NATURAL ENVIRONMENT TECHNICAL REPORT: LEVEL I and II ELGINBURG QUARRY

City of Kingston

Aggregate Extraction Application: Quarry Expansion

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FINAL

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SUMMARY

This technical report has been produced on behalf of Cruikshank Construction Ltd. who are making an application to expand their existing Unity Rd. quarry in two phases (see Figure 1). This report follows the guidelines provided in the *Aggregate Resources Policy Manual* for a Level 1 Technical Report, which investigates whether or not significant natural heritage features are on or within 120 meters of a proposed project.

The proposed expansion lands are bordered on the north by Unity Rd., on the east by existing quarry, on the west by woodland and active and abandoned farmland, and on the south by the K&P rail trail, woodland, and farmland. The expansion lands contain some woodland, but are mostly comprised of shrub and thicket habitat.

Significant natural heritage features were not found on the proposed expansion lands. There may be Butternut trees in the adjacent lands to the west, and there is woodland with some value in the adjacent lands to the south that may also contain snake hibernacula. A Level II assessment is included in this report to address these features, along with mitigation recommendations.

Access for investigations on adjacent private lands was limited; however mapping of these lands was based on the assumption that ecological types were contiguous across the landscape. We also flew over the site and examined the adjacent properties from the air.

Cultural constraints include a gas pipeline, a hydro corridor, adjacent landowner dwellings, and an adjacent landowner that uses their lot to store cast-off vehicles and other material.

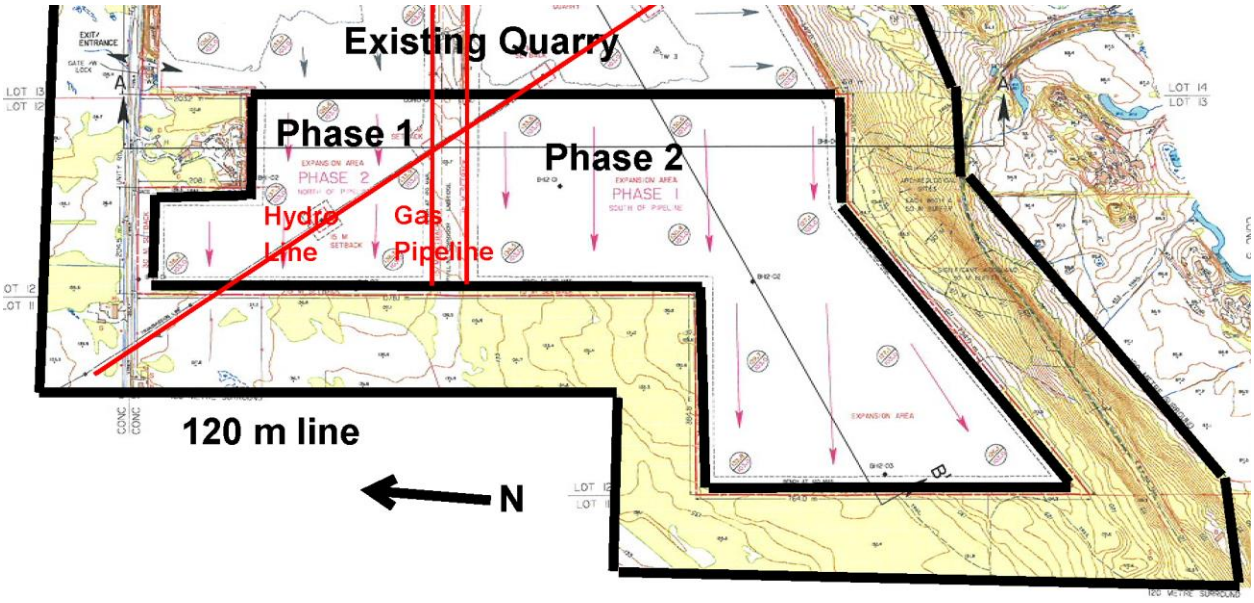

Figure 1. Proposed expansion area with 120 m adjacent lands line.

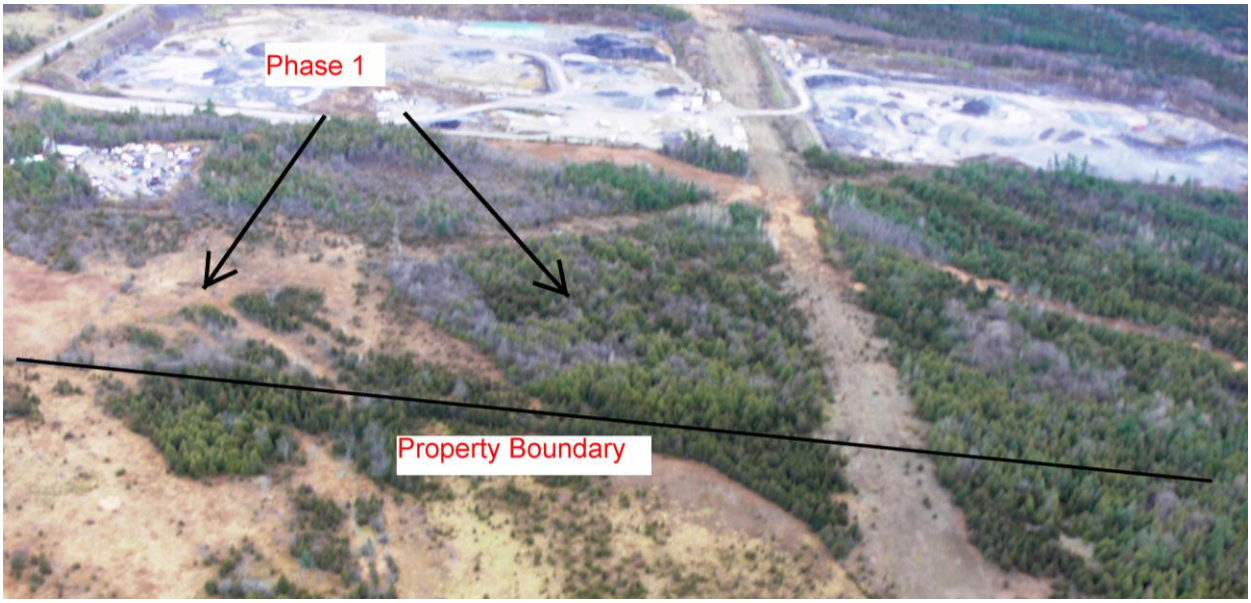

Figure 2. Phase 1 expansion area next to Unity Rd. Photo taken in 2010.

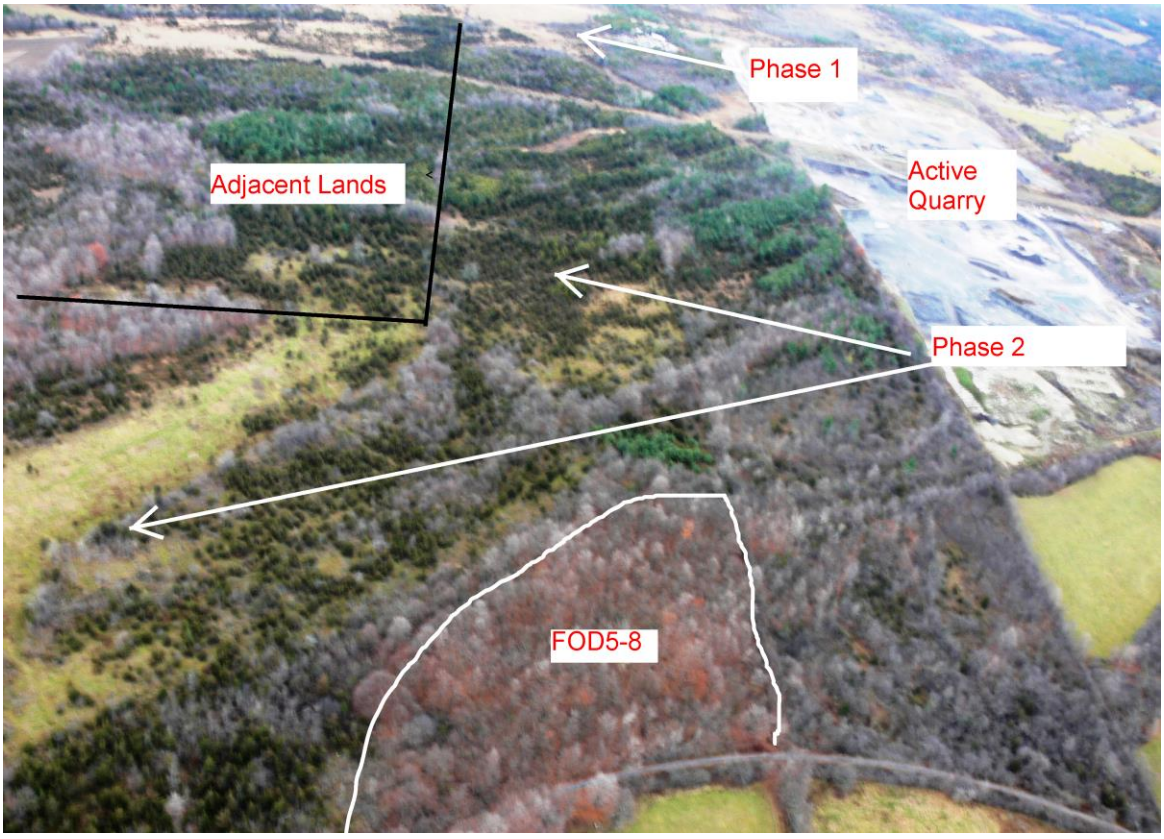

Figure 3. Phase 2 expansion area. Photo taken in 2010.

