City of Columbus Type III Variance Application

Buckeye Rail Yard Redevelopment

4882 Trabue Road

Columbus, Franklin County, Ohio

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Kimley»Horn

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Executive Summary

Kimley-Horn and Associates, Inc. (Kimley-Horn) acting on behalf of Buckeye XO, LLC, is submitting a City of Columbus Type III Variance Request per the requirements of the City of Columbus Stormwater Drainage Manual (SWDM) for the proposed encroachment within the Stream Corridor Protection Zone (SCPZ) including relocation and restoration of five (5) streams (two intermittent, three perennial) and two (2) wetlands (one forested, one emergent) for the proposed Buckeye Rail Yard Redevelopment project. Comments and associated edits/updates have been encompassed from the previous variance request submittal.

The property/study area encompasses approximately 279.19 acres of former Norfolk-Southern rail yard acreage located at approximately 4882 Trabue Road (north of Trabue Road and south of Roberts Road), Columbus, Franklin County, Ohio 43228, herein referred to as the “Site”. The Franklin County Auditor’s office identifies the Site as parcel numbers 560-154558 and 560-184817.

Based on the currently proposed impacts to jurisdictional waters of the United States and waters of the State of Ohio, Kimley-Horn and Buckeye XO, LLC have also submitted a USACE Section 404 Individual Permit Application (USACE ID No: LRH-2021-551-SCR) and an Ohio EPA Section 401 Water Quality Certification Application (Ohio EPA ID No: 227686A). The USACE Individual Permit application is currently under review and anticipated to be authorized in the following weeks, while the authorized Ohio EPA 401 WQC was issued effective September 22, 2022. Applicable documentation can be provided upon request.

Section 1: Introduction

Land within the Site currently consists primarily of former Norfolk-Southern railroad acreage, including former rail lines, ballast material, ancillary structures, open areas, waste land, extensive graveled areas, and unmaintained woods. The previously completed wetland/stream delineation reports and associated USACE Preliminary Jurisdictional Determinations indicate that five (5) streams, two (2) wetlands, and one (1) pond are currently located on the Site (all jurisdictional). Approximately 50-acres of unmaintained wooded land is located on the northwestern portion of the Site, which has generally grown unmaintained since the conversion of the Site from agricultural use prior to the early 1970's to the development of the Site as a rail yard.

1.1 Purpose and Need

The project purpose is to provide large-scale industrial logistics warehouse space with proximate access to the Interstate Highway System and rail line transportation in the west Columbus area to meet local and regional distribution demands.

The project need is to mitigate the impact of the covid-19 pandemic on retail distribution and ecommerce demands and associated product shortages/availability within Central Ohio and the Midwest. The proposed site would allow for substantial supply and last-mile access to meet continued growth trends, while relying on the diverse and skilled local workforce of central Ohio.

The proposed project is the construction of eight (8) commercial/industrial warehouse buildings totaling approximately 4.1m square feet on the previous Buckeye Rail Yard property located in Columbus, Ohio. The project and structures will be centrally located within Ohio and the midwestern United States while allowing for transportation access to the existing Norfolk Southern rail line service, nearby interstates I-70 and I-71, and Rickenbacker International Airport.

To facilitate proposed development of the Site, Buckeye XO, LLC, is proposing to impact 0.78 acre of jurisdictional wetland habitat, 0.23 acre of jurisdictional pond habitat, and the relocation and restoration of five (5) jurisdictional streams on the Site, totaling 7,412 linear feet of stream habitat. Mitigation for impacts to jurisdictional stream habitat on-site will be completed through the relocation and restoration of approximately 8,283.00 linear feet of open stream channel and 1,189.00 linear feet of encapsulated (piped) stream channel, resulting in a total of 9,472.00 linear feet of relocated on-site stream channel. Mitigation for impacts to 0.78 acre of jurisdictional wetland habitat on-site will be completed through the creation of 0.96 acre of wetland habitat on-site (0.57 acre forested, 0.39 acre emergent), while mitigation bank credits have also been purchased to meet USACE and Ohio EPA mitigation hierarchy obligations. The relocated and restored stream channel and associated created wetlands will be completed using natural channel design methods in an effort to restore the historically channelized and impacted streams from the original development of the buckeye rail yard site in the late 1960's. Once completed, the relocated and restored streams are anticipated to consist of a sinuous/meandering stream channel with diverse stream channel habitat that will improve overall downstream water quality through decreased siltation and turbidity associated with the high amounts of erosion created from the existing channelized streams. Created wetland habitat is anticipated to mimic current wetland functionality with overall improvements in species abundance, diversity, and management of invasive species.

The relocated and restored stream and wetland habitat on-site will include 24.19 total acres of SCPZ (inclusive of stream open channel and piped portions, and wetland habitat); an increase of approximately 3.858 acres total over existing.

1.2 Project Background

Buckeye Rail Yard (BUK) was one of five (5) CSX/Norfolk Southern intermodal terminals in Ohio, with others located in Cincinnati, Cleveland Marion, and north Baltimore. Per available information provided by online resources, rail yard construction started in 1968 and was at least complete enough for operations to begin by December 1969.

Buckeye Yard was one of Penn Central Transportation Company's (Penn Central) first significant projects, replacing several old and outmoded yards on the Pennsylvania Railroad (PRR) and New York Central Railroad (NYC) lines around Columbus. The Buckeye Yard site was an entirely new yard built on farmland, connecting to three Penn Central main lines west of Columbus. Historically, Buckeye Yard was an important location for auto part distribution from plants in northern Ohio to the southern United States. To further emphasize the importance of the rail yard, in 2011, CSX Transportation (CSX) announced a $59 million expansion of the east-adjoining intermodal freight terminal facility, which was competed in 2013 and added 24 additional acres and doubled capacity from 180,000 to 360,000 cargo lifts per year. The expansion was fueled by the need for anticipated growth in the surrounding area and regional business development by linking deep water east coast ports with Midwestern markets.

Unfortunately, through the years and as a result of a variety of railroad company changes and associated closures, abandonments, and decreasing carload traffic which was further driven by the 2008 recession, Norfolk Southern planned to close the Buckeye Yard Site circa 2008. The rail yard was closed in 2009 with Norfolk Southern planning to scrape the land and sell it. The east-adjoining CSX intermodal freight facility remains highly active to this day.

Buckeye XO, LLC, a special-purpose entity (SPE) of Xebec Holdings, LLC, completed purchase of the Buckeye Rail Yard Site in July 2022. The applicant considered multiple other locations for purchase before ultimately settling upon the purchase of the Buckeye Rail Yard Site. The purchase of the Site represented a truly unique opportunity for industrial warehouse logistics development in the area due to its size, zoning, adjacent freight terminal facility, continued rail line connection, and intermodal connectors that provide CSX and Norfolk Southern direct access to the yard site including Roberts Road, Westbelt Drive, and Trabue Road, as well as direct access to the facility via I-270 with nearby access I-70 and I-71.

Based on the alternative analysis of off-site and on-site development options which is further discussed in detail in (Section 3), the Preferred Alternative Development Plan was ultimately selected as it provides enough buildable land on the Site to fulfill the proposed project purpose and need that was initially intended based on the Site's location, size, costs, and other associated inputs (zoning, generally previously developed, direct access to intermodal facilities, etc), while allowing for a substantial amount of aquatic impacts to be appropriately mitigated for on-site through associated relocation and restoration.

In January 2022, on behalf of the applicant, Kimley-Horn prepared and submitted a USACE Section 404 Individual Permit Application and Ohio Environmental Protection Agency (Ohio EPA) Section 401 Individual Water Quality Certification Application for proposed impacts to jurisdictional waters of the U.S. located on the Site. The USACE Individual Permit application is currently under review and anticipated to be authorized in the following weeks, while the authorized Ohio EPA 401 WQC was issued effective September 22, 2022. Details regarding proposed impacts to jurisdictional surface waters are further discussed in Section 3.1.

1.3 Existing Site Conditions

The Site encompasses approximately 279.19 acres of former Norfolk-Southern rail yard acreage, which includes approximately 50-acres of woods located on the western side of the Site. The remaining portions of the Site consist of removed rail line areas, ballast material, ancillary structures, open areas, waste land, concrete parking lots and extensive graveled areas.

According to the previous wetland/stream delineations and revised U.S. Army Corps of Engineers (USACE) Preliminary Jurisdictional Determination (PJD) dated June 14, 2022, five (5) jurisdictional streams are present on the Site (Stream 9, 10, 11, 12, 13) encompassing 7,412 linear feet; two (2) jurisdictional wetlands

(Wetland 7, 8) encompassing 0.78 acres; and one jurisdictional pond (Pond 1) encompassing 0.23 acres are currently located on the Site. No non-jurisdictional (isolated) aquatic resources are located on the Site. Surface hydrology from Stream 10 flows through Pond 1 and continues north. Overall, surface water hydrology on the Site is essentially split in middle with Stream 9 and Stream 10 flowing north/northeast and then turning east (downstream) away from the Site, and Stream 11, 12 and 13 flowing south/southeast (downstream) away from the Site before flowing east into the Scioto River (0506001-12-05, Dry Run-Scioto River).

The rail yard Site was developed in the late 1960's and early 1970's. According to the review of historical aerial/satellite images (Appendix N), the majority of the Site was composed of agricultural land prior to Site development in the late 1960's. Drainageways are present on-site in the 1950's although likely altered historically by that point due to the agricultural use of the area. According to the review of the 1970 aerial photograph, the Site is depicted as generally constructed with heavy grading present and all streams located within the Site having been significantly altered by means of rerouting and channelization. Little to no effort was given to provide a natural stream design or associated riparian habitat during the stream relocation process and development of the rail yard, which is clearly evident. The streams appear to have been re-routed around the railyard area through a common channel/ditch which is the currently delineated Stream 11 channel. The streams are depicted as straight with no provided sinuosity or riparian/or streambank vegetation present, while the two (2) wetland habitat areas developed naturally overtime.

