bird survey methodology completed. At this time the report only identifies the dates that the surveys were undertaken. Further information is required including but not limited to the specific times of the survey on each date, the level of breeding bird survey effort (i.e. time dedicated to breeding bird surveys, not other wildlife or flora/fauna surveys), weather conditions, the exact point count locations and the time/survey effort for each point count location.

The Ministry requires this information to determine whether significant habitat of endangered and threatened bird species occurs on the adjacent land, for the potential species outlined in the NETR (Bobolink and Eastern Meadowlark) as well as other grassland breeding birds that utilize agricultural and pastoral lands. The Ministry requires this information before providing any further opinions or further issues on significant habitat for endangered and threatened species potential on adjacent lands for grassland breeding birds.

Bumstead Pit Bird Surveys - 2014

As noted in the Level 1 & 2 Natural Environment Technical Report for this project (04_24_2013), bird surveys were undertaken on June 7 and July 25, 2011. Survey methods for breeding birds were completed following the guidelines of The Atlas of the Breeding Birds of Ontario (Cadman et al, 2007, 2003, 2001). The results of these surveys were faithfully and accurately reported in the NETR. At no time in 2011, 2012, or 2013 were Bobolinks or Eastern Meadowlark birds observed or detected within the study area or the general region of the site.

It is important to note that although potential habitat for Eastern Meadowlark is found in lands adjacent to the proposed license area none of these birds or Bobolink were detected. During the spring and summer of 2014 new bird surveys were undertaken within the survey area and included lands beyond in a search for both Eastern Meadowlark and Bobolink.

A full breeding bird study was undertaken at the level of precision requested by OMNR. A survey for Eastern Meadowlark using the recommended OMNR SAR protocol was undertaken as well; this is attached at the end of this report. The protocol provided was for Bobolink with the proviso by Amanda McLachlan that this is also appropriate for Eastern Meadowlark. (OMNR. 2013).

Breeding birds were surveyed twice, on June 2nd and June 19th with a standard procedure based on the Ontario Breeding Bird Atlas "Guide for Participants (March 2001) and Addendum (February 2003); SAR surveys were also undertaken on July 3.

TABLE 1 - 2014 Breeding Bird Survey Schedule

Date (2013)	Surveyors	Time (Duration)	Weather Conditions
June 2	M. Dil, C. Hart	5:45 – 9:24 AM (3.5 hrs)	Temperature: 17-25°C, wind: < 5 km/h, cloud cover: 10%, precipitation: none
June 19	M. Dil	5:50 – 10:20 AM (4.5 hrs)	Temperature: 15-18°C, wind: 8 km/h, cloud cover: 10%, precipitation: none
July 3	M. Dil	5:15 – 8:42 (3.5 hrs)	Temperature: 12-13 °C, wind: 0-2 km/h, cloud cover: 75%, precipitation: none

Bird surveys were started at dawn and continued until completed. Point counts were taken for 5 minutes for general breeding birds at individual survey stations with the exception of those undertaken in polygons with potential for Eastern Meadowlark or Bobolink; these SAR counts were longer at 10 minutes as required by the OMNR protocol. The SAR bird surveys were run concurrently with the general Breeding Bird surveys. SAR surveys were undertaken in polygons 3, 4 and 8 during the general breeding bird surveys and also on July 3.

Transects through the approximate centre of each polygon were followed and point counts were undertaken at standard sample points located at a minimum of 250 meter intervals along the transects. The point count stations and survey transects are shown in the attached Figure 1. Since the site polygons are less than 500 meters in width a single transect was sufficient to provide full coverage. As required, SAR surveys were started 30 minutes after dawn and continued until no later than 9:00 am; other general bird counts were continued after 9:00 am. Wherever possible verification of bird species by sight was undertaken. It is important to note that the same point count stations (based on GPS coordinates) were used for each bird survey event. GPS UTM coordinates for all point count stations are provided in Figure 1.

As an extra precaution against missing a count for Eastern Meadowlark or Bobolink birds that might be traversing the study area from locations beyond the study area perimeter, a supplemental call playback methodology was used. Breeding and territorial calls obtained from the Cornell University, Lab of Ornithology, were played with an amplified speaker that was synched by 'Bluetooth' with a smart phone linked to the Cornell web site. (Cornell Lab of Ornithology, 2014). Each point count for SAR consisted of 5 minutes of passive listening followed by 2 minutes of periodic call playback at a natural volume and then another 3 minutes of passive listening.

In all cases it is noted that through the entire study process, including surveys and subsequent field work in 2011, 2012 and 2013 no Eastern Meadowlark or Bobolink birds were detected.

The results of the 2014 Breeding Bird surveys are shown in Table 2 - 2014 Breeding Birds - June and July 2014 in the attachments at the end of this report. The Breeding Bird Survey Forms which show point counts with other information including specific survey times, level of breeding bird survey effort (time dedicated at each point count location) weather conditions, GPS location for each point count station (UTM coordinates) and the time survey/ effort for each point count location as well as the breeding evidence codes for each bird species detected are available upon request but at 104 pages are too voluminous to include in this report.

Bobolink

Typical Bobolink habitat consists of open grasslands and hay fields. Specifically, habitat requirements include moderate to tall vegetation, moderate to dense vegetation, moderately deep litter, and absence of woody vegetation (Dechant et al., 2003). Damper lowland areas appear to be preferred over dry upland areas. Scattered forbs (e.g. clover) are beneficial for nest-site cover. Potential Bobolink habitat at the Bumstead Pit site includes cropland, pasture, cultural meadow and meadow marsh.

No Bobolink birds were observed at any time during surveys in 2014 nor have they been observed at any time in the past 3 years of field work within the study area.

Eastern Meadowlark

Eastern Meadowlark habitat typically consists of native grasslands, pasture, and hay fields. Ideal characteristics include moderately tall grasslands, abundant litter cover, moderate to high forb density and lack of woody vegetation (Hull, 2003). The potential habitat for meadowlarks at the Bumstead Pit site is limited to the cultural meadow area along the slope west of the existing gravel pit and within hedge row areas.

No Eastern Meadowlark birds were observed at any time during surveys in 2014 nor have they been observed at any time in the past.

Butternut

The NETR indicates that contain hedgerows and wooded areas occurs on the subject lands and the 120 metres adjacent lands. These areas may have the potential to contain Butternut an endangered tree species. Butternut is common across Midhurst District.