POLICY

Aggregate Resources Policy (from Manual for the *Aggregate Resources Act***)**

Policy 2.01.07 Policy License Applications: Natural Environment Report Standards

"A Natural Environment Level 1 report determines whether one or more of the following features exist on-site or within 120 metres of the site:

a) significant wetlands (including significant coastal wetlands);
b) significant habitat of endangered and threatened species;
c) significant Areas of Natural and Scientific Interest (ANSIs);
d) significant woodlands (south and east of the Canadian Shield);
e) significant valleylands (south and east of the Canadian Shield);
f) significant wildlife habitat; and
g) fish habitat.

…… this policy deals in a summarized fashion with the contents of the Provincial Policy Statement 2014 and should not be relied on as a substitute for the PPS.

The Level 1 report must clearly conclude whether each of the features (a-g, above) exists on or within 120m of the site.

If any of these features are identified, then an impact assessment (i.e. Natural Environment Level 2 report) is required to determine any negative impacts on the natural features or ecological functions, and any proposed preventative, mitigative or remedial measures.

Provincial Planning Policy

Issued under Section 3 of the *Planning Act*, Section 2.1 of the Provincial Policy Statement (PPS) requires that municipalities consider natural heritage features in assessing development proposals. Guidance on the extent of adjacent lands is provided in a Natural Heritage Reference Manual (OMNR 2010). The adjacent land width for significant natural heritage features is 120 m. From the Policy:

2.1.3 *Development* and *site alteration* shall not be permitted in:

a) *significant* habitat of *endangered species* and *threatened species*;
b) *significant wetlands* in Ecoregions 5E, 6E and 7E; and

2.1.4 *Development* and *site alteration* shall not be permitted in:

b) *significant woodlands* south and east of the Canadian Shield;
c) *significant valleylands* south and east of the Canadian Shield;
d) *significant wildlife habitat*; and
e) *significant areas of natural and scientific interest*

2.1.5: *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

2.1.6: *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas ... unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

Adjacent lands are defined in the PPS:
"…*those lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area*…"

Guidance on the extent of adjacent lands is provided in a Natural Heritage Reference Manual (OMNR 2010), which lists an adjacent land width of 120 m for all significant heritage features.

METHODOLOGY

The determination of significant natural heritage features and functions was determined by site visits between August 2010 and January 2014. Field inventories were carried out by Rob Snetsinger and Chris Grooms. We have also undertaken an environmental assessment for a previous expansion of this quarry property in 2006 (see Snetsinger 2006). Information on potential rarities was provided by the NHIC Element Occurrence web page. Information on potential significant woodlands and valleylands was provided by Schedule 8A in the City of Kingston Official Plan. ANSI and wetland records for the region were also consulted.

Natural features, significant wildlife habitat (as described in OMNR 2012), and species of conservation were considered during the site investigation. Site investigators, photos, dates, survey times, weather conditions, and observations were recorded. Species were identified by common name, which are written according to the standard rule of lower-case letters for all species excluding birds and proper nouns, in which case it is capitalized (e.g. woodland vole, Blanding's turtle, and Black Tern). The binomial nomenclature system is a standard method used to formulate the scientific name of an organism (e.g. *genus* name + *species* name). Scientific and common names used in this report follow those used by the MNR.

The site investigation was completed in part to verify the presence and/or absence of significant natural features and species of conservation concern. The methodology used during the site investigation involved walking the site (covered in straight line 10 m wide transects) by foot and documenting the natural features (including wildlife habitat), plant and wildlife species. A search for species of conservation concern was also completed at the appropriate time of year. Habitat communities are described following the methodology outlined in the ELC for Southern Ontario (Lee *et al*., 1998) and if applicable, the *Ontario Wetland Evaluation System Southern Manual* (MNR 2002). Photographs of the site were also taken to document natural features observed during the site investigation.

Assessment of significant natural features followed the criteria outlined in the Natural Heritage Reference Manual (MNR 2010), Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR 2012) and Significant Wildlife Habitat Technical Guide (MNR 2000).

Breeding bird surveys followed methods described in the Ontario Breeding Bird Atlas Guide for Participants (Cadman and Kopysh, 2001) and the Canadian Wildlife Service Forest Bird Monitoring Program. Bobolink and Eastern Meadowlark surveys followed Bobolink Survey Methodology (OMNR 2011), and Whip-poor-will using OMNR (2012) Whip-poor-will Survey Methodology.

The presence of amphibians was assessed by examining areas of appropriate habitat and monitoring evening calls in the spring. Incidental signs of herpetofauna were to be recorded as encountered during all site visits. The presence of reptiles was assessed by examining areas of appropriate habitat such as rock piles, exposed escarpment, and potential basking sites (logs, exposed bedrock).

For snakes, cover boards made of roofing metal (about 1' x 4') were placed near wet areas and checked during each visit. As well rocks, logs, and castoff lumber was overturned and shrubby areas were beaten to flush out snakes. Prospective habitats where checked in ransects extending the length of the potential habitat, as well as looking for congregations on sunny, warm days in both the spring (April-May) or in fall (Sept-Oct).

Other wildlife species of interest (e.g., butterflies, mammals) would be noted as encountered from direct observation, or from other signs of their presence (tracks, scat, den sites, etc.).

Vascular plant species were used to characterize ELC community types. Species of conservation concern would be GPS referenced and the habitat surveyed in order to determine the extent of the population. If specimens could not be identified in the field they would be assessed later using appropriate references (e.g., Gleason and Cronquist 1991; Queen`s University Fowler Herbarium records).

Date of Survey	Starting Time	Weather Conditions	Surveyor	Main Purpose of Visit
Aug. 30, 2010	8:30	22 C, clear	Rob Snetsinger Chris Grooms	Multiple species. Site overview.
Sept. 11, 2010	8:00 1200	20 C, clear	Rob Snetsinger Chris Grooms	Bird, Vegetation, Herps
Sept. 25, 2010	830	17 C, clear	Rob Snetsinger	Bird, Vegetation, Herps
Feb. 12, 2011	1200	-7 C, clear	Rob Snetsinger	Winter use survey
May 4, 2011	730	7 C, clear	Rob Snetsinger	Bird, Herps, and Vegetation
May 21, 2011	700	15 C, clear	Rob Snetsinger	Bird, Herps, and Vegetation
June 5, 2011	600	16 C, clear	Rob Snetsinger	Bird, Herps, and Vegetation
June 16 2011	700	20 C, clear	Chris Grooms,	Bird and Herps
May 7, 2012	2200	7 C, clear	Rob Snetsinger	Evening birds, bat, and herps
May 10, 2012	2230	7 C, clear	Rob Snetsinger	Evening birds, bat, and herps
May 15, 2012	710	16 C, clear	Rob Snetsinger	Turtle, herps, and vegetation

May 28, 2012	2200	19 C, clear	Rob Snetsinger	Bat and herps
June 4, 2012	2200	14 C, clear	Rob Snetsinger	Evening birds, bat, and herps
Oct 17, 2012	845	14 C, clear	Rob Snetsinger Tom Beaubiah (CRCA)	Vegetation assessment
Feb 17, 2013	1100	-15 C, clear	Rob Snetsinger	Winter use survey
May 31, 2013	2300	14 C Clear	Rob Snetsinger	Evening birds
June 20, 2013	100	18 C, clear	Rob Snetsinger	Birds
July 16, 2013	2300	20 C, clear	Rob Snetsinger	Evening Birds
Feb. 16 2014	1300	-5 C, clear	Rob Snetsinger	Winter use survey

SITE DESCRIPTION - ECOLOGICAL LAND CLASSIFICATION (ELC)

The minimum area for an ELC site is 0.5 hectares. This was applied where possible, but as is typical, there were instances where different vegetative patches would diffusely exist within a larger ELC type. In these cases, only the dominant ELC designation was considered.

The proposed expansion area has primarily been used as farmland, but also contained a conifer plantation. A review of 1950's aerial photographs reveals the farmland to be mostly pasture and hayfields (see Fig 4). Presumably the soils were not appropriate for cash crops. Between the mid 1960's and 1978 it is apparent in the photographic record that extensive soil removal was undertaken. This may have been to support the construction of nearby Hwy. 401. It is known that soil removal was undertaken at other sites nearby for this purpose. Evidence of past soil scraping to limestone pavement is still present.

This removal to bedrock would have affected the future ecological character of the site. The process of field succession normally seen on abandoned pasture, whereby fields usually go from shrubland and then to forest, instead would have been a transition primarily to just shrubland, and predominately Red Cedar shrubland (see Figure 5). We have observed similar Red Cedar succession at several other sites in the region where soil was removed. The description of the various ELC codes in Figure 5 is provided below.

Wildlife species use throughout was low in both numbers and diversity and was mostly comprised of species normally associated with near urban sites.