Based on the review of historical aerial/satellite images and further site evaluation reconnaissance and stream habitat assessment that was conducted by Kimley-Horn, on-site stream channels generally exhibit modified warm water habitat characteristics due to historical impacts resulting in channelization, limited stream channel substrate, limited flow and stream channel habitat (no defined riffle/run or pool habitat) and a limited stream riparian corridor that has been unmaintained and partially dominated by invasive species (Honeysuckle, *Lonicera* spp.). On-site wetland habitat currently exhibits Category 2 (moderate quality) forested and emergent habitat characteristics with a prevalence of invasive/non-native Reed Canary Grass (*Phalaris arundinacea*) located in the emergent wetland habitat area (Wetland 8).

Current on-site aquatic resources include the following:

Stream 9: 320.00 linear feet, Intermittent, Modified Class II PHWH (HHEI 60), Jurisdictional
Stream 10: 2,552.00 linear feet, Perennial, Modified Class II PHWH (HHEI 59), Jurisdictional
Stream 11: 3,921.00 linear feet, Perennial, Modified Warmwater (QHEI 32.5), Jurisdictional
Stream 12: 369.00 linear feet, Perennial, Modified Warmwater (QHEI 32.5), Jurisdictional
Stream 13: 250.00 linear feet, Intermittent, Modified Class II PHWH (HHEI 64), Jurisdictional

Wetland 7 – 0.49 acre, Category 2 (ORAM Score 49), Palustrine Forested (PFO), Jurisdictional
Wetland 8 – 0.29 acre, Category 2 (ORAM Score 38), Palustrine Emergent (PEM), Jurisdictional
Pond 1 – 0.23 acre, open water (partial impoundment of Stream 10), unconsolidated bottom, Jurisdictional

No non-jurisdictional (isolated) aquatic resources were identified or delineated as occurring on the Site. The streams and other aquatic resources are further discussed in Section 4.2, and applicable habitat assessment scoring datasheets can be found in Appendix H.

SPCZ Widths on Existing Stream

Typically, the current SCPZ widths for the existing streams would have been determined using the following equation, which is referenced in Section 1.3.1 of the City of Columbus Stormwater Drainage Manual, where the drainage area would have been calculated using USGS StreamStats at the point where hydrological flow enters the Site:

Stream Corridor Protection Zone, in feet of width[1] = $147(DA)^{0.38}$

Where DA = drainage area of the stream in square miles

However, based on correspondence received from the City of Columbus associated with the storm water systems located upstream of the Site and associated streams which enlarged the applicable stream drainage areas, Kimley-Horn has utilized drainage area calculations based on Atlas Maps GIS for the applicable City storm water drainage systems which is more representative of each feature and was further recommended by the City. Representative stream drainage areas (Atlas Maps) are provided for each of the five (5) streams in Appendix G. The current existing SCPZ calculations for each stream are summarized below:

Stream 9: Calculated GIS drainage area is 0.57 mi^2. SCPZ width = $147(0.57)^{0.38}$ = 119' wide total existing SCPZ or 59.5' per bank from stream channel center.

Stream 10: Calculated GIS drainage area is 0.40 mi^2. SCPZ width = $147(0.40)^{0.38}$ = 104' wide total existing SCPZ or 52' per bank from stream channel center.

Stream 11: Calculated GIS drainage area is 0.45 mi^2. SCPZ width = $147(0.45)^{0.38}$ = 109' wide total existing SCPZ or 54.5' per bank from stream channel center.

Stream 12: Calculated GIS drainage area is 0.30 mi^2. SCPZ width = $147(0.30)^{0.38}$ = 93' wide total existing SCPZ or 46' per bank from stream channel center.

Stream 13: Calculated GIS drainage area is 0.24 mi^2. SCPZ width = $147(0.24)^{0.38}$ = 85' wide total existing SCPZ or 42.5' per bank from stream channel center.

Section 2: Variance Submittal Requirements

2.1 Reasoning for Variance Request

Kimley-Horn, acting on behalf of Buckeye XO, LLC, is submitting this variance request to the City of Columbus for proposed encroachment within the SCPZ as part of the proposed development project and associated relocation and restoration of five (5) streams (two intermittent, three perennial), fill and creation of two (2) wetland habitat areas, and fill of one (1) pond for the proposed Buckeye Rail Yard Redevelopment project.

2.1.1 Variance Type Requested

Kimley-Horn is requesting variances from the following SWDM section and sub-sections for the Preferred Impact Development Plan alternative for the development of the Site:

1. SWDM Section 1.1 and 1.3.3 (Table 1-1): On-site relocation/restoration and the filling of approximately 7,412 linear feet of five (5) unnamed, jurisdictional headwater tributaries to the Scioto River, indicated below:

   Stream 9: 320.00 linear feet, Intermittent, Jurisdictional (Modified Class II PHWH)
   Stream 10: 2,552.00 linear feet, Perennial, Jurisdictional (Modified Class II PHWH)
   Stream 11: 3,921.00 linear feet, Perennial, Jurisdictional (Modified Warmwater)
   Stream 12: 369.00 linear feet, Perennial, Jurisdictional (Modified Warmwater)
   Stream 13: 250.00 linear feet, Intermittent, Jurisdictional (Modified Class II PHWH)

2. SWDM Section 1.3.3 (Table 1-1): Associated riparian impacts (tree/vegetation removal) in the SCPZ of the proposed relocated/restored and filled stream sections and wetland/pond areas totaling approximately 20.332 acres of existing SCPZ:

   Stream 9: 320.00 linear feet, 119' wide SCPZ
   Stream 10: 2,552.00 linear feet, 104' wide SCPZ
   Stream 11: 3,921.00 linear feet, 109' wide SCPZ
   Stream 12: 369.00 linear feet, 93' wide SCPZ
   Stream 13: 250.00 linear feet, 85' wide SCPZ
   Wetland 7: 0.49 acre, 0.49 acre SCPZ area
   Wetland 8: 0.29 acre, 0.29 acre SCPZ area
   Pond 1: 0.23 acre, 0.23 acre SCPZ area

   Stream corridor protection zone (SCPZ) widths were enlarged and adjusted at points of stream confluences to account for combined flows, yielding the overall 20.332 acres of current SCPZ on-site.

3. SWDM Section 1.3.3 (Table 1-1) and 1.5: On-site filling of two (2) jurisdictional wetlands; and one (1) jurisdictional pond that are located within the SCPZ and indicated below:

   Wetland 7 – 0.49 acre, Category 2, Palustrine Forested (PFO), Jurisdictional
   Wetland 8 – 0.29 acre, Category 2, Palustrine Emergent (PEM), Jurisdictional
   Pond 1 – 0.23 acre, partial impoundment of Stream 10, Jurisdictional

2.1.2 Summary – Impact to Stream, SCPZ, Water Quality, Water Quantity

Granting of the requested variances, in addition to approval of applicable USACE and Ohio EPA Section 404/401 waterway permitting, would allow all five (5) streams to be relocated and restored along the western portion of the Site. On-site wetland habitat would be compensated for the creation of on-site wetland habitat at a proposed ratio slightly above 1:1, yielding 0.96 acres of created onsite wetland habitat (0.57 acre forested, 0.39 acre emergent), per the City of Columbus Stormwater Drainage Manual (SWDM)

guidance. Furthermore, in an effort to meet the U.S. Army Corps of Engineers (USACE) and Ohio EPA wetland mitigation hierarchy requirements in accordance with 33 C.F.R. Part 332, ORC 6111.30(I), and OAC 3745-1-54, 1.9 wetland mitigation bank credits have also been secured through the Wetland Resource Center at their Little Scioto Wetlands Mitigation Bank for proposed impacts to jurisdictional forested (2.5:1 mitigation ratio) and emergent (2:1 mitigation ratio) wetland habitat. The noted wetland mitigation bank is located within the same 8-digit HUC of the Site (05060001, Upper Scioto). The relocation/restoration and associated stream, wetland, and pond filling are a necessity based on the proposed/preferred Site development alternative.

The rail yard was developed in the late 1960's and early 1970's. According to the review of historical aerial/satellite images (attached), the majority of the Site was composed of agricultural land prior to Site development in the late 1960's. Drainageways are present on-site in the 1950's although likely altered historically somewhat by that point due to the agricultural use of the site. According to the review of the 1970 aerial photograph, the site is depicted as generally constructed with heavy grading present and all streams located within the Site having been significantly altered by means of rerouting and channelization. The streams appear to have been re-routed around the railyard area through a common channel/ditch which is the currently delineated Stream 11 channel. The streams are depicted as straight with no sinuosity or riparian/stream bank vegetation present. Overall, the streams on-site have been historically channelized and entrenched, which has resulted in limited stream functionality and channel habitat and anticipated lowering of down-stream water quality due to increased erosion and turbidity.

As the existing on-site stream channels generally exhibit modified warm water habitat characteristics due to historical impacts resulting in channelization, limited stream channel substrate, flow channel habitat (no defined riffle/run or pool habitat) and a limited stream riparian corridor; the relocation and restoration of streams on-site is anticipated to result in significant habitat improvements which will aid and benefit the surrounding and downstream area watershed. The proposed relocated and restored stream channels and associated SCPZ areas on-site are anticipated to yield an overall long-term improvement in water quality due to the restoration of beneficial stream channel bottom substrate and in-stream habitat, stream bank vegetation establishment, stream corridor woody tree and shrub plantings, and restoration of stream channel sinuosity and associated floodplain. These improvements will further increase the diversity of habitat for aquatic macroinvertebrates, fish and amphibians, which is generally lacking in the existing stream channels.

