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Preliminary Biodiversity Assessment and Comments on the DEIS for the Rapp Road Residential/Western Avenue Mixed Use Redevelopment Projects, Town of Guilderland, Albany County, New York

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Report prepared for the Town of Guilderland Planning Board

at the request of Save the Pine Bush,

1667 Western Avenue, LLC, and Red-Kap Sales, Inc.

14-April-2020

At the request of Save the Pine Bush, 1667 Western Avenue, LLC, and Red-Kap Sales, Inc., Hudsonia conducted a preliminary biodiversity assessment and a review of the DEIS for the proposed development of three parcels separated by streets on the south and west of the Crossgates Mall in the Town of Guilderland, Albany County, New York. Hudsonia does not support or oppose land use proposals; rather, we conduct field work, review documents, maps, and literature, and provide observations, data, analyses, and recommendations, as appropriate, to provide a stronger scientific basis for environmental and land use decision-making.

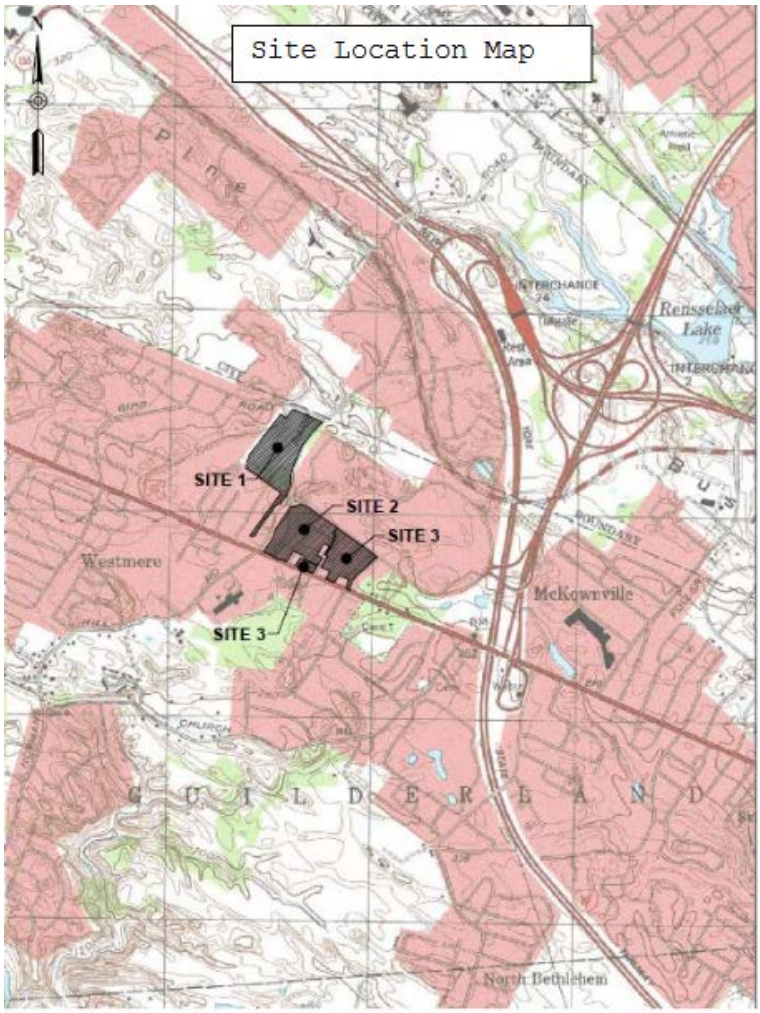

Figure 1. Locations of the three sites in the Town of Guilderland, Albany County, New York. (From DEIS:1.)

Three parcels are proposed for development, from west to east: Site 1, Site 2, and Site 3; Figure 1 shows the locations. Sites 2 and 3 are contiguous whereas Site 1 is separated from Site 2 by Rapp Road which is a two lane street with additional turning lanes creating a four-lane street between the southern dogleg of Site 1 and the west end of Site 2. Site 1 is proposed for construction of a large apartment complex, commercial space, and parking areas. Sites 2 and 3 are proposed for construction of a large retail center, office space, associated parking areas, and a gas station. I refer to the three sites collectively as the study area. Site 1 covers ca. 19 acres, Site 2 ca. 16 acres, Site 3 ca. 11 acres (DEIS 2020:2). Elevations in the study area are about 84-105 m (Google Earth).

I spent about 3.5 hours midday - early afternoon on 15 March and 5.5 hours midday – mid-afternoon on 6 April 2020 reconnoitering the study area to familiarize myself with the field situation and to be able to review the DEIS incisively. The weather was mild and sunny both days, calm on the first visit and with a light breeze on the second visit, with no snow on the ground or ice in ditches. I observed Site 1 from the edges, and walked extensively on Sites 2 and 3. I also reviewed relevant portions of the DEIS including the biological reports in Appendices F and G, and selected information about the Albany Pine Bush (e.g., Rittner 1976, Barnes 2003, Gifford et al. 2010, U.S.G.S. 2019a, b) and I consulted the scientific literature on a few of the key wildlife species addressed in the DEIS.