Cultural Meadow (CUM): This term applies to fields that result from, or are maintained by cultural disturbances. As such they are usually considered to have relatively low ecological value. To be designated a meadow, trees or shrubs may be present, but must be less than 25% coverage. We could find no evidence of soil removal in the cultural meadow in Figure 5 and it does have deeper soils in comparison to other sites on the property. That these fields have not succeeded into forest may be due to a more recent agricultural abandonment. Species present are typical of meadows in the region including a mix of common grass species such as *Bromus inermis* and *Poa pratensis*. Common perennial forbs are also present such as Goldenrods, Asters, Clovers, and Wild Carrot. Alfalfa is also a common ground cover and the invasive non-native Dog Strangling Vine is spreading in from the edges (see Fig.6).

Cultural Thicket (CUT): This term applies to woody areas that have greater than 25% shrub coverage, but less than 25% tree coverage. There is debate on how to define a tree for ELC designation. We applied two criteria: height and species composition. If the species present was a recognized tree species (e.g., Red Cedar), we used a height minimum of 4 meters. For example, an area dominated by Red Cedar saplings of 2 meters in height would be considered a thicket, but if the saplings were 4 or more meters, the area would be considered woodland. At many sites there was a diffuse mix of heights and it was difficult to separate Red Cedar woodland from Red Cedar thicket. As such, they were lumped together. The ground cover in these thicket/woodlands was usually sparse due to the shallow soils and dense cedar growth, but did include a mix of wasteland species such as Alfalfa, Wild Carrot, Strawberry, Goldenrods, Asters, and grasses. In some locations *Solidago ptarmicoides* was present, which can be an alvar indicator, but it is also an indicator of poor fields. These sites were not considered to be alvar due to a lack of alvar indicators, the ongoing succession to Cedar woodland, and the artificial reason for the shallow soils.

Other cultural thickets in the expansion area were dominated by deciduous shrubs such as European Buckthorn, Prickly Ash, Grey Dogwood, and Tartarian Honeysuckle. Dog Strangling Vine was also prevalent. There were also areas where Red Cedar thicket and deciduous shrub thickets graded into each other.

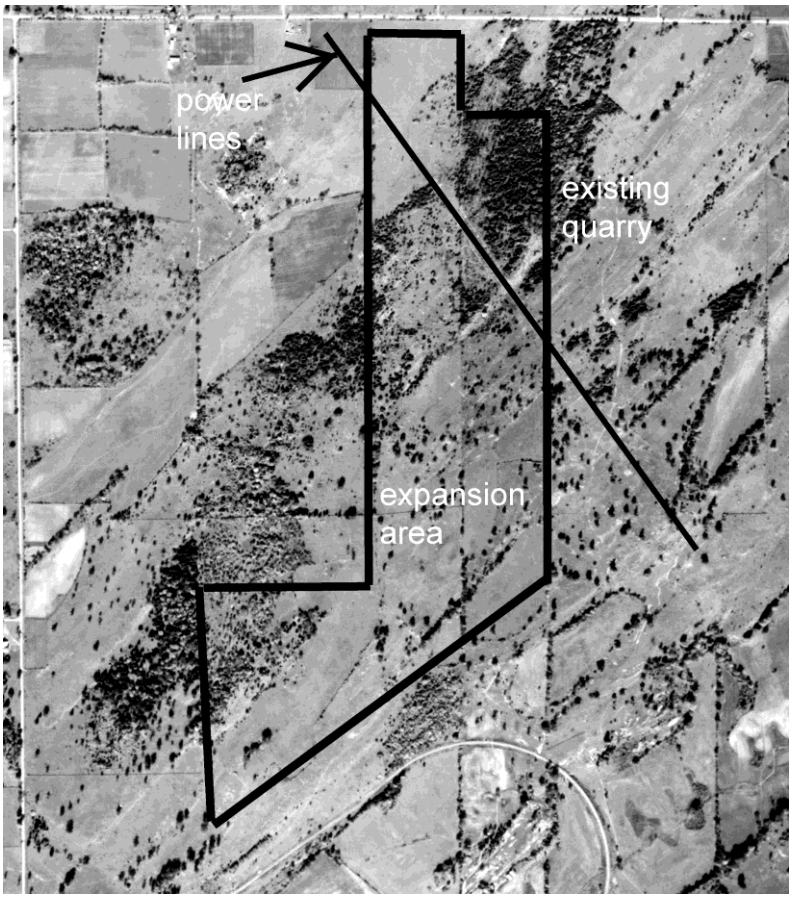

Figure 4. Photo from 1952 showing the landscape of the approximate proposed quarry expansion area.

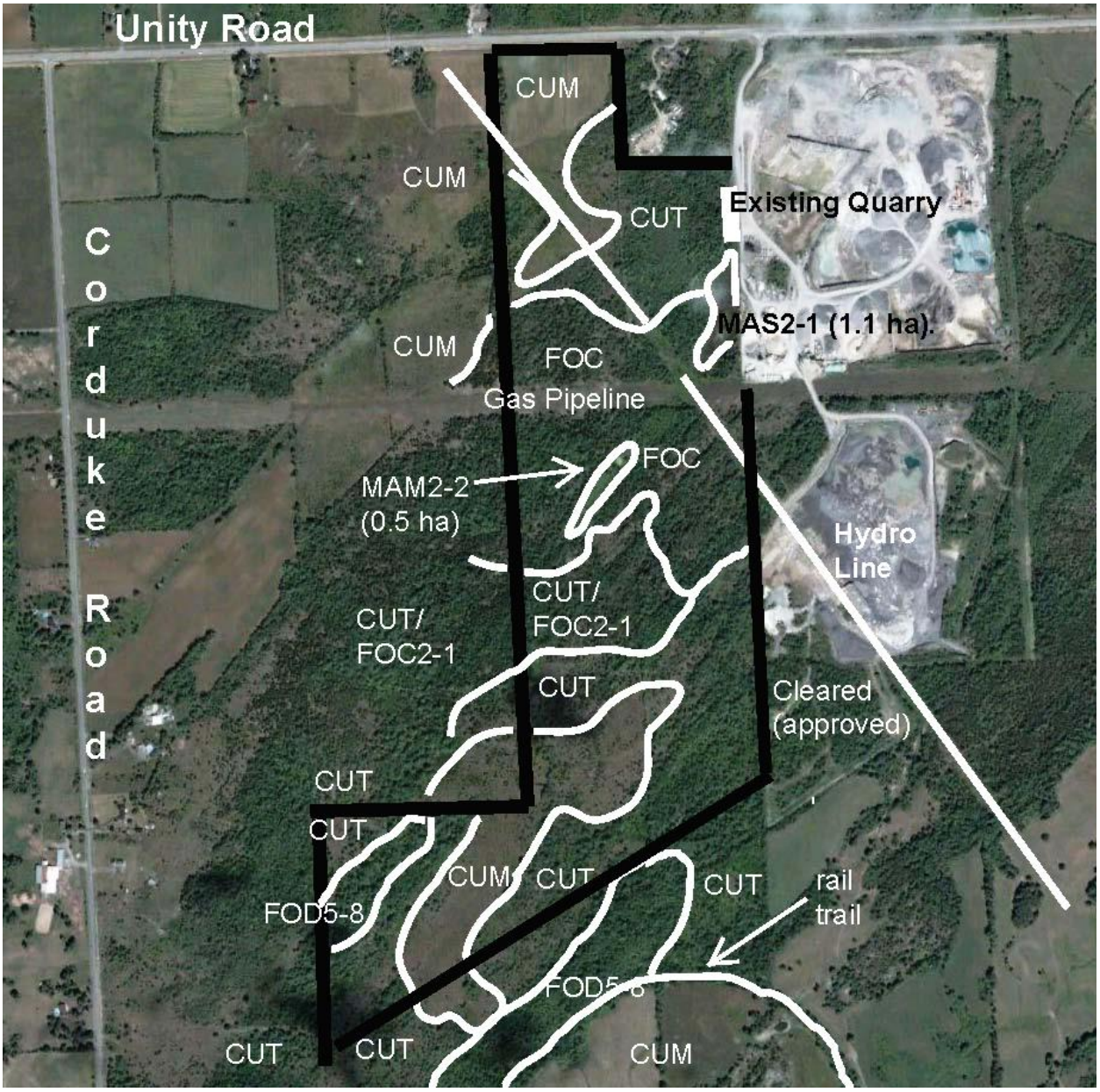

Figure 5. Ecological Land Classification, with the approximate proposed expansion area outlined in black.

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Figure 6. Dog Strangling Vine at the edge of one of the fields. Most of the woody vegetation in the background is European Buckthorn.

Dry-Fresh Sugar Maple – White Ash Deciduous Forest Type (FOD5-8). This is one of the most common forest types in Kingston and the surrounding regions. It is also commonly found in association with disturbed or managed sites, and is one of the main forest types succeeding on the many farms that were abandoned after initial land clearing in the late 1800's. As the name implies, Sugar Maple is the dominant tree in the overstory, with lesser amounts of White Ash. Other trees are also present, albeit in lower numbers such as Oaks, Hickories, and Ironwood. Vertical diversity (i.e., shrub and sapling growth) in the understory is mostly sparse. Ground cover is also relatively sparse, but the plants are typical and include spring ephemerals such as Dog Tooth Violet, White Trillium, and Hepatica.

The average age of the top canopy trees is in the 80 year range. There are two FOD5-8 woodlots within the expansion area. Both grade into shrubland. The woodlot on the south border is about 2 ha. in size and slopes down to the K&P trail. The woodlot on the west border is more fragmented, disturbed, and narrow and is about 1 ha. in size.