Currently, approximately 7,412 linear feet of jurisdictional intermittent and perennial stream habitat and 0.78 acre of jurisdictional forested/emergent wetland habitat is present on the Site. The proposed relocation and restoration of on-site stream habitat would result in approximately 8,283.00 linear feet of open stream channel and 1,189.00 linear feet of encapsulated (piped) stream channel, resulting in a total of 9,472.00 linear feet of relocated on-site stream channel. The proposed relocation and restoration length is at an approximately 1:1 ratio for the open stream channel portions, and higher if proposed piped stream portions are included. Onsite wetland habitat creation is anticipated to result in 0.96 acre of jurisdictional forested and emergent wetland habitat (0.57 acre forested, 0.39 acre emergent), thus maintaining a 1:1 on-site replacement ration per the City of Columbus SWDM guidance. A copy of the proposed Stream Relocation Plan and Wetland Planting Plan are provided in Appendix E (relocated streams have generally been referred to as Stream A and Stream B with associated tributaries, to take into account modified drainage and SCPZ areas at the points of confluence as the streams proceed downstream).

Furthermore, in an effort to meet the U.S. Army Corps of Engineers (USACE) and Ohio EPA wetland mitigation hierarchy requirements in accordance with 33 C.F.R. Part 332, ORC 6111.30(I), and OAC 3745-1-54, 1.9 wetland mitigation bank credits have been secured through the Wetland Resource Center at their Little Scioto Wetlands Mitigation Bank for proposed impacts to jurisdictional forested (2.5:1 mitigation ratio) and emergent (2:1 mitigation ratio) wetland habitat, which is further outlined below.

Stream Impacts (7,412.00 linear feet; 12,360.00 CY fill total)
Stream 9 - 320.00 linear feet
Stream 10 - 2,552.00 linear feet

Stream 11 - 3,921.00 linear feet
Stream 12 - 369.00 linear feet
Stream 13 – 250.00 linear feet
Total proposed stream impacts = 7,412 linear feet
Total on-site proposed stream relocation/restoration = 9,472.00 linear feet (incl 1,189.00 lf piped)
Total on-site proposed open stream channel (total above – proposed piped) = 8,283.00 linear feet

Wetland Impacts (0.78 acre total; 6,860.21 CY fill total)
Wetland 7 – 0.49 acre, Category 2, Palustrine Forested (PFO)
Wetland 8 – 0.29 acre, Category 2, Palustrine Emergent (PEM)
Total on-site proposed impact = 0.78 acre (0.49 acre forested, 0.29 acre emergent)
Total on-site proposed wetland creation = 0.96 acre (0.57 acre forested, 0.39 acre emergent)

Wetland Mitigation Credits required per USACE and Ohio EPA
Wetland 7 – 0.49 acre, Category 2, Palustrine Forested (PFO) – 0.49 acre x 2.5 = 1.3 credits needed
Wetland 8 – 0.29 acre, Category 2, Palustrine Emergent (PEM) – 0.29 acre x 2.0 = 0.6 credits needed
Total wetland credits needed/required = 1.9 mitigation bank credits
Total wetland credits currently reserved/paid for through WRC = 1.9 mitigation bank credits

Pond Impacts (0.23 acre total; 1,484.42 CY fill; 18.16 CY cut total)
Pond 1 (0.23 acre) – the applicant is not proposing any mitigation for the pond area at this time. As Stream 10 flows through Pond 1, the linear footage of the stream has been encompassed as mitigation within the total stream impacts and proposed on-site mitigation listed above.

The proposed new SCPZ within the relocated stream areas and created wetland areas will be approximately 24.19 acres in total, yielding an increase of 3.858 acres of relocated SCPZ over the current 20.332 acres SPCZ area. Plantings of native and non-invasive tree and shrub species in the SCPZ of the relocated streams and created wetland habitat areas is anticipated to increase overall habitat quality and wildlife use when compared to many of the low quality, fast growing and short-lived tree species currently located within the SPCZ, in addition to very few trees being located on the eastern portion of the SPCZ due to its historical channelized located directly adjacent to the rail yard.

Per the plan notes, Stream corridor protection zone (SCPZ) widths were enlarged and adjusted at points of stream confluences to account for combined flows, yielding the overall indicated 20.332 acres of current SCPZ on-site and 24.19 acres of proposed SCPZ on-site. Please refer to the plan set for the associated proposed SCPZ area breakdown provided in Appendix E.

Stream 10 flows north into Stream 9 which proceeds to flow east (downstream) under the existing railyard area through a 60” corrugated metal culvert, while Stream 11 and 12 flow east and then turn south and continue to flow south/southeast before flowing offsite trough a 72” corrugated metal culvert. The proposed stream relocation is anticipated to maintain these locations for the hydrological flow transition off-site (downstream).

The proposed build of the relocated stream channels will incorporate a natural design including a pool/riffle-based design to facilitate the reestablishment of habitat within the stream corridor areas that was likely historically present before prior to redevelopment of the area for agricultural and then industrial uses for the rail yard. Due to the historical re-routing and channelization of the streams when the rail yard was originally built in the 1960’s and 1970’s, limited to no riffle/pool habitat or high-quality stream bed substrate current exists within the stream channels. The streams were moved and excavated in a manner to convey water through and away from the Site as quickly as possible without the intention of creating beneficial stream habitat. The proposed stream relocation and habitat restoration will restore natural steam sinuosity and in-channel habitat that is anticipated to significantly increase the diversity of habitat for aquatic macroinvertebrates, fish and amphibians which is generally lacking in the existing stream channels.

Anticipated stream hydrology flowing onto and through the Site is anticipated to remain at current stream flow rates or increase somewhat due to the restoration of stream habitat. Kimley-Horn is proposing a five

(5) year monitoring period (subject to USACE and Ohio EPA approval) that will provide an adequate timeline for the relocation/restoration of on-site stream habitat, yearly habitat monitoring and assessment calculations, SCPZ plantings, and associated recommendations modifications if the established stream performance criteria are either not met or not on a positive trajectory to being met. The proposed Stream and Wetland Mitigation Plan is further being revised to address additional City of Columbus requirements and recent comments. A copy can be forwarded upon request once complete. Kimley-Horn considers the proposed design a substantial benefit to the streams on-site as well as the immediate and downstream watershed area, which has been historically altered and modified for a variety of development types.

2.1.3 Summary – Substantial Hardship/Land Use Deprivation Related to SWDM Comp

As previously referenced in Section 1.1, The project purpose is to provide large-scale industrial logistics warehouse space with proximate access to the Interstate Highway System and rail line transportation in the west Columbus area to meet local and regional distribution demands; while the project need is to mitigate the impact of the covid-19 pandemic on retail distribution and ecommerce demands and associated product shortages/availability within Central Ohio and the Midwest. Due to the location of the existing, historically impacted streams being on the western portion of the Site, complete avoidance of impacts within the SCPZ portion of the Site would result in the loss of well over over 100-acres of usable and developable acreage, resulting in a significant financial hardship for the Site owner as the property has already been purchased for a substantial fee which was based on the Site's location, size, zoning, construction feasibility, direct Norfolk-Southern rail access, nearby access to I-270 and Interstate I-70, and other applicable inputs (surrounding area workforce, affordable living, etc.).

While smaller warehouse structures could potentially be developed and placed on the Site to avoid impacts within the existing SCPZ (thus maintaining compliance with the SWDM, as indicated in the No Impact Development Plan below), the resulting buildable land reduction would further influence buildable infrastructure on the site and associated under roof square footage. On a typical industrial development site, the industry standard you look to achieve is 35-40% minimum site coverage, and on a property as large as this Site, maximizing coverage is essential. Additionally, in today's industrial market the building sizes that are performing the strongest are the large (800k+ square feet) and mid-size (200k-500k) industrial structures/developments. Avoiding impacts to the majority of the stream habitat and SCPZ on-site would result in the loss of nearly 4-million square feet of building square footage, which is the majority of buildable coverage across the ~280-acre Site.

As the Site was specifically selected and purchased for its size, centralized location, intermodal connectivity, existing zoning, and nature of the Site already being mostly historically developed and impacted, the potential for the loss of substantial buildable land as it relates to avoidance of stream and wetland features and associated SCPZ areas would place a significant financial hardship on the applicant and would not have made the Site a potential purchase and redevelopment option, likely resulting in the sale of the Site to a future purchaser who may encounter similar permitting constraints and business investment concerns that would prolong any development or investment opportunities from taking place on the Site in the future.

Numerous offsite and on-site alternatives were evaluated for this project. A property search was previously conducted prior to the purchase of the Buckeye Rail Yard Site for other available properties within the Central Ohio area that would potentially satisfy the overall project purpose and need. Those sites were ultimately ruled out for a variety of reasons including inadequate parcel size, availability of developable land, floodplain concerns, availability of access, incorrect zoning and ability for a zoning change/variance, and other site construction feasibility concerns, and have been included in the alternative analysis provided for the USACE Section 404 Individual Permit Application and Ohio EPA Section 401 Water Quality Certification Application, which are currently under review.

The selection of the Buckeye Rail Yard Site represented the ideal property for purchase and development for the intended project purpose and need of the surrounding area and supporting market. It is large and adequately sized, correctly zoned, does not possess significant floodplain concerns, centrally located with existing rail service, and has the capability to use the existing City workforce while maintaining those jobs locally for the area and region. Additionally, a substantial portion of the Site has already been historically developed for the previous rail yard operations. These aspects represented a significant opportunity for the applicant/permittee to purchase the Site and move forward with its associated redevelopment.

Section 3: Development Alternatives

3.1 No Impact Development Plan

The No Impact Development Plan would include development of a small southern portion of the Site, while completely avoiding any site development activities within jurisdictional waters of the United States and their associated SCPZ areas while still attempting fulfill the overall project purpose and need. As site development would take place outside of any delineated jurisdictional stream or wetland habitat or protected corridor areas, site development would generally be confined to the southern portion of the site only which is further discussed below in the development feasibility section.