Geology and Soils

Bedrock underlying the study area is predominantly or all shale; there may be some sandstone in the west end (Fisher et al. 1961). Surficial geology was mapped as "dunes," non-calcareous sorted sand that is generally lakeshore-associated (i.e., associated with Lake Albany which existed during the period of glacier melting; Cadwell and Dineen [1987]).

Soils of the study area, which I observed on all three sites, are loamy fine sands and belong to the Colonie series, similar to the core Pine Bush a short distance to the north (Brown 1992). Study area soils, as mapped by Brown, are Stafford, Elnora, Colonie, Granby, and Udipsamments. Topography, as depicted on U.S.G.S. (1947), is or was dune-like, with the study area roughly similar in this respect to the core Pine Bush. The entire study area and its surroundings were mapped as part of the Pine Bush dune field by Donahue (1976). Although the Pine Bush soils in the Colonie series are generally moderately to strongly acidic, there are local occurrences of less acidic and even calcium-rich soils (Barnes 2003) that potentially support calcium-associated animals and plants. The dune in the northwestern corner of Site 2 was mentioned in Hartgen Archaeological Associates (2019).

Observations

At the time of my first visit, all three parcels were substantially covered by mature hardwood forest with an overstory dominated by native tree species (although clearing began on Site 2 on 26 March, see below). White pine was also prominent in some areas. There was an open, sparsely vegetated, non-forested area in the east-central portion of Site 1 next to Rapp Road and other non-wooded areas in the southwestern portion of Site 1 that I did not see, and there was another open, sparsely vegetated area in the south end of Site 2. These areas, as far as I could see, had weedy native and nonnative herbaceous plants including goldenrod (*Solidago*), mugwort (*Artemisia vulgaris*), common evening-primrose (*Oenothera biennis*), mullein (*Verbascum thapsus*), and grasses (Poaceae). One clump of knotweed (*Polygonum cuspidatum*) was present in the open area of Site 1 not far inside the vehicle entrance at Rapp Road, and a sparse but substantial patch of knotweed was present among the easternmost houses between sites 2 and 3. Other open, formerly managed, areas occurred around these houses.

Woody plants of Site 1, as seen from Rapp Road, included box-elder (*Acer negundo*), eastern cottonwood (*Populus deltoides*), red maple (*Acer rubrum*), black oak (*Quercus velutina*), tree-of-heaven (*Ailanthus altissima*), weeping willow (*Salix ×babylonica*), staghorn sumac (*Rhus typhina*), grape (*Vitis*), and Oriental bittersweet (*Celastrus orbiculatus*).

Woody plants of Site 2 included white pine (*Pinus strobus*), pitch pine (*Pinus rigida*), black walnut (*Juglans nigra*), black locust (*Robinia pseudoacacia*), tree-of-heaven, eastern cottonwood, Bell's honeysuckle (*Lonicera ×bella*, a hybrid swarm of Tartarian and Morrow honeysuckles), grape, and

Oriental bittersweet. The trees were generally pole-to-mature size with scattered large trees (up to 60+ cm [2 feet or greater] dbh), and fairly common seedling and sapling white pine. Standing dead and downed wood was uncommon, suggesting a modest age of the forest, with occasional large, dead eastern cottonwood and red maple. Tangles of woody vines were locally common. Pitch pine was rare and local (see below). Native trees (especially the fast-growing eastern cottonwood, red maple, and locally white pine) dominated the woodlands.

Woody plants of Site 3 were eastern cottonwood, red maple, box-elder, Norway maple (*Acer platanoides*), catalpa (*Catalpa*), white pine, pitch pine, black oak, white oak, ash (seedlings), black locust, black cherry (*Prunus serotina*), gray birch (*Betula populifolia*, one dead tree), common buckthorn (*Rhamnus cathartica*), tree-of-heaven, Bell's honeysuckle, American hazel (*Corylus americana*), mock-orange (*Philadelphus inodorus*), Japanese barberry (*Berberis thunbergii*), winged euonymus (*Euonymus alata*), multiflora rose, poison-ivy, grape, Virginia creeper (*Parthenocissus*), and Oriental bittersweet. I saw numerous honey locust (*Gleditsia triacanthos*) fruits on the forest floor but did not find the tree.