Dry-Fresh Red Cedar Coniferous Forest Ecosite. FOC2-1. This woodland type was found in the middle portion of the quarry expansion area in association with fields and deciduous thickets. Red Cedar stands such as this tend to have low understory diversity because the dense canopy reduces the amount of available sunlight for ground cover species. Figure 7 shows where a recent trail was cut through a denser portion of the Red Cedar Ecosite.

OMNR (2000) suggests that Red Cedar stands are more prevalent today because they are a pioneering species that will cover poor quality abandoned farmland. It may take longer for succession to occur here due to the shallow soils, although Elm and White Ash saplings and young trees were present. These stands are often considered to have low ecological value due to their lack of diversity, although they are sometimes considered to have value as Loggerhead Shrike habitat. Knowing that, we specifically surveyed for Shrikes during the field work and none were present. As well, most of the Cedar stands were too dense for Shrike habitat.

Figure 7. Trail cut through Red Cedar habitat.

Coniferous Forest (FOC). A woodlot that has more than 75% coniferous species. More detailed ELC delineation was not possible due to the diffuse nature of the coniferous woodlands. White Spruce, White Pine, and White Cedar were common with typical ages of about 60 years. Ground cover and shrub layers were mostly sparse or lacking as is typical in conifer woodlots (see Figure 8). Coniferous plantations can be seen here in 1978 aerial photography.

Figure 8. Conifer woodlot.

Cattail Mineral Shallow Marsh Type (MAS2-1). This small marsh abuts the existing quarry, and is bordered on the south by the gas pipeline. It is about 0.7 ha. in size, and technically would not be considered a wetland (2 ha. minimum) in the wetland evaluation manual. It is separated from the MAM 2-2 wetland described below by the Hydro easement, but the two wetlands are hydrologically connected. Together or separately they would be considered isolated marsh, meaning they have no outflow connection to another water body or wetland.

Reed Canary Grass Mineral Meadow Marsh Type (MAM2-2). This small marsh is located south of the gas pipeline, and may have been connected to the MAS2-1 marsh prior to the gas pipeline construction. It is about 0.4 ha. in size, and technically would not be considered a wetland (2 ha. minimum) in the wetland evaluation manual.

SIGNIFICANT FEATURES ASSESSMENT

Significant Wetlands

There are no significant wetlands within 120 m of the proposed expansion. There are two small connected wetlands found within the site and these are described in the Ecological Lands Classification Section of this report.

In Schedule 8-B of the OP the general area of these wetlands is highlighted as unevaluated wetland. These wetlands would not score as significant because they are too small, and do not contain the features and functions needed to prescribe wetland significance. Combined, they are also below the minimum size to be even considered for a wetland evaluation. We are also well qualified to address this lack of significance, having done over 100 wetland evaluations since 1985.

Regulation 148/06 of the CRCA does not allow development within wetlands that are greater than 0.5 ha (see CRCA 2012). If the two wetland areas are considered a single wetland their combined size is about 1.1 ha. If they are considered as separate then only one of the wetlands could be considered under Regulation 148/06. Either way, the CRCA may grant permission to develop within a wetland if:

"in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development."

In our opinion, the loss of these wetlands will not violate the intent of Regulation 148/06 but the proponent will need to apply to the CRCA for a permit to do so. Tom Beaubiah of the CRCA said the regulation would not apply if there is no surface connection from these wetlands to another, as is the case here. It should also be added that Regulation 148/06 would not apply if the license expansion is approved by MNR.

In Schedule 7-B of the OP the wetlands appear to be designated as riparian habitat. Riparian habitat is the zone between true upland and a river or stream and often refers to the streambank. As well, in documentation associated with their waterways regulation CRCA refers to a riparian buffer as a *vegetated strip of land extending along a shoreline (or along both sides of a stream).* Since there is no stream here, these small wetlands cannot be considered riparian habitat.

In Schedule 3-B of the OP the wetlands appear to be designated as an Environmental Protection Area. We are assuming this is a mapping artifact resulting from remote sensing, similar to what happens with some of the woodlands shown in the OP to be actually shrublands. It may also be due to the riparian and wetland designations in Schedule 7-B and 8-B. Since these wetlands are not significant, not riparian habitat, nor significant wildlife habitat, and because the waterways regulation likely does not apply, we feel that the EPA designation is not appropriate.

In regards to significant wetlands, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Habitat of Endangered and Threatened Species

No endangered or threatened species were encountered on the property during the field work.

There is an NHIC record for a Northern Bobwhite (*Colinus virginianus*)(SARA Schedule 1 Engangered, SARO Endangered) in the several 1 km squares associated with the quarry expansion. The last record for this species in the area is from 1856, and they are currently not found in this region.

Butternut trees are not uncommon in the region on habitat similar to that found on the quarry expansion area. Although we encountered no Butternut trees during our field work it is conceivable that they could be on the adjacent lands. As such, they will be discussed as a Level II issue.

In regards to the habitat of known endangered and threatened species, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Significant Areas of Natural and Scientific Interest (ANSI).

There are no ANSI's listed by Lindsay (1983) within 120 m of the proposed quarry expansion area.

In regards to significant ANSI's, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston

Significant Woodlands (see Figure 9)

Woodland has been identified in Schedule 8A of the City of Kingston OP as significant, which is based on woodland mapping provided by the CRCA. The CRCA notes that their significance ranking is tentative, because woodland boundaries have been determined from remote viewing. As such, fieldwork is required to confirm significance. This is also noted in Section 6.1.6 of the City of Kingston OP, where it states that:

"boundaries of the natural heritage system features are approximate and more specific delineation of the boundaries and the significance of the area must be determined through an environmental impact assessment"

The bulk of the lands designated as significant woodland (see dark green in Figure 9) or contributory woodland (light green in Figure 9) by the city are actually Red Cedar thicket or deciduous shrublands, which from aerial imagery, might appear as woodland. Tom Beaubiah of the CRCA walked part of the site in 2012 with Rob Snetsinger of Ecological Services and noted the presence of the red cedar stands and cultural thickets.

From our field work only a small portion of the lands identified in Figure 9 were considered woodland (see FOD5-8, FOC, and FOC2-1 in Figure 3). To determine significance of these woodlands we have provided the standard woodland ranking criteria provided in OMNR (2010).

1. **Size**. The quarry exists in Madoc site district 6E-9, of which 69% is in natural cover, although it is possible that district tree cover could be below 60%. In such situations, the significant woodland size threshold (see OMNR 2010) for areas with 30 to 60% woodland cover is 50 ha. or greater. The woodlands mapped on site are well below 50 ha. in size.

Conclusion: not significant for size.

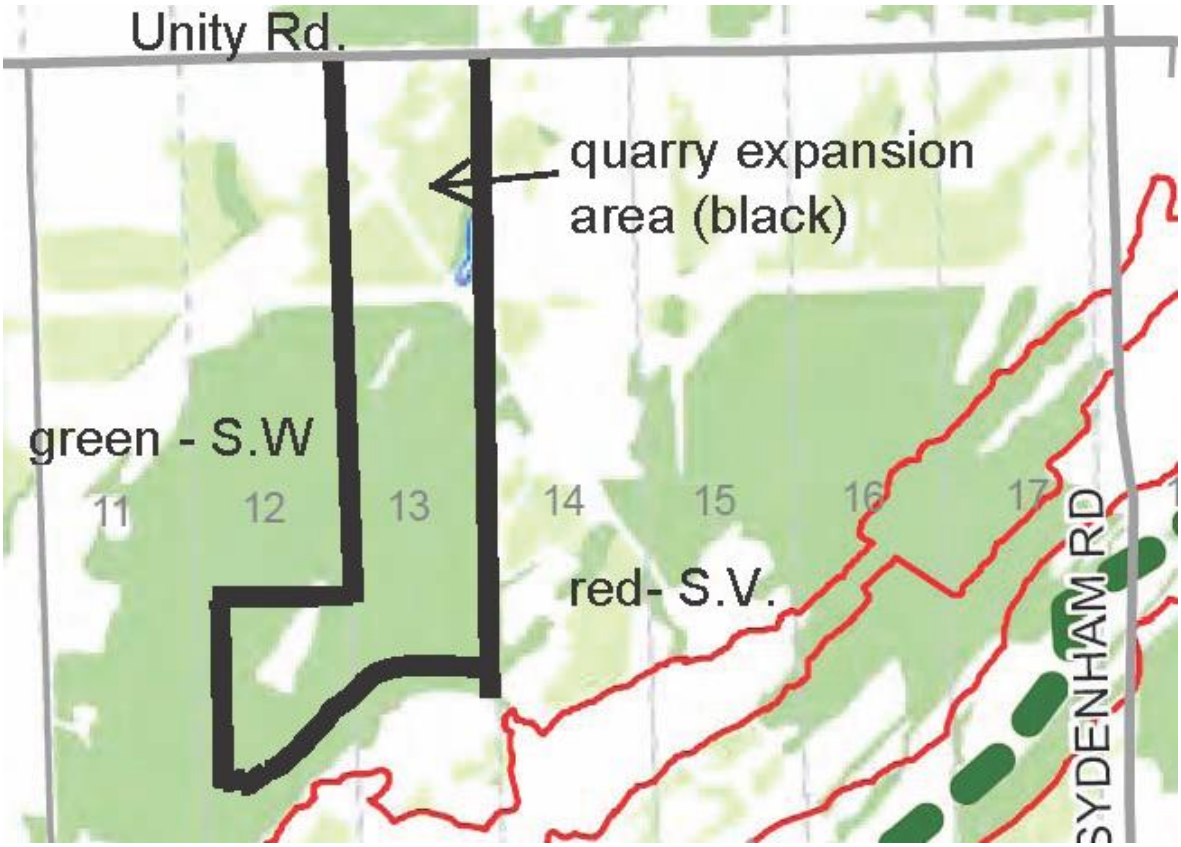

Figure 9. Delineation of significant woodland (dark green) within the approximate quarry expansion area, outlined in black.