3.1.1 Impact to Stream, SCPZ, Water Quality, Water Quantity

The No Impact Development Plan, which is depicted as the "No Impact Layout" in Appendix B, would avoid all impacts to on-site jurisdictional stream, wetland, and pond habitat and the associated SCPZ areas. The proposed development plan for this alternative would not significantly or adversely affect water quality or quantity on-site due to the avoidance of impacts to aquatic resources and their response SCPZ areas, nor would any stream restoration, riparian habitat improvements or plantings/reforestation be anticipated to take place on the Site, as under this alternative encroachment and associated impacts within the SCPZ area would be entirely avoided.

3.1.2 Social Benefits

As summarized in Table 1 in Appendix A, selection and implementation of the No Impact Development Plan would provide the following surrounding area/local community benefits, although not nearly as substantial as the anticipated benefits of the Minimal or Preferred Development Plan:

- Creation of approximately 20 permanent jobs associated with operation of the proposed logistics facilities including limited associated local, state, and federal payroll tax income.
- Creation of approximately 619 temporary construction jobs including local, state, and federal payroll tax income.
- Supplemental job creation and support for skilled trade positions such as laborers, operators, mason, ironworkers, carpenters, roofers, glaziers, plumbers, pipefitters, electricians, and landscapers.
- Surrounding area/local community retail sales and associated tax income related to permanent and temporary work on-site who will either relocate permanently or temporarily to the nearby area and spend portions of their incomed on housing, vehicle fuel, meals, retail purchases, etc.

It should be noted that the No Impact Development Plan is anticipated to result in the creation of approximately 1,000 few temporary jobs and 490 permanent jobs, while also resulting in a significant decrease in payroll and property tax revenue when compared with the Preferred Impact Development Plan alternative (refer to Table 1 in Appendix A).

3.1.3 Development Feasibility

Based on the required avoidance of any impacts to on-site jurisdictional stream, wetland, and pond habitat and the associated SCPZ areas (allowing for maintaining compliance with the SWDM), the No Impact

Development Plan would result in the placement of one (1) approximately 160k square foot warehouse located on the southern portion of the Site, adjacent to Trabue Road. In an effort to eliminate potential impact to on-site aquatic resources and their respective stream corridors, infrastructure updates and associated construction would not be feasible to allow for access to the central or northern portions of the Site. Existing roads that cross currently culverted portions of Stream 11 would require redesign and lowering in place to match required Site elevations, thus directly impacting a stream (Stream 11) and its associated SCPZ. Additionally, potential infrastructure tie-ins off of Walcutt Road are not feasible as they would again require culverting and access over on-site stream and SCPZ areas. The northern section of the Site would also not be allowed to tie into Roberts Road, as this portion of Roberts Road is a bridge, which cannot be tied into at this location. This combination of factors essentially cuts off multiple access points to public roads further limited the design feasibility of the site for the proposed use.

Avoiding impacts to any on-site stream habitat and SCPZ areas on-site would result in the loss of millions of square feet of potential under roof space. Within the reduction of square footage in the No Impact Development Plan that would result in no impact to the SCPZ, the financial impact resulting from the square footage loss of the majority of the site would make the Site and proposed project both feasibly not practicable from a design perspective and an economical perspective. As the Site was specifically selected and purchased for its size, centralized location, intermodal connectivity, existing zoning, and nature of the Site already being mostly historically developed and impacted, the potential for the loss of most buildable land as it relates to avoidance of stream and wetland features and associated SCPZ areas would place a significant financial hardship on the applicant and would not have made the Site a potential purchase and redevelopment option. In this scenario, this Site would remain undeveloped and fallow, furthering the eyesore and unused rail yard that occupies a heavily populated and trafficked area on the west side of Columbus; potentially leading to increased crime, unpermitted use, and degraded stream habitat and limiting water quality that has continued since the historical impacts of the streams (limited in-stream habitat, channelization, limited floodplain control, increased turbidity, lower overall water quality). Additionally, in this scenario the Site would be sold to another investor/developer and possibly developed for another use, however, this process may take years to locate another potential buyer who has an interest in the Site at a market price that would allow the current owner and applicant to regain their expenses. The future purchaser of the Site would also likely see the same development constraints as it relates to attempting to avoid stream/wetland and SCPZ area impacts, thus resulting in similar permitting constraints and business investment concerns that may prolong any development or investment opportunities from taking place on the Site.

In conclusion, the No Impact Development Plan would significantly limit the amount of developable and buildable land located on the Site. Since the Site is currently zoned for manufacturing, as is the majority of the surrounding properties, maintaining the same zoning and use of the Site is ideal and maintains what the Site was originally developed for. Industrial development sites are typically chosen to maximize the amount of buildable land and square footage under roof. Avoiding impacts to stream/wetland features and SCPZ areas on-site would result in the loss of millions of square feet of building footage. The overall financial loss in relation to the Site purchase price and anticipated investment return once constructed as proposed places an undue financial burden on the applicant based on the intended use and development of the Site and is therefore not considered a practicable alternative. Furthermore, the potential to sell the Site to another investor/developer is not considered practicable as a future purchaser of the Site would also likely see the same development constraints as it relates to avoidance of impacts to on-site stream/wetland and SCPZ features, thus resulting in similar permitting constraints and business investment concerns that may prolong any development or investment opportunities from taking place on the Site.

3.2 Minimal Impact Development Plan

The Minimal Impact Development Plan would include avoiding the majority of proposed impacts to jurisdictional waters of the United States and their associated SCPZ areas, while attempting to still fulfill the overall project purpose and need.

3.2.1 Impact to Stream, SCPZ, Water Quality, Water Quantity

The Minimal Impact Development Plan, which is depicted as the "Minimal Impact Layout" in Appendix C, would avoid the majority of impacts to on-site jurisdictional stream habitat and associated SCPZ areas, while proposed impacts for this alternative would still include 3,117 linear feet (255.00 lf piped) of jurisdictional stream habitat, 0.78 acre of jurisdictional wetland habitat, and 0.32 acre of jurisdictional pond habitat. Impacts to 4,295 linear feet of stream habitat would be avoided based on the Minimal Impact Development Plan. Due to the proposed impacts to over 0.5-acre of jurisdictional aquatic habitat on-site, the Minimal Impact Development Plan would still require a USACE Section 404 Individual Permit Application and Ohio EPA 401 Water Quality Certification Application as proposed impacts would exceed the threshold for coverage under a USACE Nationwide Permit. Culverting and/or stream relocation would be minimal with this alternative when compared to the Preferred Impact Development Plan, although still substantial.

The proposed Minimal Impact Development Plan would still likely adversely affect water quality or quantity on-site due to the proposed impact of approximately 3,000 linear feet to aquatic stream habitat and representative SCPZ areas. Stream restoration/relocation would still be required on-site to offset the proposed impacts to the noted 3,117 linear feet (255.00 lf piped) of stream habitat loss and associated impacts and encroachment within the SCPZ area. Planting/reforestation would also be required for the newly established SCPZ within the areas of restored/relocated stream habitat. Water quality may decrease for during the period while the stream restoration/relocation is conducted but would be controlled with best management practices and would eventually recover following the completion of the stream relocation and restoration activities, this avoiding significant long-term degradation. Additionally, proposed impacts to jurisdictional wetland habitat would be offset by the purchase of wetland mitigation credits at an established wetland mitigation bank that services the 8-digit HUC of the Site/project area.

3.2.2 Social Benefits

As summarized in Table 1 in Appendix B, selection and implementation of the Minimal Impact Development Plan would provide the following surrounding area/local community benefits, although not nearly as substantial as the anticipated benefits of the Preferred Development Plan:

- Creation of permanent jobs associated with operation of the proposed logistics facilities including associated local, state, and federal payroll tax income.
- Creation of temporary construction jobs including local, state, and federal payroll tax income.
- Supplemental job creation and support for skilled trade positions such as laborers, operators, mason, ironworkers, carpenters, roofers, glaziers, plumbers, pipefitters, electricians, and landscapers.
- Surrounding area/local community retail sales and associated tax income related to permanent and temporary work on-site who will either relocate permanently or temporarily to the nearby area and spend portions of their incomed on housing, vehicle fuel, meals, retail purchases, etc.

It should be noted that the Minimal Impact Development Plan is anticipated to result in the creation of approximately 200 fewer temporary jobs and 80 fewer permanent jobs when comparted to the Preferred Impact Development Plan, while also resulting in a significant decrease in payroll and property tax revenue (refer to Table 1 in Appendix A).

3.2.3 Development Feasibility

While smaller warehouse structures could potentially be developed and placed on the Site to avoid the majority of impacts within the existing SCPZ (thus maintaining compliance with the SWDM) for the Minimal Impact Development Plan, the resulting buildable land reduction would further influence buildable infrastructure on the site and associated under roof square footage. On a typical industrial development site, the industry standard you look to achieve is 35-40% minimum site coverage, and on a property as large as this Site, maximizing coverage is essential. Additionally, in today's industrial market the building sizes that are performing the strongest are the large (800k+ square feet) and mid-size (200k-500k) industrial structures/developments.

Avoiding impacts to the majority of the stream habitat and SCPZ on-site would result in the loss of nearly 700k square feet of building square footage, which is roughly an 15% decrease of buildable coverage across the ~280-acre Site. This potential design alternative would need to remove the currently proposed Building 2D (previously located north of Building 2C) from the plan entirely. This proposed plan also would require a reduction of square footage on the two largest proposed buildings on-site, 1D and 2A from over 900k square feet to 715k and 815k respectively, making those buildings much less attractive to prospective full building tenants. Typically, these building sizes are viewed as "tweeners" as potential tenants in the industry require 900k-1m square foot buildings or will settle for buildings in the 500k-700k square foot range. Beyond marketability, the financial impact resulting from the potential square footage loss equates to a multimillion-dollar net operating income lost once the project has stabilized. Additionally, based on the design changes to avoid further impacts to stream/wetland habitat onsite and associated SCPZ areas, the layout for buildings 2B and 2C would be required to be flipped with their entrances on the east side of the Site, opposite of the buildings to the south. From a traffic flow and safety perspective this may result in additional traffic congestion and safety issues through the park and access roads.