Although it is not listed as an observed species in the NETR, the Ministry recommends confirmation of the survey effort for this species is provided. This will allow the Ministry to confirm presence/absence of this

species on the subject lands and within the 120 metres adjacent lands. Significant habitat for this species is considered the Butternut tree plus 25 metres.

In the original vegetation surveys conducted in 2011, Butternut (*Juglans cinera*) was not found within the study area including lands adjacent to the proposed license area. In 2014 the study area was surveyed again following recommendations of OMNR (OMNR, 2014). All polygons including cropland and hedgerows were surveyed on May 8th and again on July 3rd. Every foot of every hedgerow, all field verges and open areas of existing woodlands and cultural plantations were walked. No signs of either Black Walnut or Butternut were found including leaves, nuts, mature trees, saplings or seedlings were found. These trees were not detected within the region of the study area over the period from spring of 2011 to July 3, 2014.

Significant Woodlands

The NETR does not appear to adequately consider the ecological function of the adjacent woodlands. In order to demonstrate no negative impacts to the significant woodland feature and its ecological function, the function of the woodland needs to be adequately considered.

The County of Grey has identified potential significant woodlands in their Official Plan and has also defined criteria to confirm significance. The ARA standards recognize that the municipality is responsible for the criteria of certain features including significant woodlands. The ARA application still needs to prove no negative impacts to the significant woodland and its ecological function as per the ARA Provincial Standards.

The Ministry does not feel that the NETR (Section 9.2) has adequately demonstrated no negative impacts to the woodland feature and its ecological function. The presence of residential strip development does not necessary remove the full ecologic function of a woodland feature and there does not appear to be evidence to support this conclusion in the NETR or reference to other studies or supporting documentation to support this conclusion.

As per Table 7-2 of the Natural Heritage Reference Manual the ecological functions of woodlands can include: the woodland interior, proximity to other woodlands or other habitats, linkages, water protection, woodland diversity. Further section 7.4 also outlines consideration for adjacent lands which could include (but not limited to) sensitivities of the plant and animal species. Further information and rationale needs to be provided to prove no negative impacts to the adjacent Significant Woodlands feature and its ecological function.

In the Final NETR (04_24_2013), Section 4.2.3 “Significant Woodlands” it was noted that ... The OMNR Comments from June 25, 2012 stated that, “...where the planning authority has identified criteria to assess significance, the criteria of the planning authority is intended to be used for the purposes of the ARA application”. Accordingly a review of the relevant Official Plan policies with regard to woodlands was undertaken. The Significant Woodland policies of the County of Grey Official Plan (June 25, 2013) are very clear.

Some of the woodland areas within 120 meters of the proposed license boundary meet the County criteria for significance based on size. These are areas of woodland found to the south of the 60 Side Road (polygons 9 and 10) and west of Veteran’s Road S. (Polygon 1). These areas are shown on the County of Grey Official Plan, Appendix ‘B’ – Constraint Mapping, Map3.

Following studies of 2014 it is still apparent that these are the only woodland features at this site with any significance in terms of ‘Ecological Functions’. As described in Table 7.2 (Recommended significant Woodland Evaluation Criteria and Standards) it is clear that the only relevant criterion is based on size. (County of Grey, Official Plan, June 25, 2013).

Woodland Interior

Polygon 1 – does not contain woodland interior habitat due to small size

Polygon 9 and 10 – Do not contain woodland interior habitat but do contribute to a larger woodland feature and thus provide buffering functions; not significant in their own right.

Polygons 4, 5, 6, 7, 8 – Do not contain woodland interior or contribute to woodland interior habitat. Do not buffer a larger woodland feature with woodland interior

Proximity to Other Woodlands or Other Habitat

As noted in the forgoing, Polygons 1, 9 and 10 are considered significant due to their component value as part of larger and extensive regional woodland habitat.

Polygon 8 which is a fragmented, low quality Jack Pine plantation (CUP 3-4) might be considered significant in this sense and by extension the other treed polygons 4, 5, 6 and 7. However, these latter natural heritage features are considered low quality due to their disturbed nature and areas of spotty and low density. It is important to note that the County does not consider these to be contributing significantly to the regional woodland character.

It is expected that this situation exists because neither of these latter woodland features are providing ecological benefits to polygons 1, 9 or 10.

Linkages

The woodlands in polygons 1, 9 and 10 by being defined by the County as significant based on contribution to larger regional features may be considered to contribute to a, "...defined natural heritage system.", as represented by the regional woodland. There is also limited linkage potential for these polygons as they are part of larger landscape features that provide ecological linkage functions.

However, for polygons 4, 5, 6, 7, 8 the linkage potential is limited due to the fragmented and disturbed nature of these features. While polygon 8 is within 120 meters of polygon 9 the link across the 60 Side Road corridor is exposed, narrow and tenuous at best. At the other end of this fragmented landscape at the eastern edge of the proposed license area there is no link to other significant features and thus these latter polygons are not considered significant.

Water Protection

The hydrogeology report by Gamsby and Mannerow for this project (September 2013) did not identify areas of sensitive groundwater discharge or sensitive recharge within the study area. However it is clear that the lands south of the 60 Side Road including polygons 9 and 10 are elevated above the area of the proposed license. These lands may be considered to be a recharge zone and it is noted that there is a spring approximately 30 meters north of the 60 side Road within the area of the proposed license. This spring has been used in the past for watering cattle however it does not give rise to a stream nor is it associated with a recognized wetland.

It may only be speculated what role the drumlin feature south of the 60 Side Road plays with regard to ground water recharge in this area of Grey County. The Gamsby and Mannerow hydrogeology report (September 2013) notes that, "Based on the water level elevations

measured, the localized ground water flow direction in the overburden at the site is to the east-northeast. Based on the topographic features and the relative locations of the surface water features down-gradient of the site the regional ground water flow direction is inferred to be to the east and south, towards the ponds and marshlands.” (p. 6). The hydrology site review determined that ...”Therefore, regionally the surface water direction and overburden groundwater flow direction from the site is to the east towards the wetland and stream system which belongs to the Saugeen River watershed, which is shown to flow southerly, then ultimately drains to the west towards Lake Huron.” (P. 6).

There is an apparent difference between more surficial flow and ground water flow direction. This same report notes that ...,”Based on the water level elevations measured, the localized ground water flow direction in the overburden at the site is to the east-northeast. However, based on the topographic features and the relative locations of the surface water features down gradient of the site, the more regional ground water direction is inferred to the east and south, towards the ponds and wetlands.” (P. 7).

