



WEST VIRGINIA
BROWN FIELDS

Krodel Park Expansion-Conceptual Plan Proposal



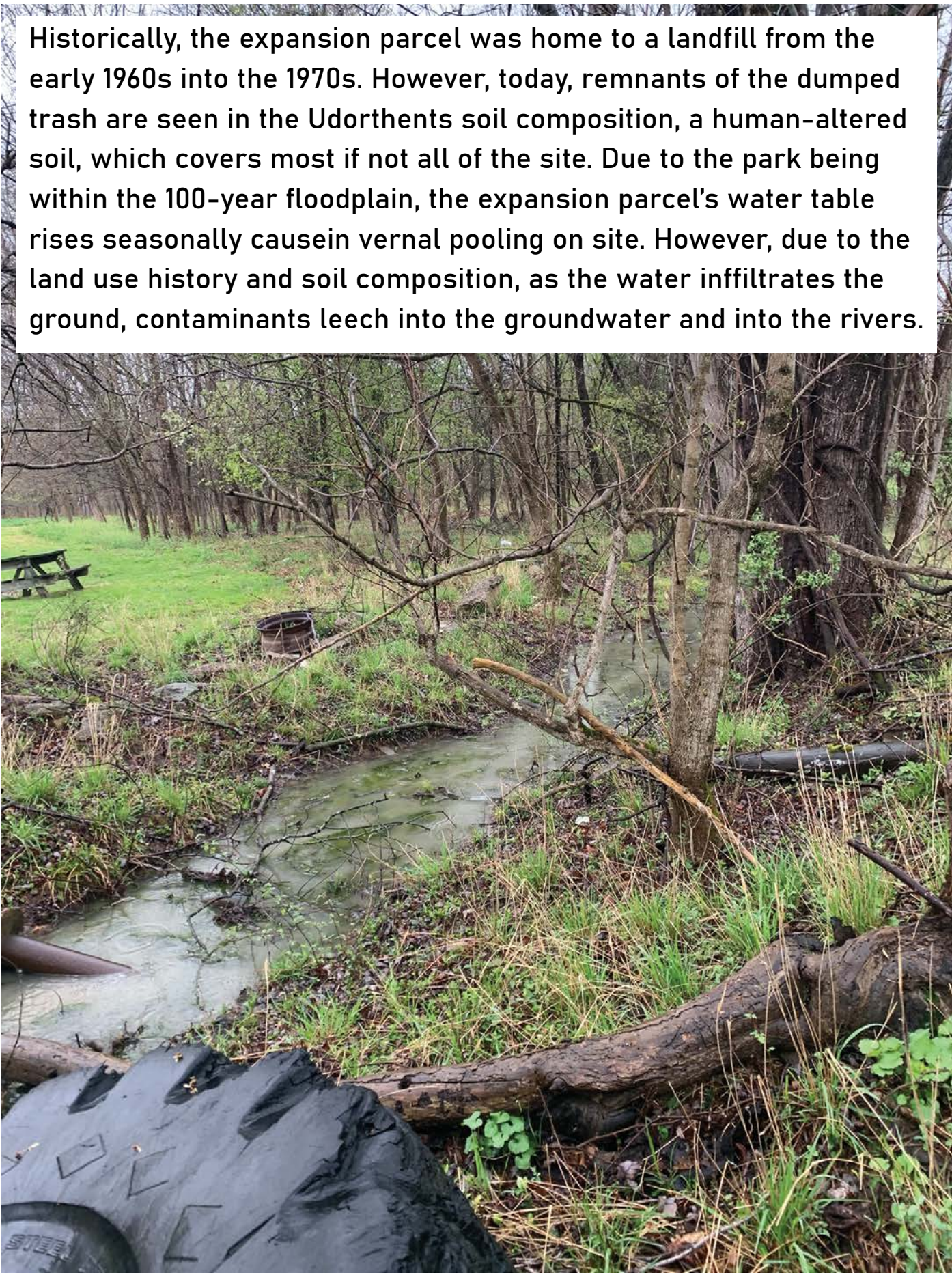
Table of Contents:

Intro and Project Brief	3
Krodel Park Context Map	4
Krodel Park Site Inventory	5-7
Krodel Park Site Pictures	8-10
Krodel Park Site Plan	11
Krodel Park Soil Capping and Planting Scheme	12
Species Spotlight: <i>Arundinaria gigantea</i>	13
Rivercane Sanctuary Garden Render	14
Activity Space Elements and Layout Diagram	15
Resources and Recommended Action Steps	16