Assuming the current buildings proposed for the Minimal Impact Development Alternative (thus maintaining compliance with the SWDM) are valued at a conservate market cap rate of 4.75%, this alternative would result in a loss of value of approximately $94 million on the project. The loss of Building 2C and reduction of square footage of other onsite buildings either from their location over a jurisdictional feature and within the SCPZ or from their structural design feasibility in relation to their setback from a jurisdictional feature, the net operating income loss would increase to approximately $5.6 million with a ~$118-million loss in stabilized value, making the project economically not practicable.

As the Site was specifically selected and purchased for its size, centralized location, intermodal connectivity, existing zoning, and nature of the Site already being mostly historically developed and impacted, the potential for the loss of substantial buildable land as it relates to avoidance of stream and wetland features and associated SCPZ areas would place a significant financial hardship on the applicant and would not have made the Site a potential purchase and redevelopment option. In this scenario, this Site would remain undeveloped and fallow, furthering the eyesore and unused rail yard that occupies a heavily populated and trafficked area on the west side of Columbus; potentially leading to increased crime, unpermitted use, and degraded stream habitat and limiting water quality that has continued since the historical impacts of the streams (limited in-stream habitat, channelization, limited floodplain control, increased turbidity, lower overall water quality). Additionally, in this scenario the Site may be sold to another investor/developer and possibly developed for another use, however, this process may take years to locate another potential buyer who has an interest in the Site at a market price that would allow the current owner and applicant to regain their expenses. The future purchaser of the Site would also likely see the same development constraints as it relates to attempting to avoid most stream/wetland and SCPZ impacts, thus resulting in similar permitting constraints and business investment concerns that may prolong any development or investment opportunities from taking place on the Site.

In conclusion, the Minimal Impact Development Plan would still significantly limit the amount of developable and buildable land located on the Site. Since the Site is currently zoned for manufacturing, as is the majority of the surrounding properties, maintaining the same zoning and use of the Site is ideal and maintains what

the Site was originally developed for. Industrial development sites are typically chosen to maximize the amount of buildable land and square footage under roof.

3.3 Preferred Impact Development Plan

The Preferred Impact Development Plan would include impacting the entirety of waters of the United States located on the Site, while fulfilling the overall project purpose and need and maximizing developable land on the Site. Proposed impacts for this alternative would include 7,412 linear feet of jurisdictional stream habitat, 0.78 acre of jurisdictional wetland habitat, and 0.23 acre of jurisdictional pond habitat. Impacts to the noted features would take place in the form of filling/grading of wetland and pond habitat, and relocation/restoration of on-site stream and wetland habitat which would occur within the boundaries of the Site.

3.3.1 Impact to Stream, SCPZ, Water Quality, Water Quantity

Impacts to the on-site streams and jurisdictional aquatic resources, associated SCPZ, and discussion related to water quality and quantity was previously referenced. Please refer to Section 2.2.1. A site plan depicting the proposed layout of the Preferred Impact Development including the proposed stream relocation and associated SCPZ is provided in Appendix D. In addition, Stream Relocation and Reforestation Plans for the Preferred Impact Development Plan are presented in Appendices E and F.

3.3.2 Social Benefits

As summarized in Table 1 in Appendix A, selection and implementation of the Minimal Impact Development Plan would provide the following surrounding area/local community benefits, although not nearly as substantial as the anticipated benefits of the Preferred Development Plan:

- Creation of permanent jobs associated with operation of the proposed logistics facilities including associated local, state, and federal payroll tax income.
- Creation of temporary construction jobs including local, state, and federal payroll tax income.
- Supplemental job creation and support for skilled trade positions such as laborers, operators, mason, ironworkers, carpenters, roofers, glaziers, plumbers, pipefitters, electricians, and landscapers.
- Increased long-term overall water quality improvements once streams are relocated and restored with beneficial channel substrate, stream bank stabilization measures, and floodplain plantings.
- Surrounding area/local community retail sales and associated tax income related to permanent and temporary work on-site who will either relocate permanently or temporarily to the nearby area and spend portions of their incomed on housing, vehicle fuel, meals, retail purchases, etc.

The Preferred Impact Development Plan is anticipated to result in the creation of approximately 200 more temporary jobs and 80 more permanent jobs, while also resulting in extensive payroll and property tax revenues compared with the No Impact and Minimal Impact Development Plan alternatives (refer to Table 1 in Appendix B).

3.3.3 Development Feasibility

To summarize, the Preferred Impact Development Plan is the applicant's preferred Site design alternative and is has been further identified as the least environmental damaging most practicable alternative (LEDPA) in the associated project USACE Section 404 permit application and Ohio EPA Section 401 water quality certification application. All other alternative locations and associated on-site design alternatives located on the Buckeye Rail Yard Site were not considered practical or feasible for the reasons listed above. While the Preferred Impact Development Plan does propose to impact all jurisdictional waters of the United States located on the property, on-site wetland habitat is relatively low to moderate quality and is not considered notable or high quality. Proposed wetland impacts will be mitigated for through onsite wetland habitat creation at a 1:1 ratio per City of Columbus SWDM guidelines and further through the purchase of mitigation bank credits to meet USACE and Ohio EPA mitigation hierarchy guidelines. Additionally, proposed impacts to the 7,412.00 linear feet of jurisdictional stream habitat on-site and associated SCPZ is proposed to be mitigated for by relocating and restoring the existing stream channel, which is anticipated

to yield approximately 8,283.00 linear feet of open stream channel, resulting in a net gain of 1,126.00 linear feet of open channel and the associated SPCZ area to accompany those stream relocations (20.478 acres total throughout the Site). Additionally, approximately 1,189.00 linear feet of encapsulated/piped stream is also proposed to be added on-site in areas where open stream channel sinuosity are not feasible from a design and setback perspective (underground utilities, proximity to adjoining sites, road crossings, parking areas, entrances/exits, etc.). As approximately 255 linear feet of encapsulated/piped stream is currently existing on-site, the 1,189.00 linear feet of proposed encapsulated/piped stream does represent an increase of approximately 934.00 linear feet of proposed encapsulated/piped stream on-site. However, the proposed open channel stream portions represent a net gain of 1,126.00 linear feet of proposed open channel stream habitat (8,283.00 lf proposed versus 7,157.00 lf existing), so the additional encapsulated/piped stream portions are additional proposed lengths generally not included in the 1:1 replacement ratio of existing versus proposed open channel stream habitat. Relocated and restored SCPZ acreage will result in approximately 24.19 acres total (compared to 20.332 acres existing).

This alternative fulfills the overall project purpose and need and for allowing a substantial amount of buildable and developable land on the Site, while providing for a method to minimize environmental impacts and providing suitable mitigation for those proposed impacts on-site. The driver of this alternative being identified and selected as the Preferred Impact Development Plan is it fulfills the overall project purpose and need, while also satisfying the City of Columbus zoning variance request requirements regarding encroachment into a Stream Corridor Protection Zone. This alternative avoids encapsulation of the current 7,412 linear feet of stream on-site as initially proposed in the preliminary planning stages of the project and further allows for on-site stream relocation/restoration, wetland creation, and associated water quality and habitat improvements while actually increasing linear stream footage on-site and SCPZ acreage.

While associated proposed development stormwater basins adjacent to relocated SCPZ areas have been noted as a potential stability concern, basins have been designed and provided with sufficient distance to mitigate stability concerns. Per private site development plans, measures are being provided to mitigate instability at points of basin discharge into on-site streams. Please refer to the CC19588 Stormwater Design Manual for analysis and design of private site discharge into proposed relocated on-site stream corridors.

Section 4: Demonstration of Adequate Mitigation

4.1 Impacts to SCPZ

The Preferred Impact Development Plan will result in impacts to approximately 20.332 acres of existing SCPZ on-site associated within the five (5) streams, two (2) wetlands, and one (1) pond located on the Site. As proposed mitigation for proposed encroachment and associated impacts to the SCPZ, approximately 24.19 acres of SCPZ will be established within the riparian areas of the relocated/restored stream channel areas and wetland areas. This represents an increase of 3.858 acre, thus maintaining at least a 1:1 mitigation replacement ratio. The SCPZ is proposed to be established over the piped/encapsulated stream portions on-site as well, maintaining the SCPZ throughout the Site to the greatest extent practical. Below is the breakdown of the existing SCPZ widths and associated proposed SCPZ widths for each feature. Per the plan notes, Stream corridor protection zone (SCPZ) widths were enlarged and adjusted at points of stream confluences to account for combined flows, yielding the overall indicated 20.332 acres of current SCPZ on-site and 24.19 acres of proposed SCPZ on-site.