DEIS Appendix G asserted that there were only one or two planted pitch pines (*Pinus rigida*) on Sites 2 and 3 ("The Site lacks pitch pine (*Pinus rigida*)... Save for one or two individuals used as ornamental/landscape vegetation in the unoccupied residential lots."). However, I found seven live and one dead pitch pine. Two live pitch pines were about 12 meters apart in the east-central edge of Site 3 and each measured 39 cm dbh. One live pitch pine in the Site 3 dogleg north of Tiernan Court measured 47 cm dbh (possibly I missed one or more other pitch pines there). Four live pitch pines on the northwestern dune in Site 2 measured 23, 24, 33, 39 cm dbh, and one dead pitch pine 40 cm dbh, all in a cluster. One of this last group of pitch pines can be recognized by the coarse, platey bark in Hartgen Archaeological Associates (2019: Photo 13). Pitch pine is important because it confirms, along with the soils and dune, that Sites 2 and 3 were once part of the Albany Pine Bush and thus could support additional Pine Bush species.

While many herbaceous plants are undetectable or unidentifiable at the season of my visits, a few species were noteworthy. I saw several clumps of a woodfern, probably *Dryopteris carthusiana*, in the large central ditch and at the north end of Site 2. I also saw skunk-cabbage (*Symplocarpus foetidus*), multiflora rose (*Rosa multiflora*), and an unidentified sedge (*Carex*) in the ditch. A single paper birch (*Betula papyrifera*), ca. 22 cm (9 inches) dbh, stood at the big ditch. There was a small patch, perhaps two square meters, of common reed (*Phragmites australis*), not very vigorous-looking, in the north end of the ditch, presumably the nonnative subspecies *Phragmites australis australis*. The large central ditch, on both days, had discernible flow from south to north, steep (excavated) sides ca. 2-3 meters high, water up to 15-20 cm deep, and a firm silty-sandy bottom. Cobble-size rocks were present in old riprap at the mouths of culverts at each end of the ditch, within the site. The large south-north ditch, a channelized stream, was delineated as a wetland (Appendix G and Laing 2019c); the tributary ditch from Rapp Road to the western side of the south-north ditch may be part of this wetland but was not included in the delineation nor did the wetland report (see below) explain how the non-wetland status of the tributary was determined.

Any additional information about the wetland (the south-north ditch) on Site 2, and the mitigation proposed for culverting and filling it, are relevant to the biological impacts of the proposed development of Site 2. I was unable to find the wetland report (Laing 2019c) cited in Appendix G; Save the Pine Bush finally obtained it from the Town. Most of the site-specific information in the wetland report is copied from the other Laing reports. It contains nothing about mitigation although Appendix G stated that the wetland report discussed mitigation. The wetland report does not mention the common reed in the ditch. An interesting point is that Laing (2019c) identified a histosol, which is a highly organic wetland soil that would have taken centuries or millennia to form. I don't know the exact spot in the ditch where this soil

boring was done or whether it's representative of a larger area. There may be a buried histosol that remains from a formerly larger wetland, and it is possible that this wetland could be restored.

My assessment was not intended to be a wildlife species survey, and the middle of the day is not a good time to observe most wildlife. For the sake of completeness, I mention the following species (or their sign) observed casually: opossum (a skull on Site 2), unidentified mole burrow (Site 1), woodchuck, gray squirrel, raccoon, white-tailed deer, red-tailed hawk (overhead), pileated woodpecker, red-bellied woodpecker, common raven, common crow, white-breasted nuthatch, Carolina wren, tufted titmouse, northern mockingbird, blue jay, house sparrow, common grackle, dark-eyed junco, and northern cardinal. The raven was calling just southwest of Site 1. There were weathered pileated woodpecker feeding trenches in a dead red maple stem on Site 2. Pileated woodpecker was listed for Sites 2-3 in Appendix G (Laing 2019b).

The southern end of Site 3, just north of the Mobil station, had a substantial population of ostrich fern (*Matteuccia struthiopteris*) that extended more sparsely northward on the site. There were probably 50 or more clumps of this plant. Ostrich fern is readily identified by its fertile (spore-producing) leaves. Ostrich fern is not listed in the plant species list in Appendix G, surprisingly on account of its being conspicuous and easily identified. Appendix G also did not report woodfern, *Carex*, common reed, motherwort (*Leonurus cardiaca*), paper birch, American hazel, mock-orange, black raspberry (*Rubus occidentalis*), or knotweed, all of which I observed on Site 2 or Site 3.