Designed and created by:
Fisher Hemwall, GRA, MSANRD



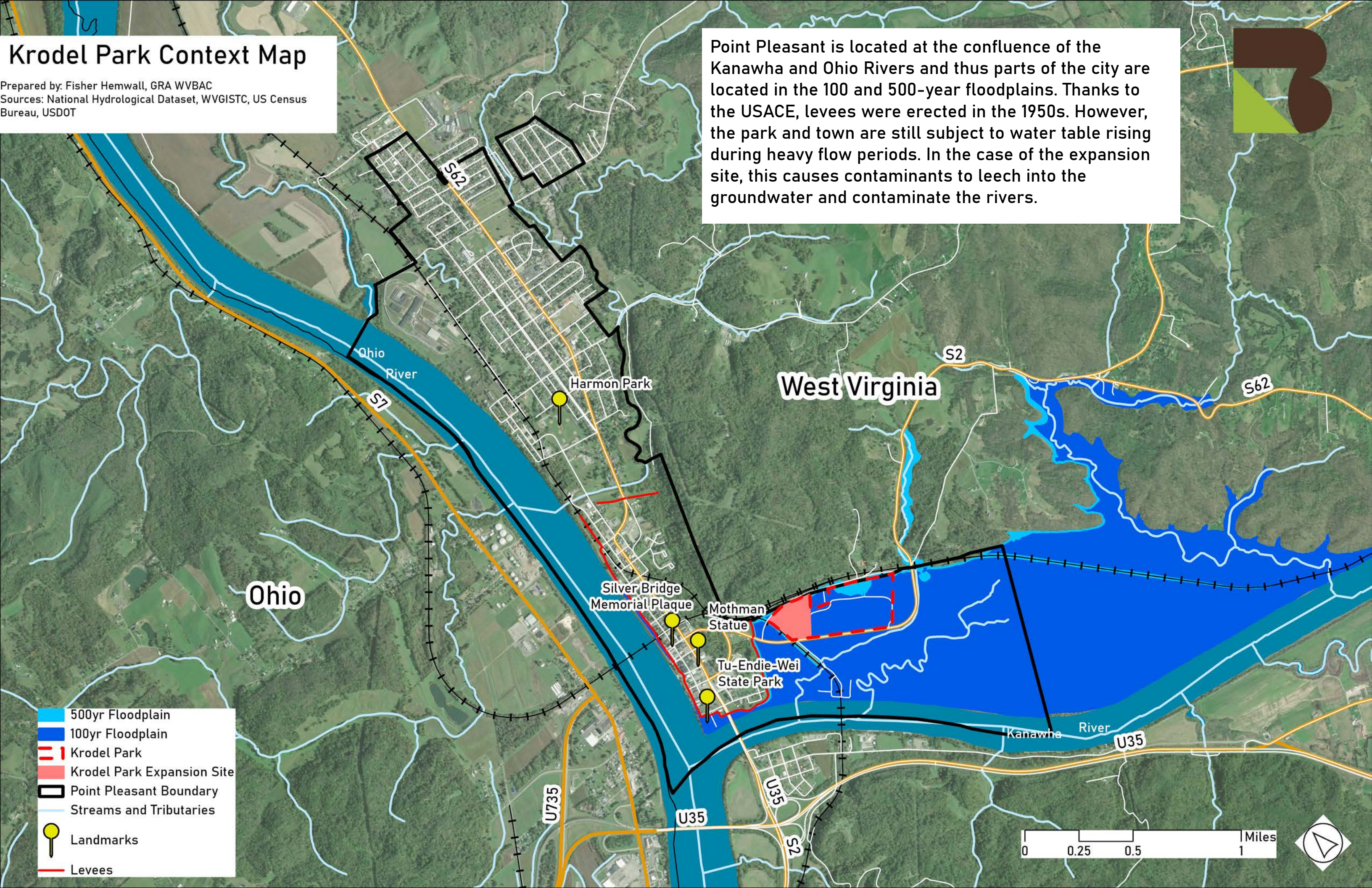
The City of Point Pleasant, WV is aiming to expand their Krodel Park in both size and amenities. Located within Mason County, WV, bordering Ohio, the park is currently consists of approximately 50 acres and serves as a recreation hub for the City with a lake and rental hut for water recreation, a walking trail, and a RV/Camper campground. The City acquired a neighboring parcel with 17.5 deeded acres to expand Krodel Park with tent camping opportunities, a viable floodplain ecosystem, and additional recreation amenities. This design proposal package was prepared by Fisher Hemwall to assist the City with the reuse planning of the site.



Krodel Park Context Map

Prepared by: Fisher Hemwall, GRA WVBAC
Sources: National Hydrological Dataset, WVGISTC, US Census Bureau, USDOT

Point Pleasant is located at the confluence of the Kanawha and Ohio Rivers and thus parts of the city are located in the 100 and 500-year floodplains. Thanks to the USACE, levees were erected in the 1950s. However, the park and town are still subject to water table rising during heavy flow periods. In the case of the expansion site, this causes contaminants to leech into the groundwater and contaminate the rivers.



- 500yr Floodplain
- 100yr Floodplain
- Krodel Park
- Krodel Park Expansion Site
- Point Pleasant Boundary
- Streams and Tributaries
- Landmarks
- Levees

0 0.25 0.5 1 Miles



Krodel Park Site Inventory: Land Use and Existing Amenities

Sources: WVGISTC

0 125 250 500 US Feet



Residential Trailer Park

RV Campground

Amenities: Laundry, playground, activity center, 5 picnic shelters

Fort Randolph

Reproduction of a Revolutionary War fort and site of Chief Cornstalk murder

Site access

Parking lot, boat launch and dock, kayak rental facilities

Site access

Legend

- Krodel Park Expansion Site
- Krodel Park
- Walkingpath
- Railroads
- Rivers
- Roads