This situation indicates that the height of land associated with the drumlin south of the site has a local surficial and shallow aquifer influence but does not appear to significantly affect regional groundwater flow characteristics at the site. Thus it is unlikely that the associated woodland (polygons 9 and 10) has a significant role in water protection and it is not considered significant in this case.

The same is true of the woodland area of polygon 1 which is such a small feature that it is highly unlikely to be affecting the local surficial flow since it does not retard and pond water nor does water flow through this and continue as a stream down slope.

These woodland features in polygons 1, 9 and 10 are at elevations above the regional and local water tables and flow is away from them. For these reasons it is anticipated that since the proposed aggregate extraction is above the water table there will not be negative effects on any of the woodlots at the site or on adjacent lands.

Woodland Diversity

Woodlands within the study area are either of poor ecological quality because they are early successional plantations or they are fragmented and have been compromised through development or poor logging practises. It is this author’s opinion that none of the woodlands within the study area could be considered significant based on species composition, biological diversity or diversity in habitat.

Polygon 6, which lies within the proposed license area was high-graded and logged about 15 years in the past. It is clear that too many trees and those below recommended size classes were cut. As a result this woodlot which extends into polygon 7 is of lower quality. There are openings where the woodland ground flora has disappeared and been replaced by old field habitat with agricultural grasses, asters, goldenrods and other common plants. Former logging haul roads and farm lanes have contributed to fragmentation of these woodlands and created openings which are being colonized by aggressive and adventitious species. Some of these plants such as goldenrods may delay the successional development of the woodland as they prevent arboreal seedling germination and development.

The Jack Pine plantation character of polygons 3, 4 and 8 is of low biodiversity. These polygons have fragmented habitat with a high component of cultural meadow and they have not been

colonized by many trees or shrubs. It is anticipated that it will be many years before these woodland areas exhibit sufficient biodiversity to be considered significant.

Potential for Negative Impacts

In accordance with the findings of the Level 1 Hydrogeological Study of Gamsby and Mannerow (September 2013) it is not expected that the woodlands within the study area will be negatively affected by aggregate extraction within the proposed license for the following reasons:

- the regional groundwater flow direction is inferred to be to the east and south towards the ponds and marshlands;
- the localized groundwater flow direction in the overburden at the site is to the east-northeast;
- extraction is proposed to be above the water table and will be adjusted if anomalies are encountered to maintain the minimal required separation distance;
- there is an adequate set back from all woodlands to mitigate any potential for local minor changes in shallow water conditions as may be expected from year to year.

The groundwater flow and elevation will remain unchanged and this situation will protect areas of significant woodland. Extraction limits are far enough from all woodlands within the study area to avoid any direct impacts.

There will be no extraction within woodlands. Primary access will be off of the 60 Side Road at the eastern property boundary. This is as far from the designated significant woodlands as it is possible to get within the proposed license area and any significant conflict with natural heritage features will be avoided at this location since polygon 9 is a mid-successional woodland with limited biological diversity. The other land use at this location is cropland and the Jack Pine plantation in polygon 8 which is an area of low biological diversity.

Since the 60 Side Road is paved it is not expected that there would be any significant negative effects from dust. It is important to note that the area of the proposed license does not have features that constitute landscape linkage for wildlife. Any disturbance of deer access will be temporary and deer will still be able to traverse the site periodically until closure and resumption of agricultural practises.

It is expected for these reasons that the woodland within the study area and beyond the 120 meter set back will remain intact and unaffected by the proposed aggregate operation. There will be no intrusion into any woodlands and the current ground water supply will be unaffected.

No buffer areas of trees or shrubs will be removed from polygon 6 so this feature will remain unchanged. As well, it is expected that since vehicular traffic including farm machinery and truck traffic has been persistent in this area of Grey County in the past there will be no significant change in the status quo of biological activity involving wildlife that are intrinsic with respect to maintaining the local woodland habitat.

Potential Significant Wildlife Habitat

The NETR indicates that no amphibian surveys were completed as the study area did not contain habitat suitable for amphibian breeding. According to the NETR the SWD (Deciduous Swamp) ELC classification is present within 120 metres of the site. This ELC community type has the potential to be considered

Amphibian Breeding Habitat (Woodland) in accordance with the MNRs Draft Eco-Region Criterion Schedule 6E.

From the description of this area contained in the NETR on page 6-7, the SWD (Deciduous Swamp) ELC is periodically wet in the spring. According to Draft Eco-Region Criterion Schedules wetland breeding pools within a woodland may be permanent, ephemeral, seasonal, large or small and could be located within or adjacent to a woodland.

It would appear that the adjacent lands contain potential significant wildlife habitat: Amphibian Breeding Habitat (Woodland), yet no study was completed in the appropriate time of year to determine suitable breeding areas. Further there was no consideration of any negative impacts on this potential significant wildlife habitat feature and its functions located on adjacent land within 120 metres.

Significant Wildlife Habitat often overlaps with other significant features such as Significant Woodlands. However, in this case the potential amphibian breeding habitat function of the adjacent significant woodlands was not considered in the NETR section for Impacts to Significant Woodlands either.

In response to the comments regarding Potential Significant Wildlife Habitat amphibian calling surveys were undertaken to determine seasonal locations of frog populations and to assess the relative relationships between habitat features.

Amphibian calling surveys were undertaken for polygons 5, 6, 7, 8 and 11 on May 6, June 1 and also June 18 in 2014. These surveys followed the standard protocol of the Marsh Monitoring Program (Bird Studies Canada, 2008). The survey sheets are available for review but are not included in this report for the sake of brevity. It is noted that the focus of amphibian studies was on polygon 5 as requested by OMNR.

As well, notes were kept on incidental observations from earlier in the spring and during other site visits in the summer of 2014. An attempt was made to determine if frogs were moving between over-wintering areas in the woodlot of polygons 6 and 7 and the ponds in polygon 5.

It should be noted that there are no sizeable and persistent wet areas or areas of impounded water in polygons 4, 6, 7 and 8. The woodlands in polygon 6 and 7 are open as previously described from past high-graded logging practises. All sites are generally dry since this is a well-drained site due to the cobble tills present.

Since the woodlands are dry, open and with little ground litter it was expected that there would be little available habitat for amphibian over-wintering. It should be noted that a large proportion (approx. 35%) of polygon 5 consists of upland areas with side slopes to lower wetter areas. The upland habitat consists of Jack Pine plantation and cultural meadow. The habitat in the bottom of this morainal feature (kettle depression) is seasonally wet with a range of swamp (SWT 3-2, SWT 3-5) and marsh (MAM 2-2, MAM 3-1, MAM 3-2) habitat.