Stream 9: 320.00 linear feet, 119' wide existing SCPZ (119' wide SCPZ proposed)
Stream 10: 2,552.00 linear feet, 104' wide existing SCPZ (104' wide SCPZ proposed)
Stream 11: 3,921.00 linear feet, 109' wide existing SCPZ (109' wide SCPZ proposed)
Stream 12: 369.00 linear feet, 93' wide existing SCPZ (93' wide SCPZ proposed)
Stream 13: 250.00 linear feet, 85' wide existing SCPZ (85' wide SCPZ proposed)
Wetland 7: 0.49 acre, 0.49 acre existing SCPZ (0.49 acre proposed SCPZ)
Wetland 8: 0.29 acre, 0.29 acre existing SCPZ (0.29 acre proposed SCPZ)
Pond 1: 0.23 acre, 0.23 acre existing SCPZ (N/A, encompassed in proposed stream SCPZ)

In compliance with the City of Columbus Tree Protection and Mitigation Policy, trees that are currently located within the existing SCPZ areas which are proposed for removal will be replaced within the newly established SCPZ at a minimum of 1:1 ratio per the City's tree replacement guidance. A Stream Reforestation Plan has been developed for restoration of the SCPZ area and is provided in Appendix F. The plan includes a survey of the existing trees currently located in the SCPZ of the on-site stream areas, anticipated replacement ratios, applicable tree sizes (DBH, diameter at breast height), proposed tree species to be planted, and proposed locations for the newly planted trees within the new, relocated SCPZ areas. The entire existing SCPZ area was surveyed for existing trees and will be adequately replaced to meet the minimum required tree planting density of 136 trees per acre within the proposed SCPZ area per City guidance. Additional trees and woody species will be planted within the forested wetland habitat area (0.57 acre) to meet the USACE and Ohio EPA performance criteria of 400 native, live, and health woody plants per acre (of which at least 200 are tree species) present at the end of the proposed monitoring period.

Kimley-Horn has prepared a vegetation planting plan for the proposed stream SCPZ, as well as the created wetland areas which will consist of native trees/shrubs and associated vegetation within the newly relocated SCPZ and wetlands. Due to the substantial amount of invasive/non-native species coverage within the current SCPZ, such as honeysuckle (*Lonicera spp.),* giant reed (*Typha angustifolia*) and cattail (*Typha spp.*), the reforestation and replanting of the proposed relocated SCPZ is anticipated to improve the overall woody and non-woody plant species diversity and abundance within the Site. The Stream Reforestation Plan and Wetland Planting Plan are provided in Appendix F.

A conservation easement will be placed on the SCPZ of the relocated streams and created wetland areas that name the City of Columbus as the Grantee. The conservation easement will be placed on the entire 24.19 acres of newly established SCPZ, with the exception of any proposed sewer, storm sewer, utility, or other applicable easements.

The conservation easement will include as attachments, a metes and bounds (survey) description of the protected mitigation area (SPCZ) and survey maps depicting the boundaries of all protected mitigation areas. Additionally, applicable SCPZ signage will be placed within visual distance of each other along the

edge of the conservation/SCPZ area per SWDM guidance (Section 1.3.6). Other easements that cross the SCPZ such as sanitary, water, and access are anticipated to be exempt from the conservation easement agreement.

4.2 Impact Directly to Streams & Wetlands

The Preferred Impact Development Plan will result in approximately 7,412 linear feet of jurisdictional intermittent and perennial stream habitat impact and 0.78 acre of jurisdictional forested and emergent wetland habitat on-site. As compensation for the proposed on-site stream impacts, the existing streams are anticipated to be relocated, which will yield approximately 8,283.00 linear feet of open stream channel and 1,189.00 linear feet of encapsulated (piped) stream channel, resulting in a total of 9,472.00 linear feet of relocated on-site stream channel. This results in a net gain of approximately 1,126.00 linear feet of open stream channel. The relocated stream portions will be designed using natural stream design principals and the SCPZ will be re-established along the relocated stream segments to compensate for proposed impacts to the existing SCPZ. The newly established SCPZ will result in approximately 24.19 acres total, yielding a net gain of 3.858 acres over the existing SCPZ acreage (20.332 acres). As the existing on-site stream channels generally exhibit modified warm water habitat characteristics due to historical impacts resulting in channelization, limited stream channel substrate, limited flow and stream channel habitat (no defined riffle/run or pool habitat) and a limited stream riparian corridor, the relocation and restoration of streams on-site is anticipated to result in significant habitat improvements which will aid and benefit the surrounding and downstream area watershed by improving water quality and habitat. These improvements will increase the diversity of habitat for aquatic macroinvertebrates, fish, and amphibians which is generally lacking in the existing stream channels.

Based on the September 2012, Guidance Document for Applying for a Variance from the Stormwater Drainage Manual, available on the City of Columbus Stormwater Variance Requests' website, the Type III Stream Protection Variances Section III, Part B, indicates that "*if the preferred alternative has a direct impact on the stream, then the Applicant must demonstrate adequate mitigation by demonstrating that the stream health and functionality will not be impaired. Applicant must do so by comparing the estimated QHEI/HHEI of the stream with cull compliance with the Manual. If the QHEI/HHEI of the preferred alternative meets or exceeds the full compliance QHEI/HHEI, then the Applicant has demonstrated adequate mitigation."* Additional required information is also indicated in this section. While all streams on-site encompassed a drainage area below one square mile, Stream 9, Stream 10 and Stream 13 were the only streams that exhibited a maximum pool depth of less than 40 centimeters, indicating the use of Ohio EPA's *Field Methods for Evaluating Headwater Streams in Ohio (HHEI)*. While Stream 11 and 12 exhibited drainage areas below one square mile, the other two (2) streams also exhibited a depth of over 40 centimeters, thus requiring the use of the *Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI)*. Applicable HHEI and QHEI scores were calculated based on the representative stream habitat characteristics on-site. The Stream 9, Stream 10, and Stream 13 HHEI reaches were approximately a 200' long reach located within a representative segment of the on-site stream portions, while for Stream 11, and 12, a reach length of approximately 100 meters (if practical) was used to ensure adequate habitat variation was assessed. Additionally, locations of the HHEI and QHEI areas were selected in an effort to minimize historically disturbed areas and/or heavily impacted areas so that in-channel habitat could be adequately recorded to the greatest extent possible.

The Stream 9 HHEI reach was located approximately in the central portion of the stream located between the west adjoining storm water basin, which feeds Stream 9, and the eastern portion of the stream where Stream 9 flows into Stream 10, and they both proceed to flow east (downstream) under a culvert that carries flow east under the rail yard area. The HHEI score for Steam 9 was calculated to be 60, while the HHEI score for Stream 10 was calculated to be 59. The Stream 13 HHEI reach was also located approximately in the central portion of the stream between the west adjoining property line (fenced) and the eastern confluence of Stream 13 where is flows into Stream 11. The HHEI score for Stream 13 was calculated to

be 64. Based on the HHEI flowchart in the Ohio EPA manual, Stream 9, Stream 10, and Stream 13 represent Modified Class II Primary Headwater Habitat (intermittent).

The Stream 11 and 12 QHEI locations were located in representative habitat areas of the respective streams, which attempted to minimize the sampling/assessment of areas that were historically disturbed or modified. Due to the historical impacts across the entirety of the site, this proved to be difficult although the habitat sampling effort took this into account to the greatest extent practical. The QHEI scores for both Stream 11 and Stream 12 were calculated to be 32.5, which represents Modified Warmwater Habitat.

Applicable existing stream habitat assessment HHEI and QHEI datasheets are provided in Appendix H, while existing pebble count datasheets are provided in Appendix I. Anticipated stream habitat assessment datasheets for the applicable streams once restored are provided in Appendix J.

As previously indicated, prior to the development of the Site for the rail yard, the majority of the Site consisted of active agricultural land with extremely limited or no riparian buffers adjacent to the on-site streams. Additionally, although it cannot be determined based on historical aerial/satellite image review, streams on-site were also likely somewhat modified and/or channelized as part of routine agricultural practices. Following development of the Site with the rail yard, streams are depicted as having been re-routed around the rail yard through newly excavated channel/ditches that either conveyed east-flowing hydrology north or south around the central rail yard area. No stream sinuosity, in-stream channel habitat, or stream bank or riparian vegetation appeared to have been created or restored at the time of the respective stream relocations. The assumed intent of the historical stream re-routing was to convey hydrology away from the rail yard Site as quickly and efficiently as possible, with little regard to water quality or associated stream habitat.

The existing streams onsite do not currently have an Ohio EPA designated aquatic life use. Overall, the existing slope of all onsite streams is approximately 0.5-0.04%, which is likely a result of the historical impacts to the onsite stream habitat and significant stream relocation. Stream entrenchment and floodplain disconnection appear to have negatively influenced fine sediment scouring and D84 particle size, as indicated in Table 2 below.

Due to the historical impacts and re-routing of onsite stream habitat, some of the parameters listed in Table 2 below may be slightly skewed and do not meet any Rosgen Stream Classification type as described. Based on the evaluation and assessment of onsite stream habitat, all five (5) streams onsite likely most closely align as a E6b stream, although all streams currently exhibit heavy historical modification. The existing and proposed 100-year floodplains are presented on the provided stream relocation plans in Appendix E. Proposed stream channels within the relocation and restoration areas are anticipated to exhibit a relatively stable C type stream channel morphology exhibiting a width to depth ratio greater than 12, an entrenchment ration greater than 2.2, a slope between 0.1% and 1.3%, and a sinuosity greater than 1.2. The D84 substrate and riffle habitat is anticipated to also be vastly improved once the proposed stream relocation and restoration has been completed and the stream has had ample time to return to normal flow conditions and seasonal patterns.

Table 2: Stream Summary Data					
	Stream 9	**Stream 10**	**Stream 11**	**Stream 12**	**Stream 13**
OEPA Aquatic Life Use Desig	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
OEPA HHEI/QHEI Score	60 (HHEI)	59 (HHEI)	32.5 (QHEI)	32.5 (QHEI)	64 (HHEI)
Stream Gradient (%)	0.52	0.04	0.29	0.43	0.11
Average Bank Full Width	16'	20'10"	21'2"	1811”	13’3”
Width to Depth Ratio	6.40	5.26	5.86	6.06	4.83
Entrenchment Ratio	2.38	3.50	3.40	2.88	2.49
Substrate D84 mm	<0.06 (silt)	12.5	6	<0.06 (silt)	10
Sinuosity	1.06	1.16	0.95	1.00	1.00
Rosgen Stream Type	E6b	E6b	E6b	E6b	E6b
Drainage Area (sq mi)	0.57	0.40	0.45	0.30	0.24

Per the previously completed wetland delineation report, Wetland 7 is located within the wooded northwest portion of the Site. Wetland 7 appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Based on visual observation, Wetland 7 appears to be regularly inundated/saturated and is generally dominated by native woody species. Wetland 8 is also located within the wooded northwest portion of the Site. Wetland 8 appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Based on visual observation, Wetland 8 appears to be seasonally saturated and is generally dominated by invasive Reed Canary Grass (*Phragmites australis*).