Point Pleasant Parcels PropertyClass

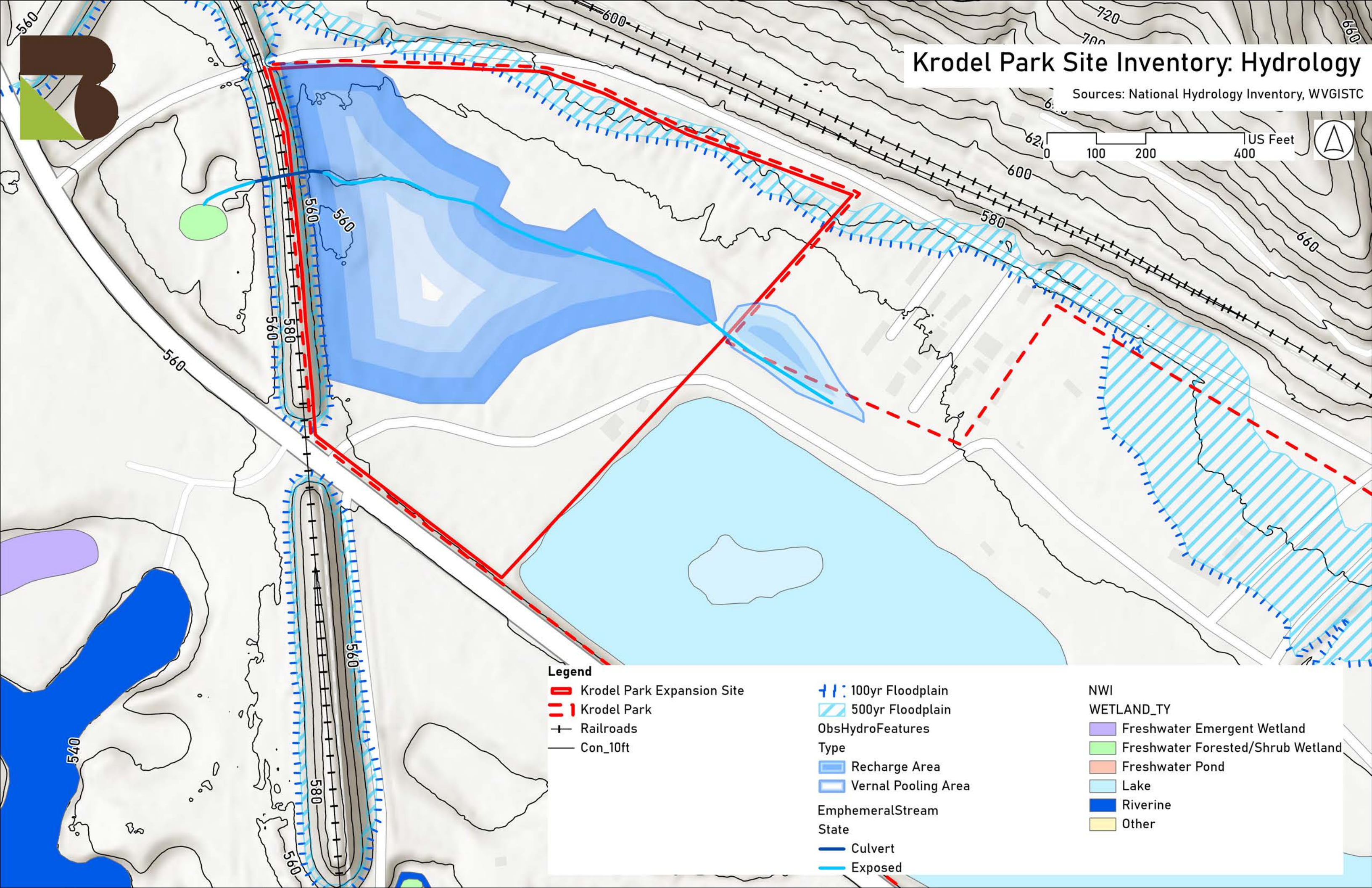
- Exempt, Govt, Other
- A
- C
- F
- R

Levees

KrodelExistingBuildings

Krodel Park Site Inventory: Hydrology

Sources: National Hydrology Inventory, WVGISTC



Legend

- Krodel Park Expansion Site
- Krodel Park
- Railroads
- Con_10ft

- 100yr Floodplain
- 500yr Floodplain
- ObsHydroFeatures
- Type
 - Recharge Area
 - Vernal Pooling Area

- EmphemeralStream
- State
 - Culvert
 - Exposed

- NWI
- WETLAND_TY
 - Freshwater Emergent Wetland
 - Freshwater Forested/Shrub Wetland
 - Freshwater Pond
 - Lake
 - Riverine
 - Other



Krodel Park Site Inventory: Contamination

Sources: National Hydrology Inventory, TechLaw, INC. (2010), WVGISTC



This map communicates where and what was flagged during the 2010 ESA Phase II, conducted by TechLaw. Although 16 years old, the assessment found that most of the contamination was located within the observed vernal pooling area. This confirms that the vernal pools are subjected to leachate. Of the recorded contaminants, no analytes of soil vapor were detected above their RSLs (Regional Screening Levels) or MCL (Maximum Contaminant Levels). Of the soil samples, almost all organic and inorganic compounds exceeded RSL but not MCL meaning there is very little contamination but it still exists. Whereas groundwater samples indicated an exceedance of MCL of the noted compounds in the respective mapped locations. This characterization of the groundwater being worse than the soils means the leachate is infiltrating the groundwater and water table.