Biodiversity Assessment

The soils of the study area are typical Pine Bush soils (Colonie series) according to Brown (1992), but the vegetation is a combination of hardwood forest and weedy species of disturbed areas (ruderals). As stated by Laing (2019a), the agricultural history of Site 1 (and probably portions of Sites 2 and 3 [my interpretation]), in addition to the surrounding urbanization, have probably contributed to the replacement of pine barrens vegetation by common woodland trees and ruderal herbs. Although the habitats of the study area are unsuitable for many rare Pine Bush animals and plants (but not all of them), these habitats nonetheless are capable of supporting other organisms of conservation concern (see Albany Pine Bush Commission 2019). The wood thrush could breed in the study area; wood thrush is a Species of Greatest Conservation Need (SGCN) in New York. Eastern red bat, silver-haired bat, and Indiana bat (in addition to northern long-eared bat, see below) roost in trees during the active season (Whitaker and Hamilton 1998) and could occur in the study area woodlands where there are dead and live trees with suitable bark voids. All three are SGCN and Indiana bat is listed as Endangered in New York. Laing (2019a) implied that the history of farming and soil alterations made Site 1 unsuitable for rare wildlife. Notwithstanding, New York City (Kiviat and Johnson 2013) and the New Jersey Meadowlands region (Kiviat and MacDonald 2004) support many rare animals and plants of conservation concern, despite massive alterations of soils, hydrology, and vegetation over hundreds of years making those regions far more disturbed than the present study area. I have also found uncommon and rare plants in abandoned soil mines in the Hudson Valley.

Evidently surveys were not specifically conducted for rare plants; no rare plant species is mentioned as a survey target in Appendix F or G. Yet B. Laing Associates found nodding trillium (Natural Heritage Program rank S3) and river birch (S3), both reported in Appendix G. Inasmuch as the plant species list in Table 1 is incomplete, plants of conservation significance that could occur very locally on Site1 could have been missed by the Laing field workers, and by me.

It is noteworthy that the study area sites are connected to, or close to, a network of woodlands in small and large patches within and adjoining the developed areas of Guilderland (see satellite imagery on

Google Earth). These woodland patches include preserves as well as privately-owned "vacant" lands, and are loosely connected to the numerous, mostly larger, preserves described by Schmitt and Brennan (1991). Although some animals and plants may not be able to disperse across four-lane roads such as Rapp Road between Sites 1 and 2, and Crossgates Mall Road, many birds and many flying insects, among other wildlife, can easily disperse across roads from one habitat patch to another. The presence of pileated woodpecker sign on Site 2 attests to this kind of connectivity, inasmuch as the pileated woodpecker typically has a home range much larger than any one of the three sites. The impact of removal of substantial areas of woodland habitat as a result of the proposed developments has not been adequately assessed in the DEIS, nor has the cumulative impact of these habitat changes in combination with the many other land use projects proposed or being undertaken in Guilderland and neighboring towns. In addition to the individual and collective habitat functions of the sites, urban woodlands provide important ecosystem services by storing carbon, absorbing stormwater, shading and evapotranspiration (which cool the local environment in summer), and providing healthful amenity value to human residents (e.g., Livesley et al. 2016).

The Colonie soils of the study area indicate that it was once part of the Pine Bush but has since been altered by farming, road building, ditching, and other activities. The sites have potential for the restoration of pine barrens vegetation although this would be difficult due to the probable increases in soil organic matter and nutrients, as well as an increase in pH, suggested by the current plant cover. The study area in its current condition as greenspace may be more valuable for ecosystem services (including habitats for biodiversity) than any tenuously-achievable and sustainable pine barrens restoration.

Worm snakes may well occupy the study area. Appendices F and G (Laing 2019a, b) asserted that the worm snake (*Carphophis amoenus*), a Special Concern species in New York, requires damp soils and would therefore not inhabit an area lacking Somewhat Poorly Drained or Poorly Drained soils and formerly affected by pig rooting (on Site 1). Worm snakes have been found across Rapp Road from Site 1, and in the electric transmission right-of-way near Site 1, as recently as 2009 (Conrad 2017, Gabriel 2019). The worm snake, however, has been reported from dry soils as well as moist soils (Willson and Doras 2004). Klemens (1993), writing about Connecticut, stated "Worm snakes were collected in well-drained soils, often in or near deciduous woodland." Klemens also noted that "...worm snakes appear able to persist in small patches of habitat in relatively urban areas." Cover objects, such as rotting logs and flat pieces of refuse, conserve moisture at the soil surface and possibly substitute for otherwise moist soils (this characteristic of microhabitats used by worm snakes was implied by Klemens [1990]). Worm snakes were found to use both natural and artificial cover objects in an unpublished Massachusetts study (Alan Richmond, presentation at 2019 Northeast Natural History Conference). The discovery of nodding trillium (*Trillium cernuum*), which is a FACW (facultative wetland) plant associated with moist to wet soils (Gleason and Cronquist 1991, Gargiullo 2007), at or in the big south-north ditch on Site 2 suggests there are at least pockets of moist soils that could be used by worm snakes in addition to the possibly predominant dry soils. Earthworms, generally considered the staple food for worm snakes (Gibbs et al. 2007), occur in the study area (Appendices F and G; E. Kiviat, personal observation). This information indicates that habitats on all three sites are potentially suitable for the worm snake. I have found no information suggesting that cut-and-fill or pig disturbance of soils decades ago would make Site 1 unsuitable for this species now. Only a single herpetofaunal species, northern gray treefrog (*Hyla versicolor*), was reported for Site 1 in Laing (2019a) and for Sites 2-3 in Laing (2019b); I would have expected at least red-backed salamander (*Plethodon cinereus*), garter snake (*Thamnophis sirtalis*), and brown snake (*Storeria dekayi*); these species are often urban-tolerant (Mitchell et al. 2008). Their absence from the lists suggests herpetofaunal survey techniques and effort might have been inadequate. The worm snake is a difficult species to detect due to its strongly fossorial (burrowing) behavior. The Pine Bush is a hotspot of herpetofaunal diversity (Stewart and Rossi 1981), although fragmentation and the historic changes in soils and vegetation would limit the occurrence of some species on the current study area. The