2. **Woodland Interior**. The core habitat threshold is 8 hectares. Core interior habitat is undisturbed habitat within 100 meters of the woodland edge. The woodlands have no interior habitat.

Conclusion: not significant for interior habitat.

3. **Proximity**. Woodlands are considered significant if they are located within 30 m of an important natural feature such as fish habitat. There is a watercourse that is located more

than 120 m from the proposed expansion area, and more than 30 m from any woodland associated with the expansion area. It is not known if this watercourse contains fish habitat.

Conclusion: not significant for proximity.

4. **Linkages.** The woodland does not provide a link between two other significant features.

Conclusion: not significant for interior habitat.

5. **Uncommon characteristics** (e.g., rarities). No rarities were observed or are known.

Conclusion: not significant for uncommon characteristics.

6. **Water Protection**: Woodlands should be considered significant if they are located within a sensitive watershed or near the top of bank from a sensitive groundwater discharge, recharge, or headwater area. None of these are located in proximity to the expansion area woodlands. There is a stormwater drainage ditch within the woodland, which runs west to east alongside the K&P trail, but it is not considered sensitive for the purposes of woodland ranking.

Conclusion: not significant for water protection.

7. **Woodland Diversity**. Woodlands should be considered significant if they have uncommon forest assemblages or have a high diversity of features. The woodlands found in associated with the expansion area are of a common type in the region, lack diversity, and also contain many non-native species.

Conclusion: not significant for woodland diversity.

8. Uncommon Characteristics. Woodlands should be considered significant if they have a unique species, or species with a high Coefficient of Conservatism, or vegetation communities with S1, S2, S3 rankings, or a certain percentage of larger older trees. The quarry woodlands are mostly young, disturbed, and do not meet threshold criteria for uncommon characteristics.

Conclusion: not significant for interior habitat.

Conclusion: The woodlands associated with the expansion area are not significant, as based on OMNR (2010) criteria. However, the FOD5-8 slope woodlot (see Figure 5) located to the south of the expansion area has some value in the form of slope protection, older age, and fewer non-native species than other wooded areas associated with the quarry.

Although it is not been deemed significant we are still recommending that steps be taken to protect this FOD5-8 woodland and are therefore moving it to a Level II assessment.

Significant Valleylands

The City of Kingston Official Plan (Schedule 8A) shows potential significant valleyland (see red lines in Figure 9). It is intended that the proposed quarry expansion work will be 120 m from this red line.

In regards to significant valleylands, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Significant Wildlife Habitat

The *Significant Wildlife Habitat Technical Guide* (Ontario Ministry of Natural Resources 2000) outlines several categories that need to be addressed. These include habitat of seasonal concentrations of animals, rare vegetation communities, specialized habitats for wildlife, habitat of species of conservation concern, and animal movement corridors. All are discussed below.

Habitat of Seasonal Concentration of Animals

Habitats of seasonal concentrations of animals are areas where animals occur in relatively high densities for specific periods in their life cycles and/or in particular seasons. These areas are generally localized and relatively small in relation to the area of habitat used at other times of the year.

MNR (2012) lists 11 types of seasonal concentration habitats that were considered during the field work.

Waterfowl stopover and staging areas (terrestrial): Suitable stopover and staging habitat for migrating waterfowl include cultural meadow and thicket communities that are seasonally flooded. There are seasonally flooded cultural meadow or thicket communities within 120 m of the expansion area. There are two small ponds associated with the small wetlands on site. The larger pond is about 50 m^2 and the smaller is about 25 m^2. No waterfowl were observed using either, and their small size and proximity to disturbances means neither would be of any value for waterfowl stopover and staging.

Conclusion: In regards to waterfowl stopover and staging areas (terrestrial), this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Waterfowl stopover and staging areas (aquatic): These areas include ponds, marshes, lakes, bays, coastal inlets, and watercourses that are used during migration. There are two small areas containing wetland vegetation on site. The larger area has a pond that is about 50 m^2 and the smaller is about 20 m^2. To qualify as significant a site needs to have aggregations of 100 or more listed waterfowl species for 7 days, resulting in greater than 700 waterfowl use days. No waterfowl were observed using either, and their small size and proximity to disturbances means neither pond would be of any value for waterfowl stopover and staging.

Conclusion: In regards to waterfowl stopover and staging areas (aquatic) this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Shorebird migratory stopover area: Shorebird migratory stopover would have shoreline areas that are usually muddy and un-vegetated, but can also include beach bars and seasonally flooded shoreline. There is no such habitat on site.

Conclusion: In regards to shorebird migratory stopover, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Raptor wintering area: This habitat type includes a combination of fields (CUM, CUT) and woodlands (FOD, FOM, FOC) that provide roosting, foraging and resting habitat for wintering raptors. To be significant, this habitat must contain specific numbers of indicator species usage.

During the winter site visits in 2010, 2011, and 2014, no raptor winter usage of listed species was observed. Much of the site contains dense Red Cedar, which would not provide good feeding opportunities for overwintering raptors.

Other than areas on Amherst Island and Wolfe Island, the general area around Kingston is not known for significant raptor wintering concentrations.

Conclusion: in regards to raptor wintering area, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Bat hibernacula: These are found in crevice and cave ecosites (CCR and CCA). There is no cavern or crevice ELC ecosite present within 120 m of the proposed expansion area.

Conclusion: Bat hibernacula are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston..

Bat Maternity Colonies: These colonies are associated with mature FOD or FOM forested ecosites. The only potential habitat within the project lands are at the south end within the FOD5-8 woodland, which is too small, young, and lacking in snags.

Conclusion: Bat maternity colonies are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Bat Migratory Stopover Area: According to Amy Cameron of the MNR, criteria have not yet been developed for identifying bat movement corridors and therefore they do not need to be considered at this time. The only place in the province currently identified as SWH for bat movement corridors is Long Point (Ecoregion 7E) for silver-haired bats

Conclusion: Bat migratory stopover areas are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Turtle Wintering Areas: Wintering areas need water that is deep enough not to freeze to the bottom, and to have a soft mud substrate. The two small ponds within the proposed expansion area are too small and shallow to support overwintering turtles. As well, we observed no turtles within the property.

Conclusion: Turtle wintering area areas are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Reptile hibernaculum: OMNR (2012) notes that sites located below frost line in burrows, rock crevices, and other natural locations are needed. Broken and fissured rock can provide access to subterranean sites below the frost line. These areas should also have proper moisture levels to keep snakes from drying out during the winter, and south facing slopes are also preferable in providing more moderate winter conditions.

We observed no appropriate fissuring within the proposed expansion site except at the south end of the property in association with the FOD5-8 woodland. This woodland contains a south facing slope and some fissuring near the K&P trail. This FOD5-8 woodland will not be used as part of the expanded quarry. The south facing areas with fissuring for potential snake habitat will be about 100 m from the proposed expansion area.

Conclusion: Reptile hibernacula habitat is potentially present within 120 m of the proposed expansion area and in this regards will be discussed in the Level 2 assessment.

Colonially -Nesting Bird Breeding Habitat (Bank and Cliff): Nesting sites for these species includes eroding banks/cliffs, sandy hills, pits, steep slopes, rock faces or piles. These attributes do not exist within the expansion area.

Conclusion: Significant colonial-nesting bird breeding habitat (bank and cliff) is not considered to be present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Colonially -Nesting Bird Breeding Habitat (Trees/Shrubs): Nesting occurs in swamp and fen habitats, which are not present.

Conclusion: Significant colonial-nesting bird breeding habitat (trees/shrub) is not considered to be present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Colonially -Nesting Bird Breeding Habitat (Ground): Nesting occurs on rocky islands or peninsula within a lake or large river. These features are not present.

Conclusion: Significant colonial-nesting bird breeding habitat (ground) is not considered to be present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Butterfly migratory route/stopover areas: A butterfly stopover area needs to be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. The expansion area is further than 5 km from Lake Ontario

Conclusion: Butterfly migratory route/stopover habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Landbird migratory stopover areas: To qualify an area must include one of the following ELC codes (FOC, FOM, FOD, SWC, SWM, SWD) and be greater than 10 ha. Although some of these ELC comunities are present, none are greater than 10ha. Furthermore, the usage threshold was not met, of greater than 200 migrant birds/day and with 35 spp with at least 10 bird spp. recorded on at least 5 different survey dates.

Conclusion: Landbird migratory stopover area habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Deer yarding areas: For thermal winter cover, the predominate red cedar stands common to the expansion lands are not preferred by deer and minimal usage was recorded during winter track surveys. A review of available information on deer wintering areas confirmed there are no winter deer yards on or within 120 m of the expansion area.