The wetland areas contain organic soils and accumulated organic debris. In drier years (2011, 2012, 2013) the kettle bottom is moist with no standing water by mid-July. At other times the kettle may contain as much as 1.5 meters of standing water in the spring with the depth declining to less than a meter as the season progresses.

It appears that this main feature has all of the requisite characteristics necessary to maintain a breeding population of frogs; the results of frog calling surveys and spring frog searches support this conclusion.

The spring of 2014 was unusually cold and there was a high snow pack, in the region of the study area, which persisted in shaded and wooded areas. It is speculated that this led to a late start to the amphibian breeding season. Early visits in April were periodically made to the polygon 5 site to check for migrating frogs while conducting work on other projects in Grey and Wellington County. Over the course of field observations from mid-April to June 19th, 2014 frogs were not seen migrating between woodlands and seasonally ponded areas. As well no frogs were detected within the woodlots in polygons 6 and 7.

On May 6, 2014 Chorus Frogs and Spring Peepers were heard calling prior to 6:00 PM on a sunny day in the pond in Polygon 5 and while Leopard Frogs were seen in shallow warmer waters at the pond edge, these were not calling. All frog calls in all polygons surveyed ceased before sunset and this was thought to be due to the low air temperatures (6 - 8 degrees Celsius) after 4 PM and water temperature between 4 and 6 degrees Celsius.

On June 1, 2014 Spring Peepers and Gray Tree Frogs were heard in the pond in polygon 5. Northern Leopard Frogs were observed in this pond but were not calling. By June 18th only Gray Tree Frogs were heard although Leopard Frogs could be observed in low vegetated swales in polygon 4 adjacent to polygon 5. By the end of July 2014 Leopard Frogs were only observed close to polygon 5.

The large pond to the east of polygon 8 had a similar complement of species. On June 1, 2014 Spring Peepers, Gray Tree Frogs and Green Frogs were heard calling; by June 18 only Gray Tree Frogs and Green Frogs were in evidence.

A calling survey for the low, wet area in polygon 11 was undertaken from the intersection of Veteran's Road S. and the 60 Side Road on the same dates. On June 1, 2014 no calls were heard and on June 18th Gray Tree Frogs were heard. Over the course of all field work the locations noted in the foregoing were the only locations of frog calling within the study area.

Since the hydrogeological study (Gamsby and Mannerow, June 2013) noted that the water table within the area of the proposed ARA license will not be intersected, and this is set by the regional flow characteristics, it is anticipated that water elevations and seasonal characteristics in ponded areas and associated habitat will not be negatively affected by the proposed aggregate pit activities.

As well, based on general field observations for the period 2011 to 2014 (inclusive) and the amphibian calling surveys of 2014 it appears that woodland and plantation habitat of polygons 4, 6, 7 and 8 are not contributing significantly to amphibian populations within the study area including adjacent lands. The wetland area within polygon 5 and east of polygon 8 appear to be attractants for amphibians and the primary habitat for frogs including over-wintering habitat.

It is also clear from these studies that those natural heritage features within the study area that are deemed to be significant woodland by the County of Grey, based on size and connection to large regional woodlands, do not support significant populations of frogs based on calling surveys. Frog calls were not heard during amphibian surveys in 2014 for these natural heritage features.

It should be noted that the only potential breeding habitat for amphibians is not found in any of the woodlands within the study area but only within the wetland areas of Polygon 5 and the pond east of polygon 8 which is beyond the study area limits including adjacent lands.

Conclusions

This document provides a comprehensive response to review comments of Amanda McLachlan, District Planner, and OMNR Midhurst (February 18, 2014). In order to respond accurately, appropriate and accurate field surveys were undertaken in the spring and summer of 2014 using the most current techniques and protocols as advocated by the OMNR. The finding of field surveys and further deliberation with regard to the potential impact of the proposed Bumstead Pit is that the proposed aggregate pit will have no net negative impact on natural heritage features within the proposed license area or on adjacent lands within 120 meters of the proposed license boundary.

We trust that the information contained within this document including appendices will satisfy the requirements of the OMNR as originally requested by Amanda McLachlan in the review comments of February 18, 2014. Should you require further information or clarification of any of the points addressed within this report or supporting information please contact me directly.

Best wishes,

AET CONSULTANTS INC.

A handwritten signature in black ink, appearing to read "Chris Hart". The signature is fluid and cursive, with a long horizontal stroke at the end.

Chris Hart, M.Sc., M.L.A., O.A.L.A., C.S.L.A.
Senior Ecologist Planner / Landscape Architect
Manager of Ecology Group

REFERENCES

- Austen, M.J., M.D. Cadman and R.D. James. 1994.
Ontario Birds at Risk: Status and Conservation Needs.
Federation of Ontario Naturalists and Long Point Bird Observatory, Ontario. 165 pp.
- Bakowsky, W.D. 1996 (Draft).
Natural heritage resources in Ontario: S-ranks for communities in Site Regions 6 and 7.
Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario.
- Bird Studies Canada. 2008.
Marsh Monitoring Program, Participant's Handbook for Surveying Amphibians.
Bird Studies Canada, Environment Canada, Marsh Monitoring Program, United States Environmental Protection Agency.
- Bollinger, E.K. and T.A. Gavin. 1992.
Eastern Bobolink populations: ecology and conservation in an agricultural landscape. Pages 497-506 in J.M Hagan, III and D.W. Johnston, editors. Ecology and conservation of Neotropical migrant landbirds. Smithsonian Institution Press, Washington, D.C.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001). This paper.
- Bollinger, E.K. 1991.
Conservation of grassland birds in agricultural areas. Pages 279 – 287 in D.J. Decker, M.E. Krasny, G. R. Goff, C.R. Smith and D.W. Gross, editors. Challenges in the conservation of biological resources. Westview Press, Boulder, Colorado.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001). This paper.
- Bollinger, E.K. 1988.
Breeding dispersion and reproductive success of Bobolinks in an agricultural landscape. Ph.D. dissertation. Cornell University, Ithaca, New York.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001). This paper.
- Boscolo, D., J. P. Metzger and J. m. E. Vielliard. December 2006.
Efficiency of playback for assessing the occurrence of five bird species in Brazilian Atlantic Forest fragments.
An. Acad. Bras. Cienc. Vol. 98 no. 4. Rio de Janeiro.
- Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (Eds.). 2007.
Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. Toronto, Ontario.
- Cadman, M.D. and N. Kopysh. February 2003.
Ontario Breeding Bird Atlas, Guide for Participants, Addendum. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. Toronto, Ontario.