lack of complete search effort data and descriptions in Appendices F and G prevents judgment about the adequacy of survey coverage.

There is a well-known population of the eastern hog-nosed snake (*Heterodon platirhinos*; New York Special Concern) in the Pine Bush (Stewart and Rossi 1981). Appendices F and G dismissed the potential of the study area to support hog-nosed snakes because the sites lack "undisturbed, moist habitats" and do not provide suitable habitat for frogs and toads. Nonetheless, both Appendices reported the northern gray treefrog. And although the literature states that toads are the staple food of this snake, it is also reported to eat other frogs, invertebrates, and small mammals (Gibbs et al. 1981, Hulse et al. 2001, White and White 2002). I have no reason to think that past soil disturbance would limit the hog-nosed snake as it has been reported from soil mine pits in Connecticut (Klemens 1990) and I have found it in disturbed areas around occupied buildings in Maryland and in Dutchess County, New York. A sparse population of the hog-nosed snake would be difficult to detect and this has been my experience where I have lived in Dutchess County for most of my life. It is possible that hog-nosed snake and worm snake have persisted in the study area from the time when it was ecologically part of the Pine Bush.

Figure 1. Live trees and snags that were cut on 26 March 2020 on Site 2. Two of the trunks lack bark, therefore were standing snags prior to cutting. Photograph by Erik Kiviat 6 April 2020.

Also in Appendices F and G (Laing 2019a, b), it was asserted that, following NYSDEC guidance, northern long-eared bat (*Myotis septentrionalis*) would not use the study area in summer because it is more than five miles from the nearest known hibernaculum. Five miles is an insufficient DEC guideline. For example, White et al. (2017) found seasonal migration distances of northern long-eared bat up to 41 km (ca. 25 miles) in Nebraska. DEIS (52-53) stated that this species was not found on Site 1, but did not

say how bat surveys were performed (e.g., by means of bat call detector equipment; however the calls of the several *Myotis* bats in the region are difficult or impossible to distinguish in bat detector recordings). The DEC recommends (https://www.dec.ny.gov/animals/106090.html), regardless of location with respect to documented hibernacula or summer roosts, "Leave uncut ***all*** snag and cavity trees unless their removal is necessary for protection of human life and property." The DEIS did not refer to this recommendation although it is now posted on the Town Planning Department Web page at https://www.townofguilderland.org/planning-department/news/tree-cutting-begin-proposed-costco-site. It is important to note that retention of snags and cavity trees is very important for many birds, as well as arboreal mammals, and many invertebrates, fungi, lichens, mosses, and liverworts, as well as potentially the gray treefrog. At least a few snags were cut on 26 March on Site 2; two are shown in Figure 1.