Legend

- Krodel Park Expansion Site
- Krodel Park
- Railroads
- Con_10ft

ObsHydroFeatures

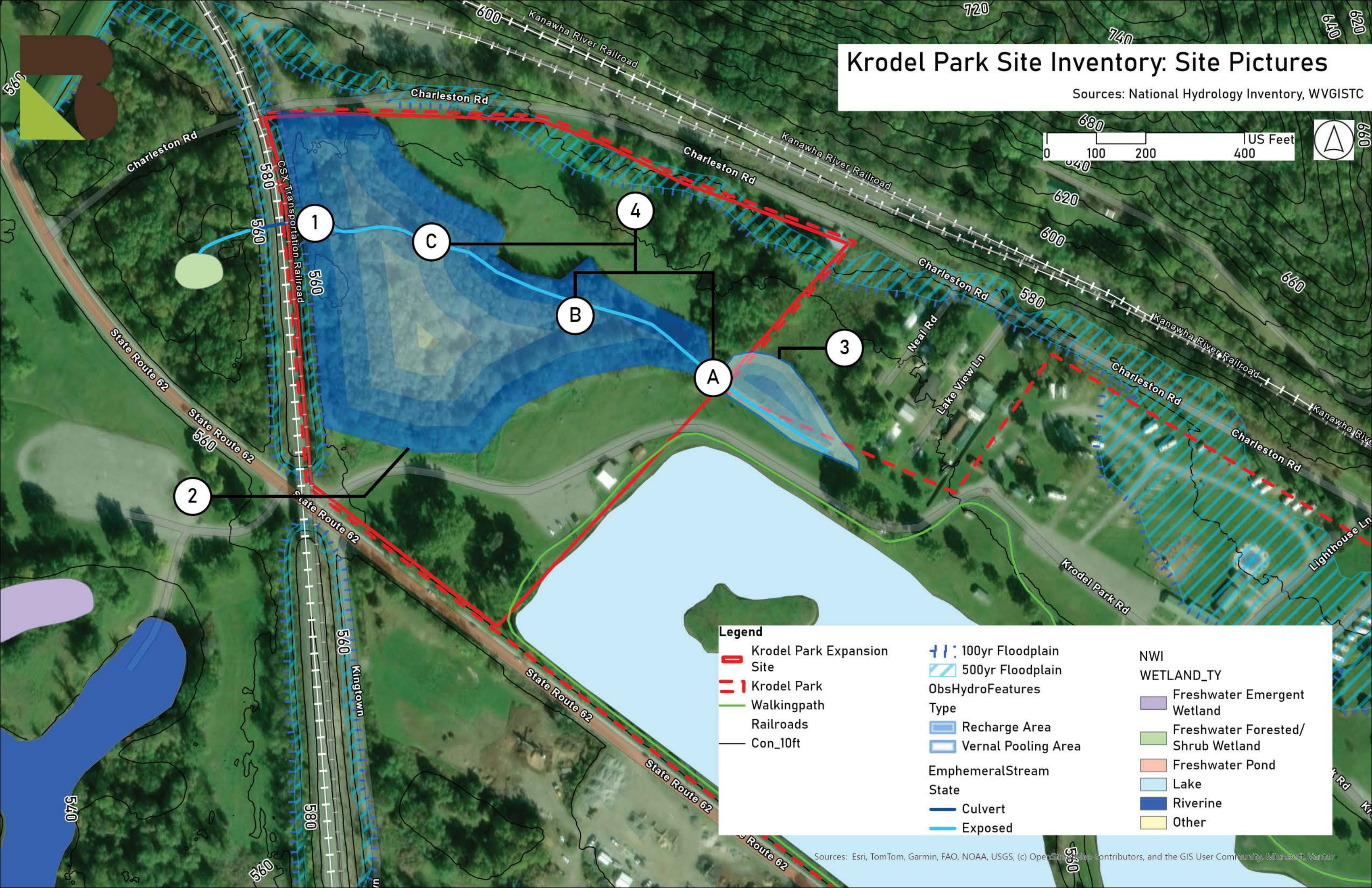
- Type**
 - Recharge Area
 - Vernal Pooling Area
- EmphemeralStream**
 - State**
 - Culvert
 - Exposed

Type

- Monitoring Well
- Test Pit
- SamplingArea

Krodel Park Site Inventory: Site Pictures

Sources: National Hydrology Inventory, WVGISTC



Legend

- Krodel Park Expansion Site
- Krodel Park
- Walkingpath
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ObsHydroFeatures

- 100yr Floodplain
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- Recharge Area
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NWI WETLAND_TY

- Freshwater Emergent Wetland
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- Riverine
- Other



Image 1

This is the culvert entrance for the stream to travel under the mound created for the railroad. In its current state, it is backed up and filled with leaf litter, requiring continual maintenance in its current state to prevent back up.



Image 2

These are just some of the vernal pools throughout the middle section. Its vegetation is common in a young forest or pole/sapling habitat. A vernal pool is the habitat where amphibians lay their eggs and allow their young to mature. However, since the whole section has these pocket depressions and is in the 100-year floodplain, this area is most likely a wetland rather than a vernal pool.