- Cadman, M.D. and N. Kopysh. 2001.
Ontario Breeding Bird Atlas, Guide for Participants. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature. Toronto, Ontario.
- Cornell Lab of Ornithology. 2014.
<http://www.birds.cornell.edu/Page.aspx?pid=1478>
- Dechant, J. A., M. L. Sondreal, D. H. Johnson, L. D. Igl, C. M. Goldade, A. L. Zimmerman, and B. R. Euliss. 2003.
Effects of management practices on grassland birds: Bobolink.
Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife Research Center Online.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/bobo/bobo.htm> (Version 12DEC2003).
- Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001).
Effects of management practices on grassland birds: Bobolink.
Northern Prairie Wildlife Research Center, Jamestown, ND.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/bobo/bobo.htm>
- Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1998. (revised 2002).
Effects of management practices on grassland birds: Loggerhead Shrike.
Northern Prairie Wildlife Research Center, Jamestown, ND.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/losh/losh.htm>
- Farrar, J.L. 1995.
Trees in Canada.
Fitzhenry and Whiteside Limited and the Canadian Forest Service (Natural Resources Canada).
Markham, Ontario and Ottawa, Ontario.
- Gamsby and Mannerow Limited. September 2013.
Level 1 Hydrogeological Study, Proposed Aggregate Extraction Pit, 584015 Sideroad 60, Former Township of Holland, Township of Chatsworth.
- Gillespie, J.E. and N.R. Richards. January, 1954.
Soil survey of Grey County. Report no. 17 of the Ontario Soil survey.
Experimental Farms Service, Canada Department of Agriculture and the Ontario Agricultural College.
- Grey County. June 25, 2013.
Official Plan (Amended August 24, 2009).
- Gross, A. 1965.
Eastern Meadowlark. Pages 53 – 80 in Life Histories of North American blackbirds, orioles, tanagers, and allies. Dover Publications, Inc., New York, New York.
In: Hull, S.D. 2000. (revised 2002). This paper.

- Harding, J. H. 1997.
Amphibians and Reptiles of the Great Lakes Region.
The University of Michigan Press. Ann Arbor, Michigan.
- Herkert, J. R. 2003.
Effects of management practices on grassland birds: Henslow's Sparrow.
Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife
Research Center Online.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/hesp/hesp.htm> (Version 12DEC2003).
- Herkert, J.R. 1994.
The effects of habitat fragmentation on mid-western grassland bird communities. *Ecological
Applications* 4:461-471.
*In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman,
and B.R. Euliss. 1999. (revised 2001). This paper.*
- Herkert, J. R. 1991.
An ecological study of the breeding birds of grassland habitats within Illinois. Ph.D.
dissertation. University of Illinois, Urbana, Illinois.
- Herkert, J. R. 1991.
Prairie birds of Illinois: population response to two centuries of habitat change.
Illinois Natural History Survey Bulletin 34:393-399.
- Hightshoe, G.L. 1988.
Native Trees, shrubs, and Vines for Urban and Rural America: A Planting Design Manual for
Environmental Designers.
Van Nostrand Reinhold. New York, N.Y.
- Hughes, J.M. 2001.
The ROM Field Guide to birds of Ontario.
Royal Ontario Museum and McClelland and Stewart Ltd. Toronto, Ontario.
- Hull, S. D. 2003.
Effects of management practices on grassland birds: Eastern Meadowlark.
Northern Prairie Wildlife Research Center, Jamestown, ND. Northern Prairie Wildlife
Research Center Online.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/eame/eame.htm> (Version 12DEC2003).
- Hull, S.D. 2000. (revised 2002).
Effects of management practices on grassland birds: Eastern Meadowlark.
Northern Prairie Wildlife Research Center, Jamestown, ND.
<http://www.npwr.usgs.gov/resource/literatr/grasbird/eame/eame.htm>
- Jagger Hims Limited, Skelton Brumwell and Associates Ltd., ESG International, C.N. Watson
Ltd. October , 2004. Aggregate Resource Inventory Master Plan.

- Joyner, D.E. 2001.
Use of an old field habitat by Bobolinks and Red-winged Blackbirds.
Canadian Field Naturalist 92:383-386.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001). This paper.
- Kaseloo, P. A. 2005. Synthesis of noise effects on wildlife populations. Road Ecology Center. University of California.
- Larsen, B.M., J. Riley, E. Snell and H. Godschalk. 1999.
Woodland Heritage of Southern Ontario: A Study of Ecological Change, Distribution and Significance. Federation of Ontario Naturalists. Toronto, Ontario.
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998.
Ecological Land Classification for Southern Ontario: First Approximation and Its Application. OMNR, South Central Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. North Bay, Ontario.
- Morrison, M.L. 2002.
Wildlife Restoration, Techniques for Habitat Analysis and Animal Monitoring.
Society for Ecological Restoration and Island Press. Washington, D.C.
- Ontario. 2009.
Aggregate Resources Act. (R.S.O. 1990, Chapter A.8, Consolidated December 15, 2009.)
- Ontario. 2007.
Endangered Species Act, 2007, S.O. 2007, Chapter 6.
(Consolidation Period: June 30, 2008 to June 11, 2012).
- Ontario Field Ornithologists. October 2014.
OFO Code of Ethics.
www.ofo.ca
- Ontario Ministry of Municipal Affairs and Housing, 2014.
Provincial Policy Statement. Queen's Printer for Ontario.
- OMNR. 2014.
Butternut Tree Ontario Species At Risk, A Landowner's Resource Guide.
Environment Canada, Forest Gene Conservation Association, Ontario Ministry of Natural Resources.
- OMNR. 2013.
Bobolink Survey Methodology, Draft for Discussion Purposes Only.
Provided by Amanda McLachlan, OMNR District Planner in 2013.

OMNR. 2012.

Draft Significant Wildlife Habitat Ecoregion Criteria Schedule. SWH Ecoregion 6E Criterion Schedule. Identification of Significant Wildlife Habitat.

OMNR. February, 2012.

Species at Risk in Grey County. (Provided by Amanda McLachlan, OMNR Midhurst District)

OMNR. Natural Heritage Information Centre. 2012.