Conclusion: Deer wintering areas are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Deer Winter Congregation areas: To qualify an area must include one of the following ELC codes (FOC, FOM, FOD, SWC, SWM, SWD) and should be greater than 100 ha. The expansion area does not meet this size criterion and during winter surveys, deer usage was found to be low.

Conclusion: Deer winter congregation areas are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Summary of Significant Habitats of Seasonal Concentration Areas: potential snake hibernaculum was identified within 120 m of the quarry expansion area and will be discussed in the Level 2 assessment. All other categories under significant seasonal concentration habitats are

not considered to be present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Rare vegetation communities

Vascular plant species encountered during the site investigation were used in characterizing vegetation community types. Plants identified as a species of conservation concern would be GPS referenced and the habitat would be surveyed in order to determine the extent of the population. If specimens could not be readily identified they would be collected and assessed later using appropriate references (e.g., Gleason and Cronquist 1991; Queen`s University Fowler Herbarium records).

Rare vegetation community types are those with SRANKS of S1 to S3 (i.e., extremely rare - rare - uncommon in Ontario). OMNR (2012) lists the following rare types for site region 6E: Cliffs and Talus Slopes, Sand Barren, Savannah, Tallgrass Prairie, Alvar, and Old Growth Forest.

OMNR (2012) also lists Other Rare Vegetation Communities, which are plant communities that contain rare species which depend on the habitat for survival. Henson and Brodribb (2005) identify the following provincially rare vegetation communities within the Madoc Ecodistrict 6E-9. These include:

Common Juniper - Fragrant Sumac - Hairy Beardtongue Alvar Shrubland	S2
Dry Bur Oak - Shagbark Hickory Tallgrass Woodland Type	S1
Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type	S3
Philadelphia Panic Grass - False Pennyroyal Alvar Pavement Type	S1
Red Cedar - Early Buttercup Treed Alvar Grassland Type	S2
Tufted Hairgrass - Canada Bluegrass - Philadelphia Panic Grass Alvar Grassland Type	S2S3
White Cedar - Jack Pine - Shrubby Cinquefoil Treed Alvar Pavement	S1
White Cedar - White Spruce - Philadelphia Panic Grass Treed AlvarGrassland Type	S3
Winterberry Organic Thicket Swamp Type	S3S4

None of the vegetation communities listed above was found during the site investigations within 120 m of the proposed expansion area.

Summary of Significant Rare Vegetation Community Habitat: Significant rare vegetation communities are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Specialized habitats for wildlife

The Ecoregion Criteria Schedules (MNR 2012) lists 5 categories of specialized habitat for wildlife for Site Region 6E. Each of these is discussed below in context with what was observed during the site investigations:

Waterfowl nesting area: This criterion includes wetland habitats adjacent to upland areas. There are two small areas containing wetland vegetation within the expansion area, but no waterfowl were observed to be using the ponds for nesting or feeding.

Conclusion: Waterfowl nesting area habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Bald Eagle and Osprey Nesting, Foraging and Perching Habitat: Sites with ELC designations FOD, FOM, SWD, SWM, and SWC that are adjacent to riparian areas are to be considered. There are no riparian areas associated with the expansion area and osprey and bald eagle were not observed during the site investigations.

Conclusion: Bald eagle, osprey nesting, foraging and perching habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Woodland Raptor Nesting Habitat: All ELC woodland types are considered possible, but they must be greater than 30 ha. in size and have more than 10 ha of interior habitat. There are no woodlands of this size on or within 120 m of the expansion area, nor any interior habitat, nor were any woodland raptors observed during the site investigations.

Conclusion: Woodland raptor nesting habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Turtle Nesting Areas: Turtle nesting areas include exposed sites typically with a southern exposure and with sand or gravel substrates that allow turtles to dig, and are within 100 m of certain wetland habitats. There are no appropriate wetland habitats that are within 120 m of the expansion area, which is predominately composed of dry thicket and field.

Conclusion: Turtle nesting area habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Seeps and Springs: No seeps or springs were identified within 120 m of the proposed expansion area.

Conclusion: Seeps and springs are not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Amphibian breeding habitat (woodland): Woodland of ELC classes FOC, FOM, FOD, SWC, SWM, and SWD containing wetland, or be next to a wetland can be potential amphibian breeding habitat. Although the two pockets of wetland vegetation are associated with FOC habitat, they are below the 2 ha. size limit for wetland ranking. The woodlands are dry, have shallow soils, and do not contain any ephemeral ponds. Threshold numbers for woodland amphibian use were not met.

Conclusion: Significant woodland amphibian breeding habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Amphibian breeding habitat (wetland): These areas would have ELC community classes SW, MA, FE, BO, OA and SA. There are two potential ELC communities that are applicable, a MAS2-1 and MAM2-2. To be significant the site must have a breeding population of 1or more of the listed salamander species or 3 or more of the listed frog or toad species and with at least 20 breeding individuals.

No salamander species were observed during the field work, nor would they be expected due to the dry nature of the habitat. During the amphibian call breeding surveys none of the listed species above were present in sufficient numbers to be considered significant.

Conclusion: Significant wetland amphibian breeding habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Summary of Specialized Habitats for Wildlife: Specialized habitats for wildlife were not found and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Habitat for Species of Conservation Concern

Categories of habitat that support species of conservation concern are listed in MNR (2012) for Site Region 6E. Each of these categories is discussed below in context observations made during the site investigations.

Marsh bird breeding habitat: All wetland habitats are to be considered as long as there is shallow water with emergent aquatic vegetation present.

Listed species include American Bittern, Virginia Rail, Sora, Common Moorhen, American Coot, Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon, Sandhill Crane, Green Heron, Trumpeter Swan, and special concern species include Black Tern and Yellow Rail. To be significant a site must have 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of

Sandhill Cranes; or breeding by any combination of 5 or more of the listed species above. Any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is significant.

None of these species were observed or heard calling during the surveys, nor would they be expected due to poor habitat quality.

Conclusion: Significant marsh breeding bird habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Woodland area –sensitive bird breeding habitat: All mature (>60 years old) natural forest (non-plantation) stands 30 ha or greater in size and with at least 10 ha interior habitat assuming 100 m buffer at edge of forest are to be considered for this criterion. There are no woodlands on or within 120 m of the proposed expansion area with these characteristics.

Conclusion: Woodland area-sensitive bird breeding habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Open country bird breeding habitat: Requires grassland habitat 30 ha or larger in size, that is not Class 1or 2 agricultural lands, and not being actively used for farming. There is no grassland habitat of this size within 120 m of the proposed expansion area. Adjacent lands include roadways, thickets, smaller grassy areas, woodlands, agricultural land, and a quarry.

Listed birds to be considered for open country bird breeding habitat include Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Northern Harrier, and Savannah Sparrow, and special concern species the Short-eared Owl. To be significant the presence of nesting or breeding of 2 or more of the listed species is required. During the spring breeding surveys none of the listed species were encountered.

Conclusion: Significant open country bird breeding habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Shrub/early successional bird breeding habitat: In order to be significant, shrubland or successional fields must be 10 ha or larger in size and this criteria is met. The indicator species include Brown Thrasher and Clay-coloured Sparrow, common species include Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher and special concern species include Yellow-breasted Chat and Golden-winged Warbler. To be significant a site must have the presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species, and breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat.

One of the indicator species was present (Brown Thrasher) and one common species (Field Sparrow) were present, which does not meet the threshold for significance.

Conclusion: Shrub/early successional bird breeding habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Terrestrial Crayfish: These only occur in SW Ontario.

Conclusion: Terrestrial crayfish habitat is not present and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Habitat of species of conservation concern

Species of conservation concern can be those that require specialized habitat, are sensitive to human intrusion, or have some level of rarity. They are usually associated with sites that are large, diverse, distinct, and undisturbed. The ecological character of the quarry expansion area property is abandoned farmland that is in the early to middle stages of succession to forest, and is mostly dominated by Eastern Red Cedar and it does not contain habitat of species of conservation concern. The six sub-categories of Species of Conservation Concern are presented below:

Special concern and Rare Wildlife Species: All special concern and provincially rare (S1 to S3) plant and animal species. The proposed quarry expansion occurs in the NHIC 1 km grids 18UQ70 0 46 to 48 and 56 to 58. There are no records for these grids. Furthermore no S1 to S3 species were encountered during the field surveys.

Conclusion: In regards to special concern and rare wildlife species, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Animal movement corridors

MNR (2012) for Site Region 6E, denotes amphibian movement corridors and deer movement corridors as areas as potential significant wildlife habitat.

Amphibian movement corridors: Amphibian movement corridors provide a link between wetland and woodland breeding habitat and summer and fall terrestrial habitat. There are no records of amphibian movement corridors for this site and no habitat or landscape features supportive of significant movements (e.g., riparian corridors) within 120 m of the proposed

quarry expansion. As well, the single small pond on site supports low numbers of breeding amphibians, with the next nearest amphibian habitat of any quality to be more than 500 m to the east, with the intervening land being the active quarry.

Conclusion: Amphibian movement corridors are not considered to be present within 120 m of the proposed expansion area and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Deer movement corridors: Deer movement corridors are associated with deer wintering habitat (MNR 2012). There are also no confirmed winter deer yards or deer movement corridors reported within 120 m of the proposed quarry expansion, and winter field work found no only sparse usage of the subject lands by deer.