Image 3

Facing eastward, the recharge area, which lies along the border between the expansion parcel and the residential trailer park (see "Site Inventory: Land Use and Existing Amenities"). This area is drained by the onsite stream into the larger Forested Wetland (see "Site Inventory: Hydrology") as classified by the National Wetland Inventory. The species in this area are grasses and shrubs.



Image 4A

From left to right, the images were taken from east to west in order to capture the increase in water volume. As seen above the stream grows in size as it travels due west. This stream also bisects the parcel, however it lies within the young forested/sapling area vegetation structure of the parcel. The soil through which this stream flows is classified as urban fill and insitu observations identified trash within the soil. This is expected as the historical land use of the site was a landfill in the 60s-late 70s.



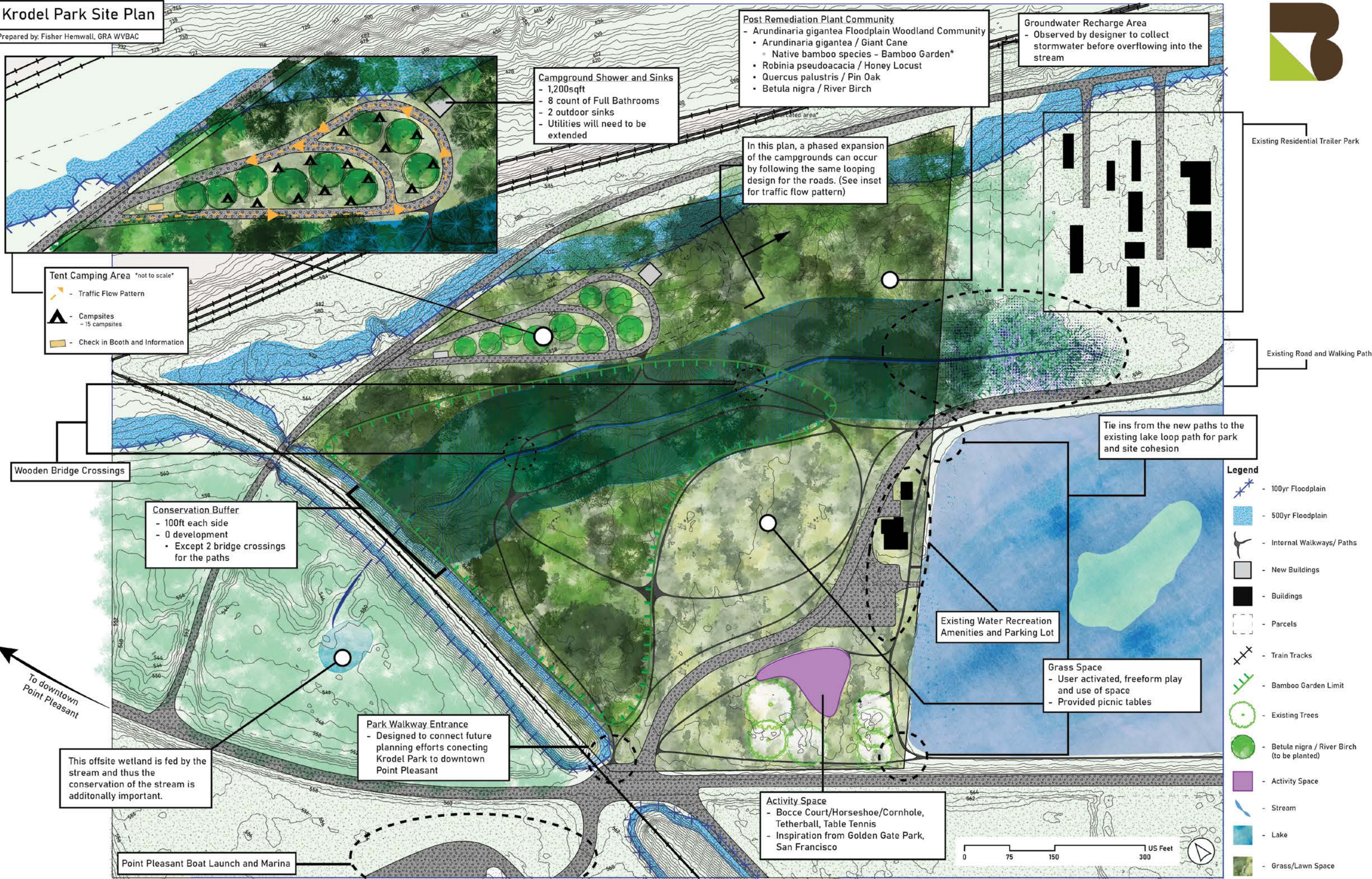
Image 4B

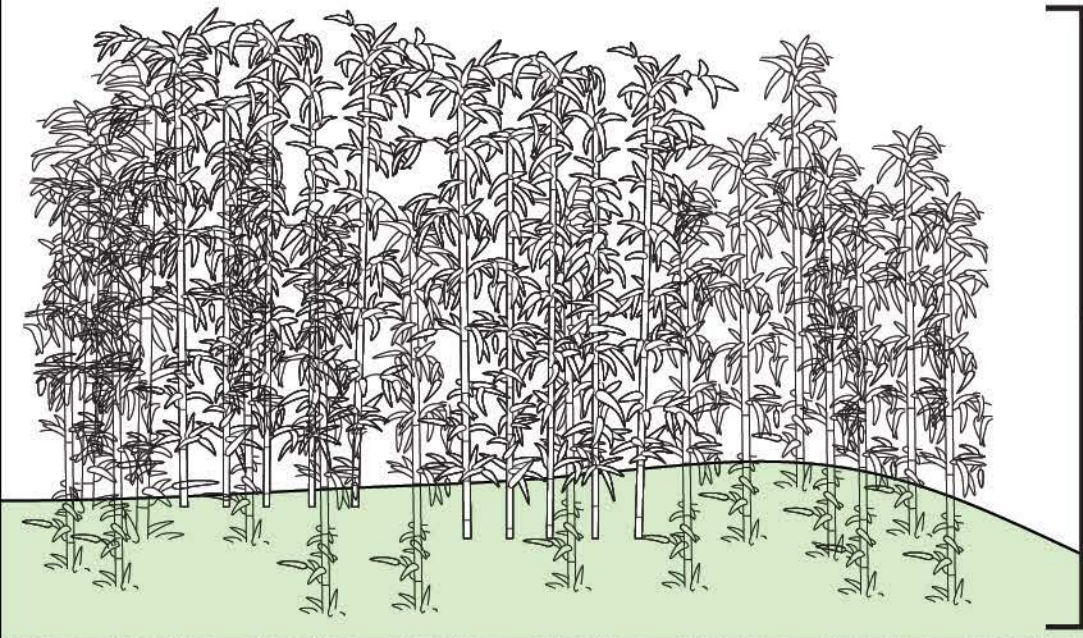


Image 4C

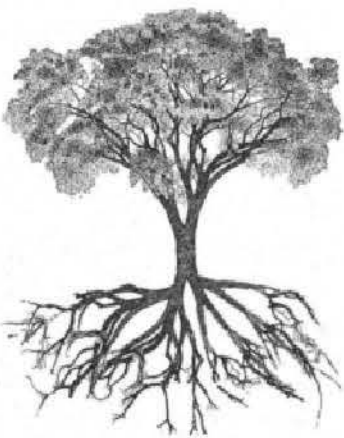
Krodel Park Site Plan

Prepared by: Fisher Hemwall, GRA WVBAC

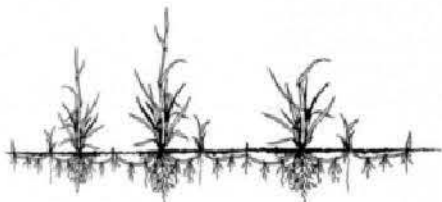




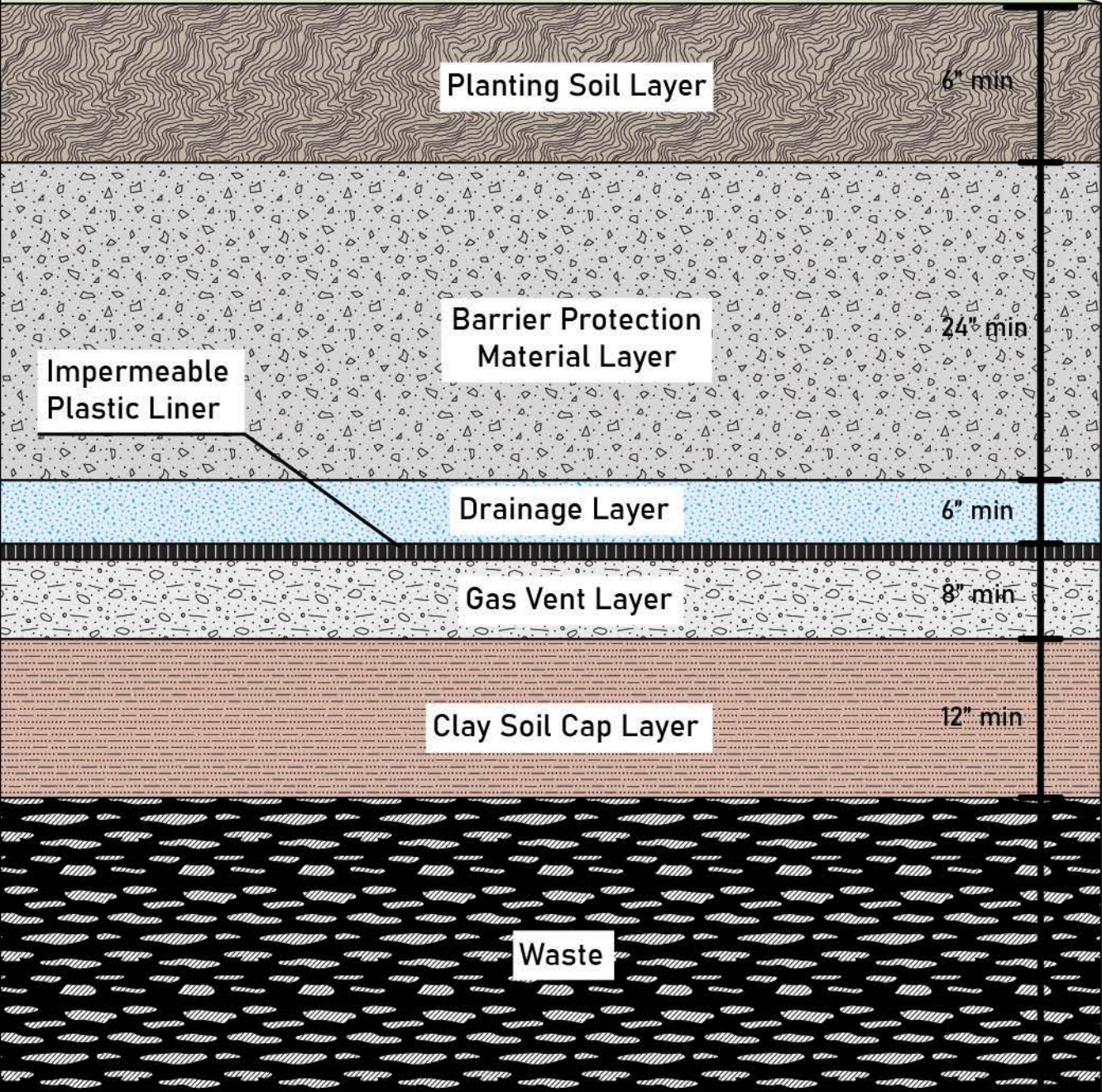
The proposal to plant Rivercane, a native bamboo species to the Ohio and Kanawha River Valley floodplains, comes from a combination of restorative design practice and root structure. Rivercane has a rhizome growth habit which means their roots grow shallow and densely. A soil cap remediation scheme is common for landfills and assumed for this site (confirm with LRS). Thus, the Rivercane roots would not break the impermeable liner as a tree would with their deep, strong roots. Below is a diagram of a soil cap that mimics the one constructed for the Fresh Kills landfill park on Staten Island, NYC.