Biodiversity Explorer - Element Occurrence and Natural Areas Data.

OMNR. Natural Heritage Information Centre. 2012.

Biodiversity Explorer – Species Element Report for Dolichonyx oryzivorus (Bobolink).

<https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/speciesDetailReport.do?eIID=180471>[9/11/2012 1:38:44 PM]

OMNR. Natural Heritage Information Centre. 2012.

Biodiversity Explorer – Species Element Report for Sturnella magna (Eastern Meadowlark)

<https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/speciesDetailReport.do?eIID=180473>[9/11/2012 1:40:32 PM]

OMNR. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario.

OMNR. 2009. Significant Wildlife Habitat Ecoregion Criteria Schedules - Schedule 2: Ecoregion 6E Criteria (Working Draft).

OMNR. July 22, 2008.

SAR policy 4.1, Habitat protection for endangered, threatened and extirpated species under the Endangered Species Act, 2007.

Ministry of Natural Resources, Species at risk Section, Fish and Wildlife Branch, Natural Resources Management Division. Peterborough, Ontario.

OMNR. March 15, 2006.

Aggregate Resources Program Policies and Internal Procedures Manual.

<http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@aggregates/documents/document/266793.pdf>

OMNR. 2000. Significant Wildlife Habitat Technical Guide.

Ontario Ministry of Natural Resource, Fish & Wildlife Branch - Wildlife Section.
Peterborough, Ontario.

- OMNR, Natural Resource Management Division. June 1, 1997.
Aggregate Resources Provincial Standards. Aggregate Licenses (Private Land, Designated Areas). Provincial Standards of Ontario – Category 3 – Class A Pit Above Water.
http://www.mnr.gov.on.ca/en/Business/Aggregates/Publication/STEL02_173877.html
- Ontario Nature. 2011. Ontario Reptile and Amphibian Atlas.
Ontario Nature. Toronto, Ontario.
http://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php
- Peterson, R.T. 2010.
Peterson Field guide to Birds of Eastern and Central North America.
Houghton Mifflin Harcourt. New York, N.Y.
- Riley, J. L. and P. Mohr. 1994.
The Natural Heritage of Southern Ontario's Settled Landscapes, A review of conservation and restoration ecology for land-use and landscape planning.
Ontario Ministry of Natural Resources, Southern Region, Aurora, Science and Technology Transfer, Technical Report TR-001.
- Schroeder, R.L. and P.J. Sousa. 1982.
Habitat Suitability Index: Eastern Meadowlark. FWS/OBS 82/10. U.S. Fish and Wildlife Service.
In: Hull, S.D. 2000. (revised 2002). This paper.
- Sibley, D. April 7, 2011.
The Proper Use of Playback in Birding.
<http://www.sibleyguides.com>
- Skinner, R.M. 1975.
Grassland use patterns and prairie bird populations in Missouri. Pages 171-180 in M.K. Wali, editor. Prairie: a multiple view. University of North Dakota Press, Grand Forks, North Dakota.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (revised 2001). This paper.
- Skinner, R.M. 1974.
Grassland use patterns and prairie bird populations in Missouri. M.A. thesis.
University of Missouri, Columbia, Missouri.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman, and B.R. Euliss. 1999. (Revised 2001). This paper.

Skinner, R.M. 1967.

Bird populations in fields of Ontario County, 1965. Canadian Field-Naturalist 81:175-183.
In: Dechant J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, A.L. Zimmerman,
and B.R. Euliss. 1999. (revised 2001). This paper.

Soper, J.H., and M.L Heimburger. 1982.

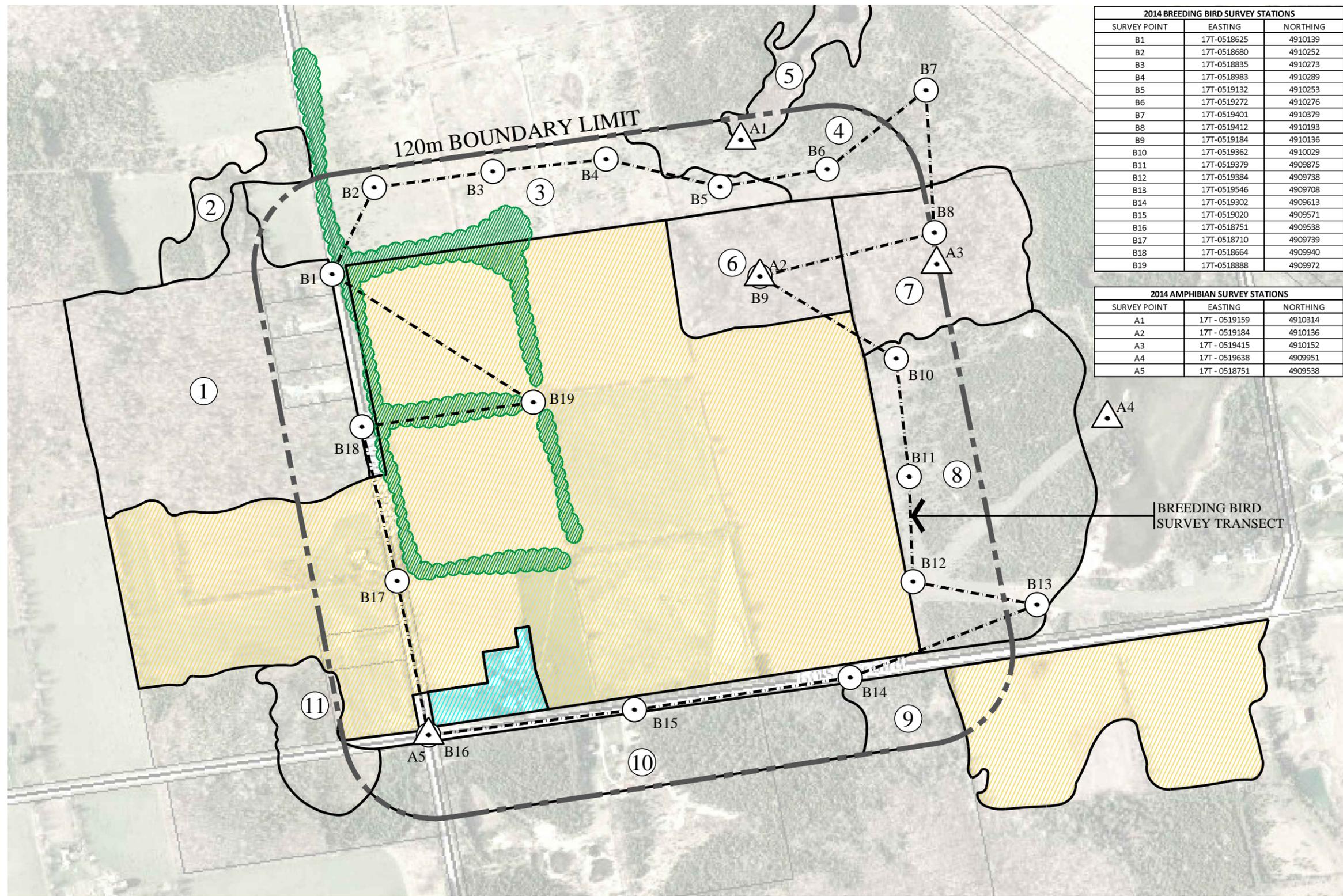
Shrubs of Ontario.