Wetland habitat was classified using Ohio EPA’s Ohio Rapid Assessment Method (ORAM) for Wetlands Version 5.0. The ORAM categorizes wetlands and assigns them a score based on a specific quantitative rating system. This score relates to the quality of the wetland, Category 1 (low quality), Category 2 (moderate quality), or Category 3 (high quality). The wetlands identified within the Site were classified as Category 2 and are therefore considered to represent moderate quality habitat.

Table 3. Wetland Summary Table				
Stream Resource	**Watershed/HUC**	**Vegetative Class[1]**	**ORAM Score/Category[2]**	**Size On-site (acres)**
Wetland 7	Scioto River/05060001	Palustrine Forested (PFO)	49 / Category 2	0.49
Wetland 8	Scioto River/05060001	Palustrine Emergent (PEM)	38 / Category 2	0.29

As previously indicated, on-site wetland creation is currently proposed to offset impacts to the 0.78 acre of jurisdictional wetland habitat by creating 0.82 of wetland habitat within the Site, maintaining a 1:1 mitigation ratio. The existing 0.49 acre of jurisdictional forested wetlands and 0.29 acre of emergent wetlands currently proposed for impact will be mitigated for by the creation of the same wetland habitat types and approximate size at a new location within the Site, adjacent to the currently delineated Stream 12 feature. Based on preliminary coordination with the USACE and Ohio EPA, no additional setback requirements are currently anticipated.

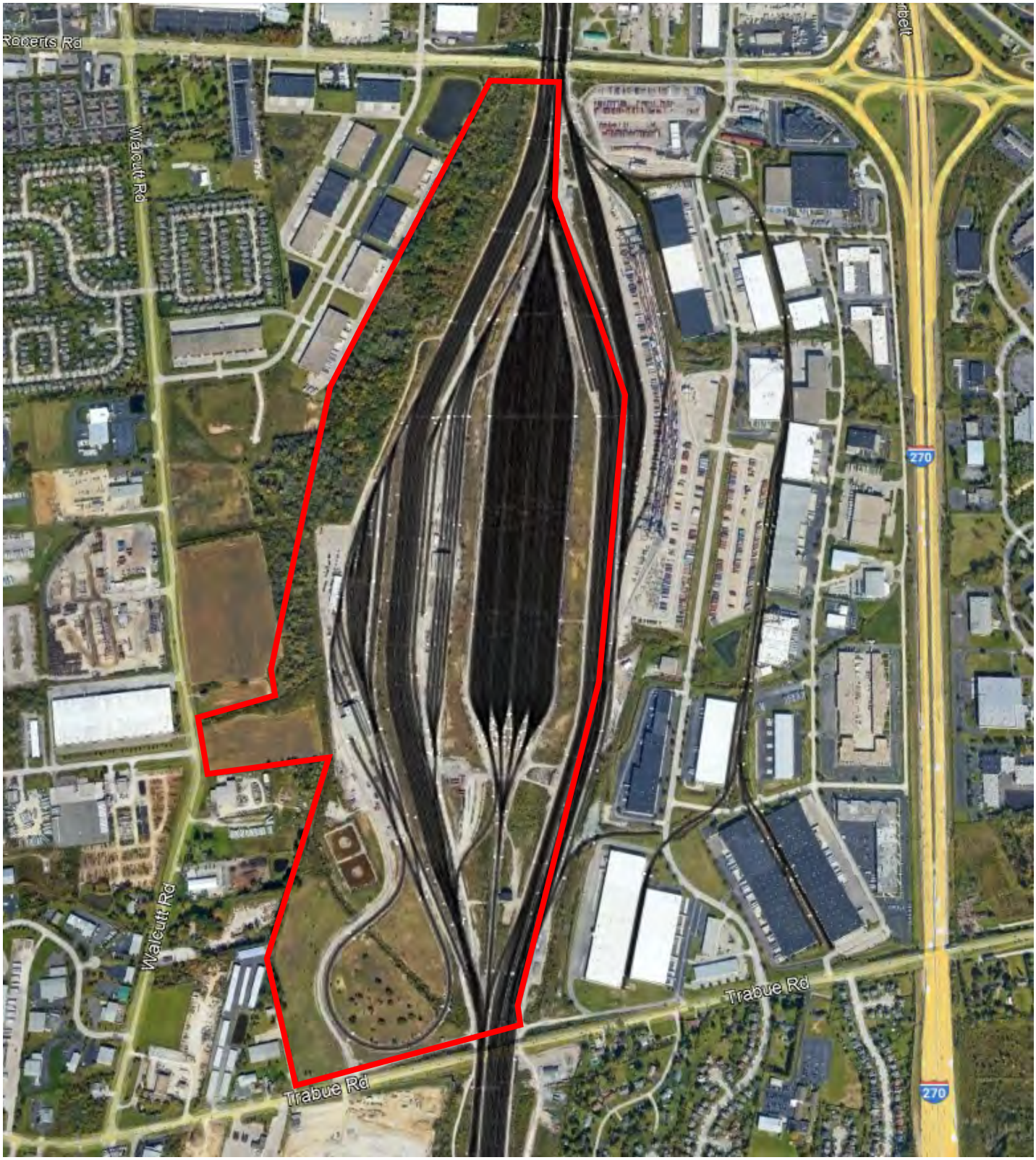
As part of the USACE and Ohio EPA Section 4041/401 permitting process, Kimley-Horn has drafted a Stream & Wetland Mitigation Plan for review and approval by the noted agencies to ensure that the proposed on-site stream and wetland relocation/restoration and creation of aquatic resources meets applicable agency monitoring and performance criteria set forth in their respective regulatory guidance. The Stream & Wetland Mitigation Plan has been prepared in accordance with the applicable requirements of Department of the Army, Corps of Engineers (USACE), Compensatory Mitigation for Losses of Aquatic Resources 33 CFR 332.4(c)(2)-(14), as well as the Guidelines for Stream Mitigation Banking and In-Lieu Fee Programs in Ohio (V 1.1), developed by the Ohio Interagency Review Team (March 2016). Kimley-Horn is further revising the proposed Stream and Wetland Mitigation Plan to address additional City of Columbus requirements and recent comments. A copy can be forwarded upon request once complete. The Wetland Planting Plan is provided in Appendix F.

Section 5: Conclusion/Summary

5.1 Closing

The proposed Preferred Impact Development Plan will allow the applicant to fulfill the intended purpose and need of the project and creation of substantial warehouse logistics space within central Ohio that is intended to fulfill the local and regional demand shortages and gaps that have arisen since the beginning of the covid-19 pandemic and associated product shortages/availability. The proposed site would allow for substantial supply and last-mile access to meet continued growth trends, while relying on the diverse and skilled local workforce of central Ohio. In addition, the proposed relocation, restoration, and creation of on-site jurisdictional stream and wetland habitat represents a significant opportunity to restore the noted aquatic features to historical pre-impact conditions (prior to rail yard development) that is intended to improve overall water quality and associated stream habitat on-site and within the surrounding area watershed.

Figures



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7965 North High Street
Suite 200
Columbus, Ohio 43235