Conclusion: Deer movement corridors are not considered to be present within 120 m of the proposed expansion area and in this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Summary of Animal Movement Corridors: The results of the site investigation determined that there are no animal movement corridors within 120 m of the proposed expansion area. In this regards, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of Loyalist Township.

Fish Habitat

There is no fish habitat within 120 m of the proposed quarry expansion.

In regards to significant wetlands, this aggregate application will be in compliance with the PPS, policies for the Aggregate Resources Act, and policies of the City of Kingston.

Conclusions & Recommendations

This report has followed the guidelines provided in the *Aggregate Resources Policy Manual* for a Level 1 Technical Report, which investigates whether or not significant natural heritage features are present.

Phase I Technical Reports; report on the presence of significant natural heritage features and are not intended as an assessment of impacts. If significant natural heritage features are found, then a Phase II report is initiated, requiring an assessment of impacts and recommendations.

Of the significant natural heritage features covered in the report, it was determined that none exists within 120 m of the proposed quarry expansion. There is a possibility that snake

hibernacula and endangered Butternut trees exist on the adjacent lands, and the woodland to the south of the expansion area has some forest value attributes. As such, we have moved all three features to a Level II discussion.

The quarry expansion area does contain migratory bird breeding habitat (albeit not significant). We recommend that land clearing take place either before or after the bird breeding season (late April to late July) in order to prevent destruction of nests and be in contravention of the *Migratory Birds Convention Act*. It is possible to work within the breeding season, as long as the land is cleared prior to late April.

Natural Environment Level II: Impact Assessment

Potential Significant Feature – Butternut trees on adjacent lands.

No Butternut trees were observed within the proposed quarry lands, but it is conceivable that they are within the woodlands off property to the west as this species is found in this habitat type in this region. These western lands are privately owned and were not accessed for this assessment.

Butternut Mitigation

If there is no woodlot intrusion into the adjacent lands to the west then any potential Butternuts should remain unharmed from quarry work. It is felt that a 15 m setback from the western boundary is adequate protection as long as a berm be built.

Value Feature Identified – Woodland

There is a Sugar Maple (FOD5-8) dominated woodland along the southern edge of the proposed expansion area (see Figure 10). It is about 2 ha. in size, and it ends abruptly at the top of slope along its northern edge where the adjacent habitat within the quarry property is dominated by woody shrubs such as Prickly Ash, Tartarian Honeysuckle, Gray Dogwood, and Red Cedar. Dog Strangling Vine is becoming more prevalent.

Woodland value primarily comes from erosion protection for lower elevations including the K&P trail, a small drainage ditch that occasionally carries water beside the trail, and possible snake hibernacula.

Woodland Mitigation: Since there are no plans to develop within this FOD5-8 slope woodland or to remove any trees, its value in slope protection should continue. As well, there will be a quarry wall built between the quarry and the woodland that will further insure woodland protection. However, it is conceivable that during wall construction, inadvertent intrusions by heavy equipment could have a negative impact. As such, the woodland edge should be clearly demarcated with some sort of marking system to prevent this.

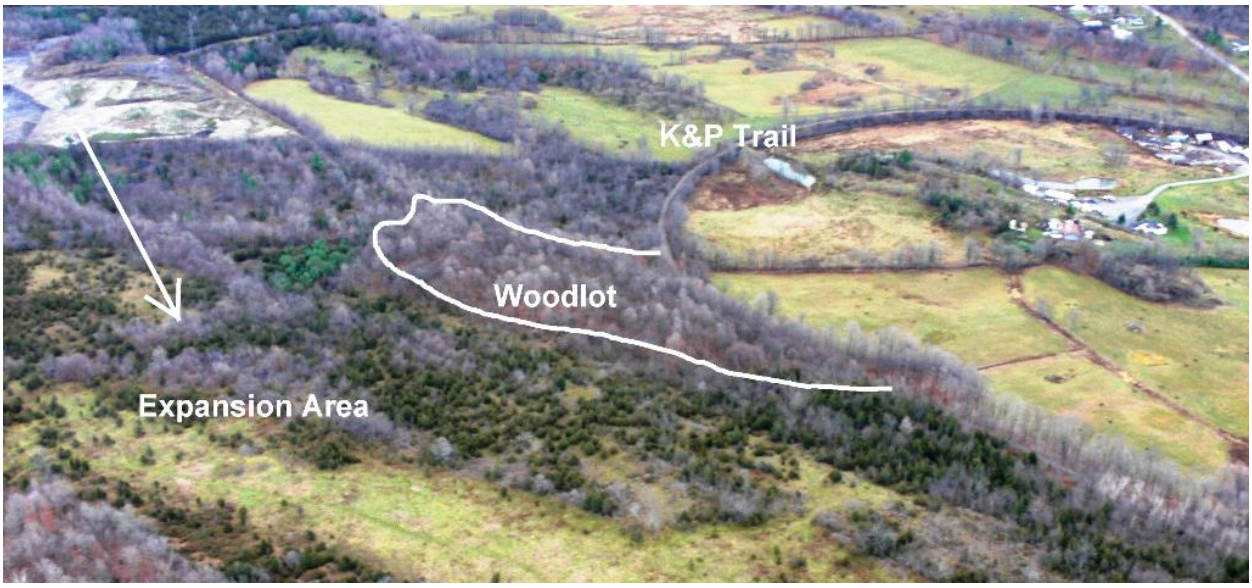

Figure 10. Significant Woodlot along southern edge of quarry expansion area.

Significant Feature Identified – Reptile Hibernacula

The FOD5-8 slope woodlot discussed above has some potential to contain snake hibernacula due to some fracturing, southward exposure, and field habitat further south. No hibernacula or snakes were discovered within the woodlot however.

The main focus of the EIS should be to insure no negative impacts to this potential hibernacula area. Since there are no plans to develop within the woodland or to remove any trees, then the hibernacula feature should continue.

Woodlot and Hibernacula Mitigation: Since there are no plans to develop within this FOD5-8 slope woodland or to remove any trees, its value in providing possible hibernacula should continue. As well, there will be a quarry wall built between the quarry and the woodland that will further insure woodland function. However, it is conceivable that during wall construction, inadvertent intrusions by heavy equipment could have a negative impact to the woodland, and indirectly impact possible snake hibernacula. As such, the woodland edge should be clearly demarcated with some sort of marking system to prevent this.

Literature Cited

CRCA (Cataraqui Region Conservation Authority). 2012. Guidelines for Implementing Ontario Regulation 148/06: Development, Interference with Wetlands andAlterations to Shorelines and Watercourses. Made pursuant to and consistent with Section 28 of the Conservation Authorities Act, R.S.O. 1990

Konze, Karl and McLaren, Margaret. 1997. Wildlife Monitoring Programs and Inventory Techniques for Ontario. Ontario Ministry of Natural Resources. Northeast Science and Technology. Technical Manual TM-009. 139 pp.

Lee, H.I., 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. Ontario Ministry of Natural Resources. Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG –02.

Lindsay, K. 1986. *Life Science Area of Natural and Scientific Interest in Site District 6 - 9*. Ontario Ministry of Natural Resources.

Ontario Ministry of Natural Resources OMNR. 2000. *A Silvicultural Guide for Managing Southern Ontario Forests, Version 1.1*. Queen's Printer for Ontario, Toronto, 648 pp.

OMNR (Ontario Ministry of Natural Resources). 2009. Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide. Ontario Ministry of Natural Resources.

OMNR (Ontario Ministry of Natural Resources). 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario. 248 pp.

Ontario Ministry of Natural Resources. 2011. Survey Methodology under the Endangered Species Act, 2007: *Dolichonyx oryzivorus* (Bobolink). Ministry of Natural Resources Policy Division Species at Risk Branch.

Ontario Ministry of Natural Resources. 2012. Survey Protocol for Eastern Whip-poor-will (*Caprimulgus vociferous*) in Ontario. Ontario Ministry of Natural Resources, Species at Risk Branch, Peterborough, Ontario. ii + 10 pp.

Ontario Ministry of Natural Resources. 2012. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. Draft.

Snetsinger. R. 2006. Species at Risk and Migratory Bird Assessment Cruickshank Construction Elginburg Quarry. Completed on behalf of Cruikshank Construction, Kingston Ontario.

Qualifications

I have a M.Sc. in Biology from Queen's University and have undertaken many ecological site assessments since 1985. In that time I have done over two hundred impact assessments, site evaluations, and baseline studies including several involving quarries. I have completed one of the regional ANSI reports and completed over one hundred wetland evaluations, and have taught both the wetland evaluation course and impact assessment courses at Queen's University. I am also a qualified Butternut Health Assessor and am certified to conduct Ecological Land Classifications.

Respectfully Submitted,

Rob Snetsinger

Appendix: Species Lists

Unity Quarry Plant List: Please note that this is not an exhaustive plant list as the EIS was focused on habitat characterizaton and significant features analysis.