I commend B. Laing Associates for surveying moths (Laing 2019a), a diverse and important but generally underappreciated group of wildlife. Two species included in the list in Appendix F, the bog deltote (*Deltote bellicula*) and the black duckweed moth (*Elophila tinealis = Synclita tinealis*), are wetland or pond species. Bog deltote is usually found in acidic bogs and fens; the larva of the black duckweed moth feeds on duckweed (*Lemna*, and possibly the related *Spirodela* and *Wolffia*, pond and wetland plants) (Forbes 1954, Beadle and Leckie 2012). The larva of the bog deltote feeds on the wetland plant, tussock sedge (*Carex stricta*) (Tim McCabe, personal communication). Appendix F stated "No wetlands or hydrologic features [presumably meaning surface waters] occur on-site or adjacent to the site." I can think of four possible explanations for this seeming contradiction: 1. There is indeed at least one wetland, vernal pool, or pond on or adjoining Site 1; 2. The two moths in questions were attracted to the collecting light or dispersed onto the site from wetland nearby; 3. These species can use non-wetland habitats; or 4. The two species were misidentified. Appendix F did not state who identified the moths on the list, or what the qualifications of the taxonomist were, nor did the text say if the identifications were documented with voucher specimens or photographs (these are all standard practices in reporting any organism that is not well-known). There appear to be ponds within ca. 620-760 m of Site 1. It is possible that duckweed occurs in the large ditch on Site 2 seasonally; I did not see any nor was duckweed (*Lemna*, *Spirodela*, or *Wolffia*) mentioned in either Appendix F or Appendix G. Interestingly, the only amphibian reported in Appendix F and G, gray treefrog, is a pond breeder, and the breeding habitat of this species was not reported. Although not typical, both bog deltote and black duckweed moth occasionally are found away from wetlands (Dylan Cipkowski, personal communication; Tim McCabe, personal communication). Because these two moths are usually found in or near wetlands or ponds, there may be an unreported small wetland or temporary pool on Site 1, perhaps hidden by dumped logs and slash, and this possibility needs to be addressed by the applicant.

Table 1 in Appendix F is a list of plants identified on Site 1. The list is short, contains a single grass and no sedge species, and is not a complete flora of the site. One plant on the list, white sagebrush (*Artemisia ludoviciana*), is a nonnative species that is probably rare in New York, and the New York Flora Atlas (Weldy et al. 2020) shows no specimen record for Albany County. Although this species has no conservation value, its occurrence in Guilderland may constitute an important locality record. Without photographic or specimen documentation, however, it is impossible to know if white sagebrush was correctly identified. There is also the potential that any nonnative plant can become weedy or invasive on a development site.

The southern house mosquito (*Culex qinquefasciatus*) listed in Appendix F, Table 2 is an extralimital species – its geographic range extends only as far north as Virginia although hybrids with the northern house mosquto (*Culex pipiens*) occur as far north as southern New Jersey (Savage and Miller 1995). Southern house mosquito in Guilderland is probably a misidentification. Southern house mosquito was also listed in Appendix G (Laing 2019b).

In Appendix G (Laing 2019b), hawthorn (*Crataegus* sp.), identified only to genus, is referred to as UPL (Upland). However, there is a number of hawthorn species with variable habitat affinities, and without knowing the species, the wetland indicator status can't be known. For example, *Crataegus crus-galli* is FAC (a facultative wetland species). (Wetland plant indicator rankings are explained in Lichvar et al. [2016]; FAC or facultative wetland species are found about equally in wetland and upland habitats, whereas 99% of UPL species occurrences are upland rather than wetland.)

Appendix G includes river birch (*Betula nigra*) in the plant list for Sites 2 and 3, but omits paper birch (*Betula papyrifera*). The Appendix does not mention that river birch in New York is classified as S3 Rare (Young 2019). Where is the river birch and was it planted? Or was paper birch misidentified as river birch?

Some Potential Impacts of Development

The sandy Colonie soils are very permeable and groundwater is easily polluted (Dineen 1976, 1979). A gas station on these soils is a risk for leaks and spills of gasoline and other motor vehicle fluids that could move through the permeable soils into the unconsolidated aquifer.

Dumps are widespread on all three sites (Hartgen Archaeological Associates 2018, 2019: Photo 8; E. Kiviat, personal observations). Text and photos in Hartgen Archaeological Associates (2018) indicate extensive surface and subsurface dumping associated with cut-and-fill soils. Part of the disturbed area adjoining Rapp Road on Site 1 was evidently used as a log dump and also contains a large soil pile; the area could contain other kinds of refuse. On Sites 2 and 3 I saw tires, other vehicle parts, electronics, household garbage, demolition debris, cinder blocks, bottles, cans, household garbage, a backpacking tent, lumber, a fragment of chain-link fence, and other refuse at scattered locations. Hazardous materials such as pesticides or asbestos could have been disposed of in the study area; this is common on undeveloped lands in urban areas. Dumping was extensive in the Pine Bush prior to creation of the Albany Pine Bush Preserve. I have been unable to find a site assessment for hazardous wastes in the DEIS, although this is typically done in such situations. Dumps and soil piles need to be mapped throughout the study area and analyzed for hazardous wastes before any further development planning.

The warm local climate of the Pine Bush (Barnes 2003), together with vegetation and soil disturbance associated with site preparation and construction, would make the sites highly invasible by weeds such as knotweed, tree-of-heaven, multiflora rose, and other species that are already present. The EIS should address non-chemical management of such weeds prior to and following construction, to avoid creating a nuisance for landscaping and a possible hazard to building footings. Knotweed, in particular, has been considered hazardous to structures, although this hazard may be exaggerated; nonetheless, knotweed can damage pavement, walls, and foundations by growing into preexisting cracks (Fennell et al. 2018).