The Royal Ontario Museum. Toronto, Ontario.

Waterloo Hydrogeologic Inc. July, 2003.

Grey and Bruce Counties Groundwater Study, Final Report.

FIGURE 1



2014 BREEDING BIRD SURVEY STATIONS		
SURVEY POINT	EASTING	NORTHING
B1	17T-0518625	4910139
B2	17T-0518680	4910252
B3	17T-0518835	4910273
B4	17T-0518983	4910289
B5	17T-0519132	4910253
B6	17T-0519272	4910276
B7	17T-0519401	4910379
B8	17T-0519412	4910193
B9	17T-0519184	4910136
B10	17T-0519362	4910029
B11	17T-0519379	4909875
B12	17T-0519384	4909738
B13	17T-0519546	4909708
B14	17T-0519302	4909613
B15	17T-0519020	4909571
B16	17T-0518751	4909538
B17	17T-0518710	4909739
B18	17T-0518664	4909940
B19	17T-0518888	4909972

2014 AMPHIBIAN SURVEY STATIONS		
SURVEY POINT	EASTING	NORTHING
A1	17T-0519159	4910314
A2	17T-0519184	4910136
A3	17T-0519415	4910152
A4	17T-0519638	4909951
A5	17T-0518751	4909538



POLYGON No.

① FOD 5-4	⑥ FOD 5-4
② COP 3-4	⑦ FOD 5-4
③ COM1	⑧ COP 3-4
④ COP 3-4	⑨ FOM
⑤ SWD	⑩ COP 3-4
	⑪ SWM

LANDUSE

	CROPLAND
	FARMSTEAD
	HEDGEROW

SURVEY STATIONS

	B9 BREEDING BIRD
	SURVEY TRANSECT
	A1 AMPHIBIAN

Project Title:
BUMSTEAD PIT

TOWNSHIP OF CHATSWORTH

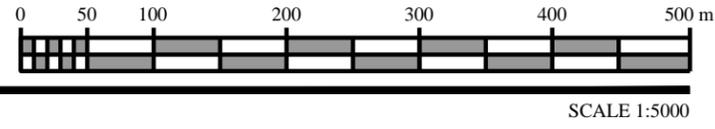
Sheet Title:
BREEDING BIRD/ AMPHIBIAN SURVEY LOCATIONS

Date: 10.10.14	Project No: 13495
-------------------	----------------------

	Figure: 1
--	---------------------

A LAND USE / ECOLOGICAL LAND CLASSIFICATION FEATURES

1



aet

531 Wellington St. North
Waterloo, Ontario, N2H 5L6
Tel (519) 576-9723
Fax (519) 570-9589
www.aet-consultants.com

TABLE 2 – BREEDING BIRDS – JUNE/JULY 2014

BUMSTEAD PIT (10_09_14)		Rarity/Status ¹			Species Sensitivity	Wildlife Occurrences - (POLYGON NO.)													Breeding Evidence
BREEDING BIRDS - June and July 2014		National	Provincial			ELC Feature or Site Area													
Common Name	Scientific Name	COSEWIC	NHIC	MNR		1	2	3	4	5	6	7	8	9	10	11	HR	CL	
American Crow	<i>Corvus brachyrhynchos</i>		S5B		non sens.	X	X	X	X	X	X	X	X	X		X	X	X, S	
American Goldfinch	<i>Spinus tristis</i>		S5B		non sens.	X		X	X	X		X		X	X	X	X	P, S, T	
American Robin	<i>Turdus migratorius</i>		S5B		non sens.	X	X	X	X		X		X	X	X	X		S, T	
Black-capped Chickadee	<i>Poecile atricapillus</i>		S5		non sens.	X	X	X	X	X		X	X	X	X	X		S, T	
Blue Jay	<i>Cyanocitta cristata</i>		S5		non sens.	X	X	X	X		X	X	X	X	X	X		S, T	
Blue-winged Warbler	<i>Vermivora cyanoptera</i>		S4B		non sens.				X		X							S, T	
Brown-headed Cowbird	<i>Molothrus ater</i>		S4B		non sens.					X	X			X	X			S	
Brown Thrasher	<i>Toxostoma rufum</i>		S4B		non sens.							X						X, S	
Canada Goose	<i>Branta canadensis</i>		S5B		non sens.												X	S	
Cedar Waxwing	<i>Bombycilla cedrorum</i>		S5B		non sens.									X	X	X		S	
Chesnut-sided Warbler	<i>Setophaga pensylvanica</i>		S5B		non sens.						X	X						S, T	
Chipping Sparrow	<i>Spizella passerina</i>		S5B		non sens.			X	X		X		X	X	X	X		N, S, T	
Common Grackle	<i>Quiscalus quiscula</i>		S5B		non sens.		X					X	X	X	X	X		S, T	
Common Yellowthroat	<i>Geothlypis trichas</i>		S5B		non sens.										X			S	
Downy Woodpecker	<i>Picoides pubescens</i>		S5		non sens.	X												S	
Eastern Bluebird	<i>Sialia sialis</i>	NAR	S5B	NAR	non sens.							X				X		S	
Eastern Kingbird	<i>Tyrannus tyrannus</i>		S4B		non sens.			X	X			X				X		S, T	
Eastern Phoebe	<i>Sayornis phoebe</i>		S5B		non sens.	X												S	
Eastern Towhee	<i>Pipilo erythrophthalmus</i>		S4B		non sens.			X	X			X						S, T	
Eastern Wood-Pewee	<i>Contopus virens</i>		S5B		non sens.	X				X	X							S	
European Starling	<i>Sturnus vulgaris</i>		SNA		non sens.							X	X	X		X		S	
Field Sparrow	<i>Spizella pusilla</i>		S4B		non sens.			X	X	X	X			X	X	X		P, S, T, A	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		S4B		non sens.			X	X		X	X		X				S	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>		S4B		non sens.			X										S	
Gray Catbird	<i>Dumetella carolinensis</i>		S4B		non sens.	X	X	X			X	X	X		X	X		S, T	
House Wren	<i>Troglodytes aedon</i>		S5B		non sens.	X		X				X		X		X		S	
Indigo Bunting	<i>Passerina cyanea</i>		S4B		non sens.	X			X			X		X		X		S, T	
Killdeer	<i>Charadrius vociferus</i>		S5B		non sens.												X	S, A	
Mourning Dove	<i>Zenaida macroura</i>		S5		non sens.	X	X		X					X	X	X	X	S, T, P	
Northern Cardinal	<i>Cardinalis cardinalis</i>		S5		non sens.										X	X		S	
Northern Flicker	<i>Colaptes auratus</i>		S4B		non sens.				X	X	X	X						S	
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>		S5B		non sens.							X					X	S	
Oven Bird	<i>Seiurus aurocapilla</i>		S4B		non sens.					X	X	X						S, T	
Red-eyed vireo	<i>Vireo olivaceus</i>		S5B		non sens.	X				X	X	X						S, T	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>		S4		non sens.		X	X	X	X		X		X	X	X		S, T	
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>		S4B		non sens.			X		X								X	
Savannah Sparrow	<i>Passerculus sandwichensis</i>		S4B		area sens.			X								X	X	T	
Song Sparrow	<i>Melospiza melodia</i>		S5B		non sens.	X		X	X	X		X	X	X	X	X		S, T, A	
Swamp Sparrow	<i>Melospiza georgiana</i>		S5B		non sens.			X	X				X	X				T	
Tree Swallow	<i>Tachycineta bicolor</i>		S5B		non sens.							X					X	X	
Turkey Vulture	<i>Cathartes aura</i>		S5B		non sens.							X					X	S	
Warbling Vireo	<i>Vireo gilvus</i>		S5B		non sens.	X		X		X	X					X		S	
Wild Turkey	<i>Meleagris gallopavo</i>		S5		non sens.			X									X	S	
Yellow Warbler	<i>Setophaga petechia</i>		S5B		non sens.									X	X			S	