Scientific Name	**Common Name**	**SRANK**
Acer negundo	Manitoba Maple	S5
Acer saccharum var. saccharum	Sugar Maple	S5
Achillea millefolium var. millefolium	Common Yarrow	SNA
Agrostis perennans	Perenial Bentgrass	S5
Alliaria petiolata	Garlic mustard	SNA
Amaranthus retrofrlexus	Red-root Amaranth	SNA
Ambrosia artemisifolia	Ragweed	SNA
Anemone canadensis	Canada Anemone	S5
Apocynum androsaemifolium	Spreading Dogbane	S5
Arctium minus ssp. minus	Common Burdock	SNA
Asclepias syriaca	Common Milkweed	S5
Barbarea vulgaris	Yellow Rocket	SNA
Bromus inermis	Awnless Brome	SNA
Campanula rapunuloides	Creeping Bellflower	SNA
Carex bebbii	Bebb's Sedge	S5
Carex pennsylvanica	Pennsylvania Sedge	S5
Carex vulpinoidea	Fox Sedge	S5
Carya cordiformis	Bitternut Hickory	S5
Carya ovata	Shag-bark Hickory	S5
Cerastium fontanum	Chickweed	SNA
Chenopodium album	Lambs Quarters	SNA
Chenopodium simplex	Maple Leaved Goosewort	SNA
Cichorium intybus	Chicory	SNA
Cirsium arvense	Thistle	SNA
Convallaria majalis	Lily of the Valley	SNA
Cornus racemosa	Grey Dogwood	S5
Cornus sericea	Red-osier Dogwood	S5
Cynanchum rossicum	European Swallow-wort	SNA
Daucus carota	Wild Carrot	SNA
Dianthus armeria	Deptford-pink	SNA
Dipsacus fullonum	Teasel	S5
Echinochloa crusgalli	Barnyard grass	SNA
Echium vulgare	Viper's-bugloss	SNA
Epipactis helleborine	Helleborine	SNA
Erigeron acris		S5
Erythronium americanum	Trout Lily	S5

Eurybia macrophylla	Large-leaf Wood-aster	S5
Euthamia graminifolia	Flat-top Fragrant-golden-rod	S5
Festuca rubra	Red Fescue	S5
Fragaria virginiana	Virginia Strawberry	S5
Fraxinus americana	White Ash	S5
Galium triflorum	Sweet-scent Bedstraw	S5
Geum laciniatum	Rough Avens	S4
Hemerocallis fulva	Orange Daylily	SNA
Hepatica americana	Hepatica	S5
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium praealtum	King Devil	SNA
Inula helenium	Elecampane	SNA
Juncus tenuis	Path Rush	S5
Juniperus communis	Ground Juniper	S5
Juniperus virginiana	Eastern Red Cedar	S5
Lactuca serriola	Prickly lettuce	SNA
Leonurus cardiaca	Motherwort	SNA
Leucanthemum vulgare	Oxeye Daisy	SNA
Linaria vulgaris	Toadflax	SNA
Lonicera tatarica	Tartarian Honeysuckle	SNA
Lycopus americanus	American Bugleweed	S5
Maianthemum racemosum	False Solomons Seal	S5
Malus pumila	Common Apple	SNA
Medicago lupulina	Black Medick	SNA
Medicago sativa	Alfalfa	SNA
Melilotus alba	Tall White Clover	SNA
Melilotus albus	White Sweet Clover	SNA
Melilotus altissimus	Tall Yellow Sweetclover	SNA
Minuartia michauxii	Michaux's Stitchwort	S5
Nepeta cataria	Catnip	SNA
Ostrya virginiana	Ironwood	S5
Parthenocissus quniquefolia	Virginia Creeper	S5
Pastinaca sativa	Wild Parsnip	SNA
Phalaris arundinacea	Reed Canary Grass	S5
Phleum pratense	Meadow Timothy	SNA
Picea glauca	White Spruce	S5
Pinus strobus	Eastern White Pine	S5
Pinus sylvestris	Scotch Pine	SNA
Plantago major	Plantain	SNA
Poa annua	Bentgrass	SNA
Poa compressa	Canada Bluegrass	SNA
Poa palustris	Fowl Bluegrass	S5

Poa pratensis ssp. pratensis		S5
Populus tremuloides	Trembling aspen	S5
Potentilla recta	Sulphur Cinquefoil	SNA
Prunella vulgaris ssp. lanceolata	Self-heal	S5
Prunus pennsylvanica	Pin Cherry	S5
Prunus serotina	Wild Black Cherry	S5
Prunus virginiana	Choke Cherry	S5
Quercus alba	White Oak	S5
Quercus rubra	Northern Red Oak	S5
Ranunculus acris	Tall Butter-cup	SNA
Rhamnus cathartica	Buckthorn	SNA
Rhus radicans	Poison Ivy	S5
Rhus typhina	Staghorn Sumac	S5
Rosa blanda	Smooth Rose	S5
Rubus idaeus ssp. strigosus		S5
Rubus occidentalis	Black Raspberry	S5
Rubus odoratus	P Flowering Raspberry	S5
Sambucus racemosa	European Red Elder	S5
Scrophularia lanceolata	Hare Figwort	S4
Setaria pumila	Foxtail	SNA
Silene cucubalus	Bladder Campion	SNA
Solidago caesia	Bluestem Goldenrod	S5
Solidago canadensis var. canadensis		S5
Solidago juncea	Early Goldenrod	S5
Solidago ptarmicoides	Upland WhiteAster	S5
Sonchus arvensis	Sow thistle	SNA
Stellaria pallida	Common Chickweed	SNA
Symphyotrichum cordifolium	Heart-leaf Aster	S5
Symphyotrichum lanceolatum ssp. lanceolatum	Panicled Aster	S5
Symphyotrichum lateriflorum var. lateriflorum	Small White Aster	S5
Symphyotrichum novae-angliae	New England Aster	S5
Syringa vulgaris	Common Lilac	SNA
Taraxacum officinale	Brown-seed Dandelion	SNA
Thuja occidentalis	White Cedar	S5
Tilia americana	American Basswood	S5
Toxicodendron radicans ssp. negundo	Poison Ivy	S5
Tragopogon dubius	Meadow Goat's-beard	SNA
Trifolium campestre	Low Hop Clover	SNA
Trifolium hybridum	Alsike Clover	SNA
Trifolium pratense	Red Clover	SNA
Trifolium repens	White Clover	SNA

Trillium grandiflorum	Trillium	S5
Typha angustifolia	Cattail	S5
Ulmus americana	American Elm	S5
Verbascum thapsus	Common Mullein	SNA
Veronica americana	American Speedwell	S5
Vicia sativa	Vetch	SNA
Vincetoxicum rossicum	Dog Strangling Vine	SNA
Zanthoxylum americanum	Northern Prickley Ash	S5
Brassica nigra	Black mustard	SNA
Fallopia cilinodis	Bindweed	S5
Lilium bulbiferum	Orange Lily	SNA
Lotus corniculatus	Bird's-foot Trefoil	SNA
Malva neglecta	Common Mallow	SNA
Typha angustifolia	Narrow leaved cattail	SNA
Vitis riparia	Riverbank grape	S5

Unity Road Quarry Bird List			**Comment**
Ruffed Grouse	Bonasa	umbellus	FOD5-8
Great Blue Heron	Ardea	herodias	flyover
Killdeer	Charadrius	vociferus	gas pipeline
American Woodcock	Scolopax	minor	FOD5-8
Ring-billed Gull	Larus	delawarensis	flyover
Rock Pigeon	Columba	livia	flyover
Mourning Dove	Zenaida	macroura	throughout
Belted Kingfisher	Megaceryle	alcyon	flyover
Northern Flicker	Colaptes	auratus	CUM
Least Flycatcher	Empidonax	minimus	CUT
Great Crested Flycatcher	Myiarchus	crinitus	FOD5-8
Eastern Kingbird	Tyrannus	tyrannus	CUM
Blue Jay	Cyanocitta	cristata	throughout
American Crow	Corvus	brachyrhynchos	throughout
Common Raven	Corvus	corax	flyover
Eastern Meadowlark	Sturnella	magna	transient
Black-capped Chickadee	Poecile	atricapillus	FOC2-1
White-breasted Nuthatch	Sitta	carolinensis	FOC2-1
House Wren	Troglodytes	aedon	quarry
Wood Thrush	Hylocichla	mustelina	FOC2-1
American Robin	Turdus	migratorius	throughout
Brown Thrasher	Toxostoma	rufum	CUT
European Starling	Sturnus	vulgaris	throughout
Cedar Waxwing	Bombycilla	cedrorum	CUT
Yellow Warbler	Dendroica	petechia	CUT

Black-throated Green Warbler	Dendroica	virens	FOC2-1
Black-and-white Warbler	Mniotilta	varia	CUT
Ovenbird	Seiurus	aurocapilla	FOD5-8
Common Yellowthroat	Geothlypis	trichas	MAS2-1
Eastern Towhee	Pipilo	erythrophthalmus	CUT
Chipping Sparrow	Spizella	passerina	CUM
Field Sparrow	Spizella	pusilla	CUM
Song Sparrow	Melospiza	melodia	throughout
White-throated Sparrow	Zonotrichia	albicollis	FOC2-1
Rose-breasted Grosbeak	Pheucticus	ludovicianus	FOC2-1
Red-winged Blackbird	Agelaius	phoeniceus	CUM
Common Grackle	Quiscalus	quiscula	throughout
Brown-headed Cowbird	Molothrus	ater	throughout
American Goldfinch	Spinus	tristis	throughout