Tree



Rhizome



- **Planting Soil Layer**
 - This layer is composed of organic material and other substrates that will prevent erosion and provide healthy growing material
- **Barrier Protection Material Layer**
 - The purpose of this layer is to protect the subsequent layers and provide water supply for passive intake from the Rivercane.
- **Drainage Layer**
 - The drainage layer reduces immediate water pressure on the Impermeable Plastic Liner and also mitigates any slipping of the liner. It works by increasing the water storage capacity and reducing oversaturation.
- **Impermeable Plastic Liner**
 - This liner acts as a barrier between the water and contaminants. It prevents the underground water infiltration from saturating and reaching the waste, thus preserving the groundwater from contamination before entering the on-site stream. Additionally, the liner impedes the upward flow of gas.
- **Gas Vent Layer**
 - The Gas Vent Layer is comprised of a geo-composite to allow the movement of landfill gasses toward gas vents/extraction wells.
- **Clay Soil Cap Layer**
 - The final layer is dumped, graded, then compacted with a heavy clay composition soil to maintain slope stability and proper drainage.

[*https://freshkillspark.org/landfill-engineering/covering-stabilizing-maintaining](https://freshkillspark.org/landfill-engineering/covering-stabilizing-maintaining)

Spotlight Species: *Arundinaria gigantea*, Rivercane



Arundinaria gigantea, or Rivercane is one of three native bamboo species to North America. Rivercane grows in stands (groupings of one plant species) called canebrake. These canebrake stands were once abundant along the Appalachian river and creek floodplain valleys until colonial expansion. White-colonial settlers decimated an estimated 98% of its historic range via agriculture, grazing and clear cutting.¹

1. <https://ntgisc.app.box.com/s/8tp57nb1c1gj65phadv5d8143ge21lu>

Cultural Keystone Species

Rivercane is also a cultural keystone species of several Tribal Nations in the Appalachian region. It is used as a fuel source, weaponry material, and ceremonial products across multiple Tribal Nations. The cultural importance of this species is so monumental the Rivercane Restoration Alliance (RAA) was created by US Army Corps of Engineers' Tribal Nations Technical Center of Expertise. This alliance holds public workshops and sessions hosted by Tribal leaders on incorporating Traditional Ecological Knowledge (TEK) into restoration science and conservation.²

Link to RAA Website: www.rivercanerestorationalliance.org

2. <https://www.spa.usace.army.mil/Missions/TNTCX/Traditional-Ecological-Knowledge/Rivercane-Restoration-Alliance/>



Native Ecological Importance

- Canebrakes are critical to riparian buffer zones (areas directly next to water features) by controlling erosion, stabilizing stream banks with its dense rhizome growth
- Rivercane can absorb loose sediment and other pollutants before they enter a waterway
- Their dense stands create habitat shelter for wildlife such as rabbits, turkey, deer, and others

Additional Links:

RAA Workshop Link:

<https://ntgisc.regfox.com/meet/us-ace-rivercane-workshop?access-token=407-121-175>

RAA Fact Sheet:

