From: Steve Evans, Susan Hall, Sandy Levin, ECAC

Re: 952 Southdale Road

Proposed Commercial Development, EIS Review

An ECAC working group has reviewed the above-noted development proposal and recognize that this proposal has been changed in an effort to avoid appeals to LPAT. Previous appeals were supported by the Tribunal with respect, specifically, to a reduced buffer on the west side of the existing Buttonbush wetland which a designated PSW. The applicant has now submitted a revised application that maximizes the buffer as much as possible even though the required 30 metre buffer will not be maintained. As a means of mitigating the potential impacts of a reduced buffer the applicant is proposing wetland compensation along with substantial engineering techniques to ensure no negative impacts to the PSW.

Such techniques would include LID's to help control surface water flows on the site and water taking and discharge plans that would support construction dewatering. It is understood that the City will review such plans and require that any groundwater and surface water that is pumped as a result of construction dewatering will avoid harm to the PSW. This is very important as the Buttonbush PSW could be impaired by a reduction in water flowing into this feature (as noted below). ECAC is supportive of City's oversight of the water taking and discharge plans to ensure proper water balance and the protection of the PSW.

The applicant is proposing to construct a retaining wall along the west boundary of the reduced buffer to the Buttonbush PSW to control any surface flooding that may impact the developed portion of the site. While it is acknowledged that such retaining wall is necessary to protect the proposed development, the construction of such wall could have a negative impact on the buffer. This is because it will be difficult to excavate for such structure along the buffer boundary without any construction activity occurring within the buffer. This situation is of concern to ECAC especially since the buffer is less than 30 metre from the PSW as required by the London Plan. As a result, ECAC would recommend that the City oversee the design and construction of the retaining wall to ensure that any impacts to the buffer are adequately mitigated.

The Michigan Natural Features Inventory website includes a natural community description of inundated shrub swamp and a more detailed abstract on inundated shrub swamp. We have provided the links for both below to provide more detail than the EIS.

https://mnfi.anr.msu.edu/abstracts/ecology/Inundated_Shrub_Swamp.pdf

Abstract Citation:

Slaughter, B.S., M.A. Kost, and J.G. Cohen. 2010. Natural community abstract for inundated shrub swamp. Michigan Natural Features Inventory, Lansing, MI. 14 pp.

Buttonbush is tolerant of a variety of hydrologic disturbances, including short- and long-term flooding, deposition of salts in low concentrations, and effluent accumulation (McCarron et al. 1998, Hubbard et al. 1999, Simmons et al. 2007), but impacts of hydrologic disturbance on the inundated shrub swamp community as a whole are less well understood. Lowering of the local water table is likely to increase periods of seasonal drying in occurrences strongly influenced by groundwater inputs and result in tree establishment and conversion to southern hardwood swamp. Alteration or conversion of adjacent forest may result in increased or decreased surface water runoff. Decreased surface water runoff to inundated shrub swamps that are primarily fed by precipitation may result in longer periods of drying and the establishment of a forest overstory and subsequent conversion to southern hardwood swamp. Increased runoff from adjacent agricultural fields, roads, and developments may lead to excessive inputs of nutrients, sediments, and chemicals, which may lead to the establishment and eventual dominance of invasive plants such as narrow-leaved cat-tail (*Typha angustifolia*), common reed (*Phragmites australis*), and purple loosestrife (*Lythrum salicaria*). In addition, changes in hydrology that raise water levels for prolonged periods can result in mortality of species intolerant of long-term flooding, thereby reducing overall floristic diversity.

Simmons, M.E., X.B. Wu, and S.G. Whisenant. 2007. Bottomland hardwood forest species responses to flooding regimes along an urbanization gradient. Ecological Engineering 29: 223-231.

While major flood events kill invading trees, contributing to the persistence of inundated shrub swamp, extended periods of drought or hydrologic changes that lower the water table foster tree establishment and conversion to swamp forest. Anderson, D.M. 1982. Plant communities of Ohio: A preliminary classification and description. Division of Natural Areas and Preserves, Ohio Department of Natural Resources, Columbus, OH.

Buttonbush is also tolerant of nutrient inputs and water pollution, including low concentrations of salt (McCarron et al. 1998, Hubbard et al. 1999).

Although buttonbush has broad ecological amplitude, it is particularly characteristic of inundated shrub swamp due to the hydrologic dynamics that shape this natural community. Inundated shrub swamp is characterized by an impermeable clay layer that results in seasonal

to permanent inundation. Maintenance of buttonbush populations appears to require a minimum water depth of 0.5 m (19 in) (Faber-Langendoen and Maycock 1989).

Hubbard, R.K., J.M. Ruter, G.L. Newton, and J.G. Davis. 1999. Nutrient uptake and growth response of six wetland/riparian plant species receiving swine lagoon effluent. Transactions of the ASAE 42: 1331- 1341.

McCarron, J.K., K.W. McLeod, and W.H. Conner. 1998. Flood and salinity stress of wetland woody species, buttonbush (*Cephalanthus occidentalis*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*). Wetlands 18: 165-175.

Faber-Langendoen, D., and P.F. Maycock. 1989. Community patterns and environmental gradients of buttonbush, *Cephalanthus occidentalis*, ponds in lowland forests of southern Ontario. The Canadian Field-Naturalist 103: 479-485.

Long-term drought may result in tree colonization and the conversion of inundated shrub swamp to closed-canopy southern hardwood swamp (Anderson 1982, Kost et al.2007

Kost, M.A., D.A. Albert, J.G. Cohen, B.S. Slaughter, R.K. Schillo, C.R. Weber, and K.A. Chapman. 2007. Natural Communities of Michigan: Classification and Description. Michigan Natural Features Inventory, Report No. 2007-21, Lansing, MI. 314 pp.

Inundated shrub swamp hydrology should be maintained by establishing a relatively wide upland buffer zone to prevent surface water run-off from inappropriate sources and protect groundwater seepage zones. Hydrologic disturbances, including increased or decreased flood cycles, sediment and/or nutrient loading, and changes to water chemistry, may alter vegetative composition and structure of wetland communities.

Invasive vascular plant species documented in inundated shrub swamps include garlic mustard (*Alliaria petiolata*), Canada thistle (*Cirsium arvense*), autumn olive (*Elaeagnus umbellata*), moneywort (*Lysimachia nummularia*), reed canary grass (*Phalaris arundinacea*), glossy buckthorn (*Rhamnus frangula*), multiflora rose (*Rosa multiflora*), curly dock (*Rumex crispus*), horse nettle (*Solanum caroliniense*), and bittersweet nightshade (*S. dulcamara*) (Kost et al. 2006, Kost et al. 2007). Additional invasive plants capable of invading inundated shrub swamp in Michigan include narrow-leaved cat-tail, common reed, purple loosestrife, and hybrid cat-tail (*T.* x*glauca*). Efforts to detect, monitor, and control invasive species should be implemented to prevent these plants from outcompeting native species and altering community structure and function.

https://mnfi.anr.msu.edu/communities/description/10680/inundated-shrub-swamp