Light pollution from artificial night lighting has had strong negative impacts on the Pine Bush moth fauna, according to moth researcher Tim McCabe (personal communication). Night lighting associated with the proposed buildings and infrastructure may exacerbate this effect. (See, e.g., van Langevelde et al. [2017] regarding light pollution effects on moths.)

It is proposed to replace the open south-north ditch on Site 2 with a culvert (Maser Consulting 2019). This seems unfortunate inasmuch as restorationists are working to "daylight" previously culverted streams in the U.S. and many other countries (e.g., Neale and Moffett 2016). As mentioned above, there may be a buried wetland soil that could be uncovered and restored to wetland ecology.

Additional Comments on the DEIS

The Vegetation, Wildlife, and Soil Conditions Reports (Laing 2019a, b) briefly mentioned the wildlife survey methods used but did not describe the amount of effort (e.g., person-days for a particular technique), the dates of particular surveys, the references used for identification, or the names and qualifications of the surveyors. These would have a major effect on survey findings, potentially resulting in misidentifications as well as species that are present but overlooked. Appendices F and G did not even list their authors. These are serious omissions that compromise the credibility of the Appendices and the DEIS that cited them. The reports also did not show any actual soils data (just a single photograph) to support the statement that soils had been extensively modified by farming and that the Poorly Drained (PD) and Somewhat Poorly Drained (SPD) soils no longer existed onsite because of filling. Given that PD soils are usually hydric (wetland) soils, and SPD soils are sometimes hydric, as well as the reports onsite of animals that are usually associated with wetlands, rigorous documentation of soils is needed.

Ca. 10 acres of vegetation were proposed to be removed from Site 1 and replaced with structures and landscaping. Topsoil was also proposed to be stockpiled and reapplied (DEIS). This represents a substantial loss of carbon storage in plant material (including wood) and soil organic matter – even if topsoil is stockpiled and reapplied carbon loss will occur. Conveying 8.4 acres of land (at another location) to be preserved by the Pine Bush Commission is not really a greenhouse gas offset as claimed (DEIS:127 etc.) – there will still be net emissions of GHGs from organic matter that will decompose faster than if left onsite in existing live and dead vegetation and soil. I do not find meaningful consideration of GHG emissions and climate change implications in the DEIS as is strongly encouraged under SEQRA (Ahrens et al. 2009). DEIS (33) stated “Additional grading and clearing activities will also be required and will include removal of the trees, shrubs, stumps and topsoil in the western portion of Site 2.” – not only does this represent additional GHG emissions, but also seems to include the many native trees among which are the pitch pines on the dune in the northwest of the site (Laing [2019b] did not mention the northwestern pitch pines, or the pitch pines in the eastern edge of Site 3, only those among the unoccupied houses). The DEIS apparently did not state whether the logs, stumps, and slash from forest clearing would be carted to a dump or used to build brushpiles for wildlife onsite. (See below regarding vegetation cutting that occurred between my two visits to the study area.)

DEIS (100) stated that plantings would emphasize native species but did not say if the “native” species would be species of the Albany Pine Bush region and propagated from locally sourced material. There is a planting list that includes mostly nonnative species, some of which could become invasive. Plantings should be limited to species native to the region (e.g., Albany County) from locally-sourced stock, and perhaps a few species such as forsythia that have been planted in the Hudson Valley for many years without displaying invasive tendencies.

Appendix F (Laing 2019a) contained a January 2017 letter reporting file data on rare species from the New York Natural Heritage Program. NYNHP recommends that requests for data be updated annually prior to actual construction.

Clearing of Site 2

On 26 March 2020, vegetation cutting commenced on a large area of Site 2, with virtually no alert to the community and before regulatory approval of the development applications. Many trees were cut. I examined photographs and video recordings made by Save the Pine Bush and examined the area on 6 April. Vegetation cutting represents an unnecessary loss of habitat values and other ecosystem services (see above). The heavy equipment used caused severe rutting to the sandy soils (Figure 2); vegetation

removal and soil disturbance will make the site more invasible by nonnative weeds. The pitch pines in the northwest corner of the site and the paper birch at the ditch were not cut; I don't know if the nodding trillium reported in DEIS Appendix G was destroyed. The soil disturbance and vegetation debris from cutting could mask the dumps on Site 2 (see above). Inasmuch as it has not yet been determined under SEQRA how Site 2 will be used, the clearing is premature and may foreclose certain potential land uses.

Figure 2. Soil damage from tracked logging equipment operated 26 March 2020 on Site 2. Photo by Erik Kiviat 6 April 2020.

A "Tree-clearing Report" (Laing 2020) implied justification for cutting vegetation because it was second growth forest and because some invasive plants were common. Almost all forest in New York State is second growth (as opposed to forest that has never been cleared or logged during the historic period).