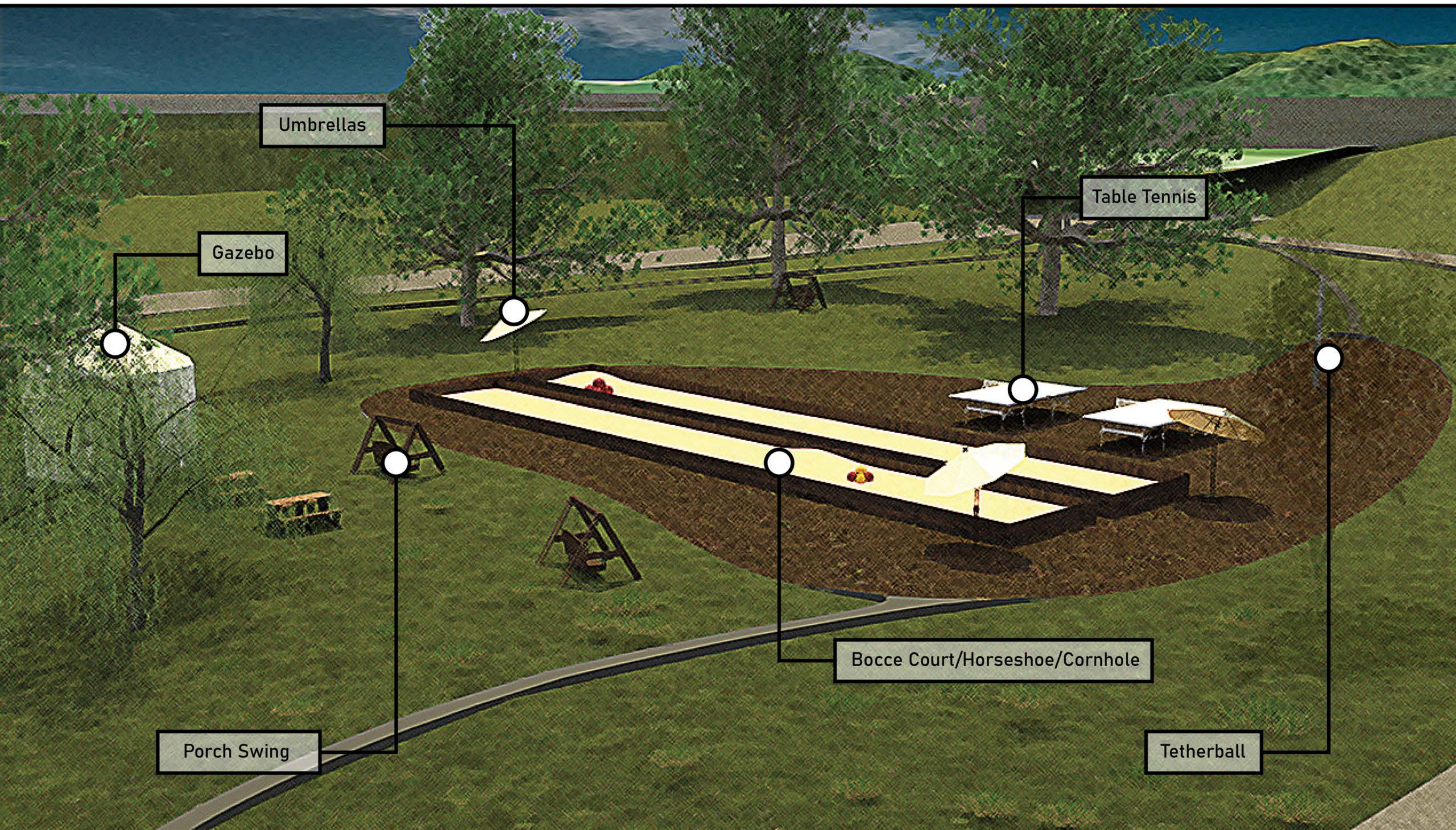
<https://ntgisc.app.box.com/s/8tp57nb1c-1gj65phadv5d8143ge21lu>

USACE Facts:

<https://www.spa.usace.army.mil/Missions/TNTCX/Traditional-Ecological-Knowledge/Rivercane-Restoration-Alliance/>



Activity Space Elements and Layout Diagram



WVDEP Non-Point Source Program

<https://dep.wv.gov/WWE/Programs/nonptsource/Pages/home.aspx>

WVDEP Non-Point Source Additional Grant Opportunities

<https://dep.wv.gov/WWE/Programs/nonptsource/Pages/AGO.aspx>

FEMA Community Assistance

<https://www.fema.gov/floodplain-management/community-assistance-program>

Rivercane Restoration Alliance

<https://www.rivercanerestorationalliance.org/>

United States Army Corps of Engineers Page on Rivercane

<https://www.spa.usace.army.mil/Missions/TNTCX/Traditional-Ecological-Knowledge/Rivercane-Restoration-Alliance/>

Rivercane Restoration Alliance Workshop Sharepoint

<https://ntgisc.regfox.com/meet/usace-rivercane-workshop?access-token=407-121-175>

USACE Formerly Utilized Sites Remedial Action Program

<https://www.usace.army.mil/Missions/Environmental/FUSRAP/>

Tribal Leaders Directory

<https://www.bia.gov/service/tribal-leaders-directory>

Recommended Action Steps

- 1. Begin to draft an RFP 30% design for utilities and infrastucture
- 2. Connect and partner with regional tribal leader to coordinate the restoration of Rivercane (Seneca or Monacan is recommended)
- 3. Begin to fund the supplies for the activity space (Tennis Tables, etc)
- 4. Research funding sources for restoration planting since it is a “Cultural Keystone Species”

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