OMNR BOBOLINK SURVEY METHODOLOGY

DRAFT FOR DISCUSSION PURPOSES ONLY



Bobolink Survey Methodology

Conditions: Surveys need to be done under field conditions with no precipitation, no or low wind speed and good visibility. In the course of the surveys if a nest or probable nest is encountered, the surveyor is advised not to disturb it or search an area for nests. Surveys rely on observations of birds while walking along transects through the fields.

Qualifications: Observers should be familiar with Bobolink identification by sight and sound. This includes being able to separate males from females and knowledge of Bobolink and their behaviours during breeding to allow it to be categorized (e.g. singing male, pair in suitable habitat, carrying food or nesting material, foraging, territorial displays, recently fledged young). See the Ontario Breeding Bird Atlas for additional behaviour categories.

Pre-Survey: Set up parallel transects crossing the fields lengthwise at approximately 250 m intervals and locate point counts along the transects at 250 m intervals. The locations of point count along the transects may be staggered by up to 125 m to give the best surveying opportunities. Point

counts should be located to give a good view of the surrounding fields. Create GPS locations for each point count. Materials needed for the survey include binoculars, notebook, GPS, compass, watch and camera.

Survey: Surveys should start at dawn and continue until no later than 9 am. The observer will walk the transect stopping at each point count. Undertake ten minutes of observations and listening at each point count. Record information on all Bobolink observed or heard, their sex, general location, direction, distance, behaviour and interactions with other Bobolink or other species. On transit between point counts, record any Bobolink observed or heard if not also seen on the point counts. Nest searches should be avoided.

Repeat visits: Complete at least three sets of point count surveys. These should take place between the last week of May and the first week of July with each survey separated by a week or more from previous surveys.

Habitat: Make notes on the general conditions of the fields at the locations where Bobolink are noted. These would include broad habitat descriptors (e.g. field, hedgerow, fence line), estimated height of the vegetation, general vegetation type (including predominate species if known), estimated percentage of grass versus broad-leaved plants, and presence of litter (i.e. thatch). It is best if the surveyor evaluates the locations from the transect or close to the transect rather than walking directly into the area where the Bobolink were found. Photos should be taken.

Bobolink Survey Methodology

Conditions: Surveys need to be done under field conditions with no rain, no or low wind speed and good visibility. In the course of the surveys if a nest or probable nest is encountered, the surveyor is advised not to disturb it or search an area for nests. Surveys rely on observations of birds while walking along transects through the fields.

Qualifications: Observers should be familiar with Bobolink identification by sight and sound. This includes being able to separate males from females and knowledge of Bobolink behaviour during breeding to allow it to be categorized (e.g. singing, carrying food or nesting material, foraging, territorial displays).

Pre-Survey: Set up parallel transects crossing the fields lengthwise at approximately 250 m intervals and locate point counts along the transects at 250 m intervals. Point counts should be located to give a good view of the surrounding fields. Create GPS locations for each point count. Materials needed for the survey include binoculars, notebook, GPS, compass, watch and camera.

Survey: Surveys should start 30 minutes after dawn and continue until no later than 9 am. The observer will walk the transect stopping at each point count. Undertake ten minutes of observations and listening at each point count. Record information on all Bobolink observed or heard, their sex, direction, distance, behaviour and interactions with other Bobolink or other species. On transit between point counts, record any Bobolink observed or heard if not also seen on the point counts.

Repeat visits: Complete at least three sets of point count surveys. These should take place in June or the first week of July with each survey separated by a week or more from previous surveys.

Habitat: Make notes on the general conditions of the fields at the locations where Bobolink are noted. These would include broad habitat descriptors (e.g. field, hedgerow, fence line), estimated height of the vegetation, general vegetation type (including predominate species if known), estimated percentage of grass versus broad-leaved plants, and presence of litter (i.e. thatch). It is best if the surveyor evaluates the locations from the transect or close to the transect rather than walking directly into the area where the Bobolink were found. Photos should be taken.