Moreover, urban forests usually have a mixture of nonnative and native plants, some of which are invasive species. These characteristics do not contradict the importance of urban forests, including Site 2, for biodiversity and other ecosystem services. The vegetation cutting and soil disturbance on Site 2 will make the site more invasible, and repeated management treatments may be needed to control the very weeds that Laing (2020) implied were justification for clearing the forest.

I counted more than 80 annual growth rings in one white pine stump near the north end of Lawton Terrace that was cut 26 March. Save the Pine Bush (personal communication) counted 53, 56, 67, and 72 rings on four other freshly-cut stumps of various species on Site 2. There are many large trees on sites 2 and 3; I measured trees of several species in the 60 to 99 cm (about 24 to 39 inches) dbh range. These ring counts, and the sizes of the larger trees, clearly indicate the inaccuracy of the description of the trees onsite as "young" and "transitional" (Appendix G).

On 27 March 2020, the town issued a stop work order for the vegetation cutting. Irrespective of the eventual regulatory decisions regarding the proposed developments, it seems appropriate for the applicant to be required to fund an environmental benefit project as compensation for the unapproved vegetation clearing.

Conclusions

It is apparent from examining DEIS Appendices F and G that at least some of the biodiversity issues have been dismissed without adequate attention to either the literature or the field situation, including the Threatened northern long-eared bat and the Special Concern worm snake and hog-nosed snake. There are oddities in the species lists, some of which are likely due to misidentifications, and the lists are very incomplete. Personnel who conducted the surveys and identified the species listed are not named nor are their qualifications stated, and there is no indication whether voucher photographs or specimens were made of the unusual organisms identified as white sagebrush, moths, or southern house mosquito. Descriptions of survey methodology are scant, and the person-hours or person-days of survey effort for various groups of organisms are not stated. There are no soils data presented to support the assertions regarding cut-and-fill and pig rooting having occurred on Site 1, although it is clear that all three sites have been substantially disturbed historically. There is no mention of the numerous dumps containing a wide variety of materials, and the potential for the existence of hazardous materials beneath soil mounds and other cover.

Sites 1, 2 and 3 are part of an extensive network of preserved and non-preserved greenspaces in the Town of Guilderland and neighboring urban and urbanizing areas. These greenspaces have great importance for biodiversity, water resources, carbon storage, microclimate, and amenity. Clearing and development of these sites would cause further fragmentation and degradation of habitat for many common and uncommon wildlife and plant species. Operation of the proposed gas station (Site 2) would pose a high risk of groundwater contamination from spills and leaks in the highly permeable Colonie soils. The cutting of vegetation on a large portion of Site 2 on 26 March 2020 is causing a massive loss of ecosystem services, including woodland habitat, carbon storage, microclimate amelioration, and stormwater absorption. Many of the existing and potential impacts of proposed development in the study area will be cumulative with other land use change proposed or underway in Guilderland. Before the town permits any further development, the cumulative impacts of all new development on water resources, biodiversity, and other ecosystem services should be analyzed.

The data requests to the New York Natural Heritage Program should be updated as there may be newer records of rare wildlife or plants than those reported in the 2017 correspondence. NYNHP recommends repeating requests annually.

All three sites should be examined by an independent, experienced wetland delineator for any small wetlands or vernal pools that may have been overlooked. New surveys for all species of bats, worm snake, hog-nosed snake, wood thrush, prairie warbler, other wildlife Species of Greatest Conservation Need, and rare plants (S1, S2, and S3-ranked species) should be conducted by independent, experienced field biologists at the appropriate seasons and with appropriate techniques and adequate survey effort. The cutting of vegetation on Site 2 has changed the habitat which will soon support species that were not using the study area when the Laing surveys were performed. This increases the need for new surveys.

There are incorrect implications in the Laing reports that, because the sites are covered by second growth forests, and because nonnative weeds are common, it is environmentally acceptable to clear vegetation. Inasmuch as the sites are part of a network of preserved and private greenspaces in a town with a lot of development activity, biodiversity assessments and biological surveys of better quality are necessary to allow the regulatory agencies and citizenry to have scientifically accurate, properly documented, up-to-date, and site-specific biodiversity information for land planning, conservation, and management purposes. At present, this information does not exist.

It would be expensive, laborious, and maintenance-intensive to restore the study area to Pine Bush vegetation. However, the three sites in their current condition, especially with the numerous large trees remaining on Sites 1 and 3, and portions of Site 2, provide many important habitat functions for biodiversity and non-habitat ecosystem services in an urban environment. This is the yardstick against which development should be assessed, not restoration to a historic state. The use of Sites 1, 2, and 3 should also be considered within the cumulative impact framework of the entire Town of Guilderland.

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