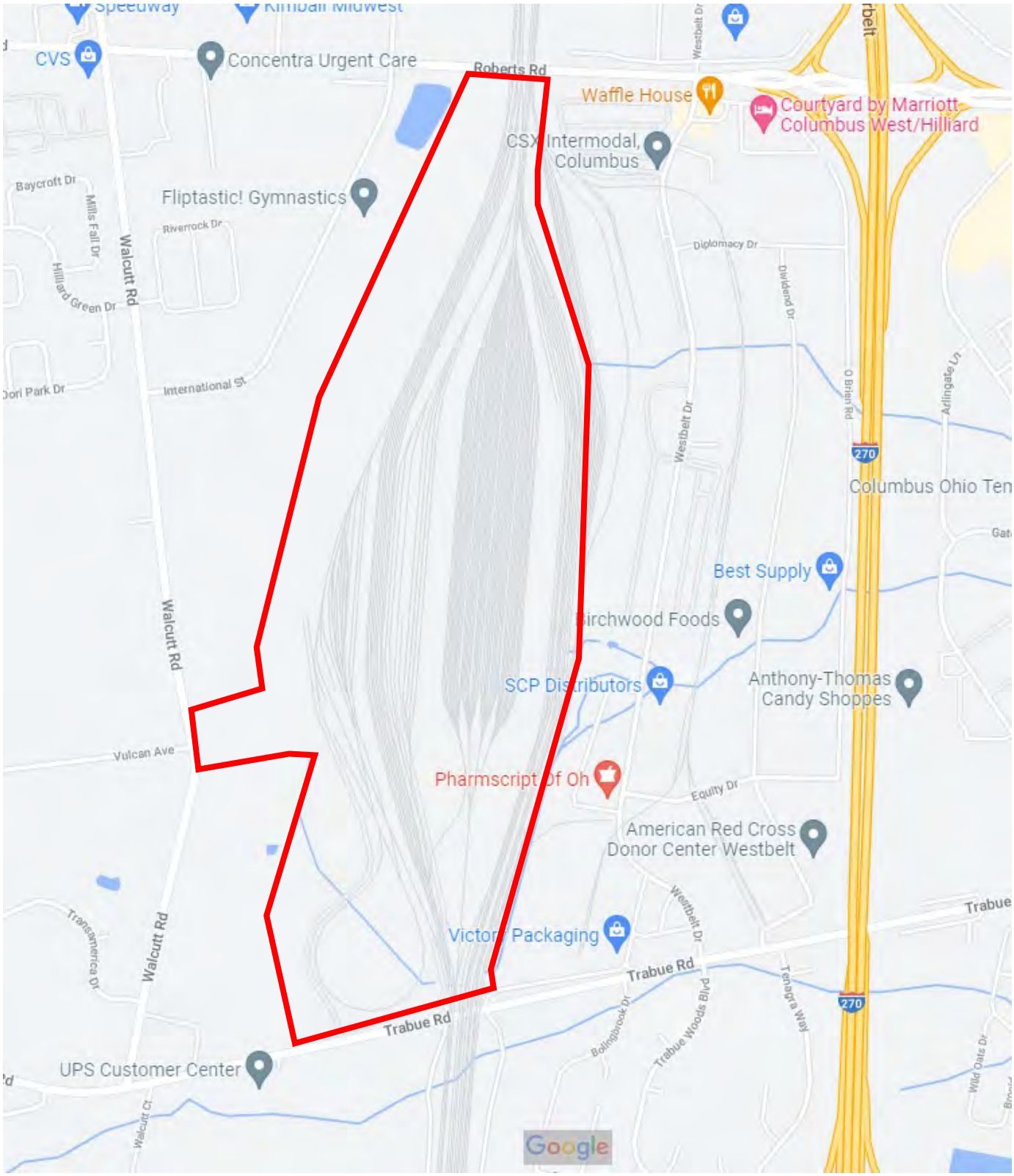
Source: Google Earth©, 2021

Project No: 190118003

Date: November 2021

Scale: 1" = 1,000'

Figure 1A: Site Vicinity Map – Aerial
Proposed Buckeye Yard Redevelopment
Trabue Road & Roberts Road
Columbus, Franklin County, OH 43228



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7965 North High Street
Suite 200
Columbus, Ohio 43235

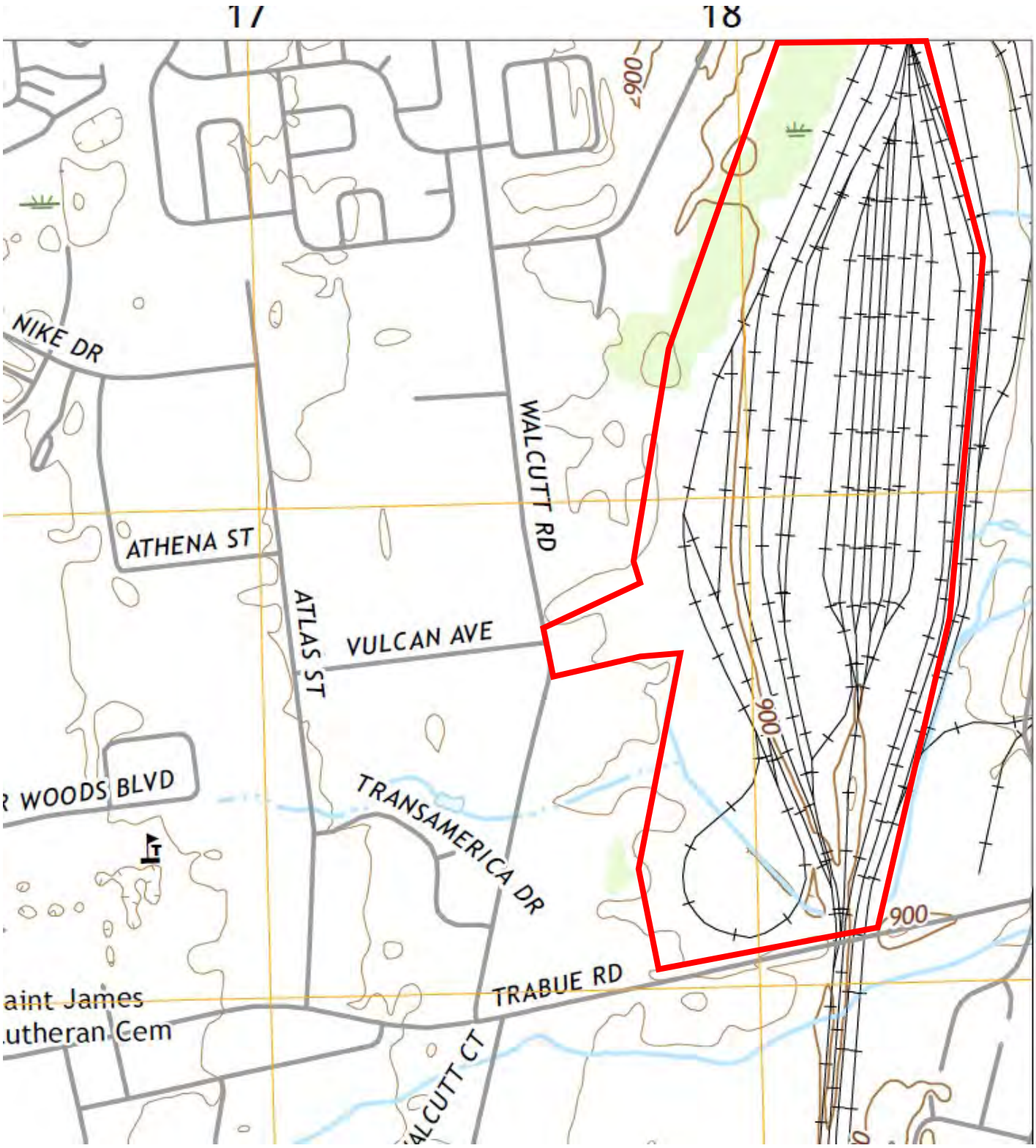
Source: Google Map Data©, 2021

Project No: 190118003

Date: November 2021

Scale: 1" = 1,000'

Figure 2B: Site Vicinity Map – Street
Proposed Buckeye Yard Redevelopment
Trabue Road & Roberts Road
Columbus, Franklin County, OH 43228



Kimley»Horn

7965 North High Street
Suite 200
Columbus, Ohio 43235

Source: USGS Topo Map, 7.5-Minute Series, Galloway, OH Quadrangle, 2019

Project No: 190118003	Scale: 1 :24,000
Date: November 2021	

Figure 1C: Site Vicinity Map – Topo
Proposed Buckeye Yard Redevelopment
Trabue Road & Roberts Road
Columbus, Franklin County, OH 43228

The data on this map was originally compiled at 1"=100' based on the Ohio State Plane South Coordinate System,North American Datum 1983 with 2' contours based on the North American Vertical Datum 1988 (when displayed).

Franklin County Auditor's Office

Auditor

Michael Stinziano

Map Produced November 16, 2021

Planimetric Legend

Source: 2018 Aerial Photography

- Edge of Pavement
- Roadway Centerlines
- Railroad Centerlines
- Building Footprints
- Building Under Construction
- Creeks, Streams, Ditches
- Rivers & Ponds

Topographic Legend

Source: OSIP - 2019 LiDAR Collection

- Spot Elevation
- Index Contour
- Intermediate Contour

Appraisal Legend

Source: Franklin County Auditor & Engineer

- XXX-XXXXXX Parcel IDs
- 100 Parcel Dimensions
- 100 Lot Numbers
- 123 Main St Site Address
- Parcel Boundary
- Subdivision Boundary
- Condominium Boundary
- County Boundary
- City or Village Boundary
- Tax District Boundary
- School District Boundary
- Zip Code Boundary

This map is prepared for the real property inventory within the county. It is compiled from record deeds, survey plats, and other public records and data. Users of this map are notified that the public primary information sources should be considered for verification of the information contained on this map. The county and the mapping companies assume no legal responsibility for the information contained on this map. Please notify the Franklin County Auditor's GIS Department of any discrepancies.

MICHAEL STINZIANO
Franklin County Auditor

Appendix A: Social and Economic Justification for Stream Relocation Table (Table 1)

Table 1. Social and Economic Justification For Proposed Stream Relocation/Restoration			
Item	**No Impact Design**	**Minimal Design**	**Preferred Design**
	Construct only Building 1A	Lose building 2D. Size decrease on 4 of the buildings.	Stream Relocation as currently proposed
Square Foot and Space Use	160,560 (warehouse distribution)	3,511,606 (warehouse distribution)	4,155,392 (warehouse distribution)
New Permanent Jobs	20	430	510
New Temporary Jobs	100	1,400	1,600
Estimated Permanent Payroll	$619,000	$13,531,000	$16,011,000
Est. Temporary Payroll	$2,800,000	$39,400,000	$45,000,000
Estimated Permanent Payroll Taxes/Year	$136,180	$2,976,820	$3,522,420
Est. Temporary Payroll Taxes/Year	$70,000	$985,000	$1,125,000
Property Taxes Generated Per Year	$381,821	$6,172,000	$7,449,000

Appendix B: No Impact Alternative Development Plan

UTILITY LEGEND

- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY
- UNUSABLE AREA

SITE DATA TABLE

TOTAL SITE ACERAGE	20.12 AC.
BUILDING AREA	3.69 AC
TOTAL EX STREAM	7,157 LF (±255 LF PIPED) = 7,412 LF TOT.
IMPACTED STREAM	0.00 LF
TOTAL WETLAND AREA	0.78 AC.
IMPACTED WETLAND AREA	0.00 AC.
TOTAL SCPZ AREA	20.332 AC.
IMPACTED SCPZ AREA	0.00 AC.

EXISTING STREAM TABLE

STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
9	0.57	119	±320
10	0.40	104	±2552
11	0.45	109	±3921
12	0.30	93	±369
13	0.24	85	±250

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

NORTH

GRAPHIC SCALE IN FEET
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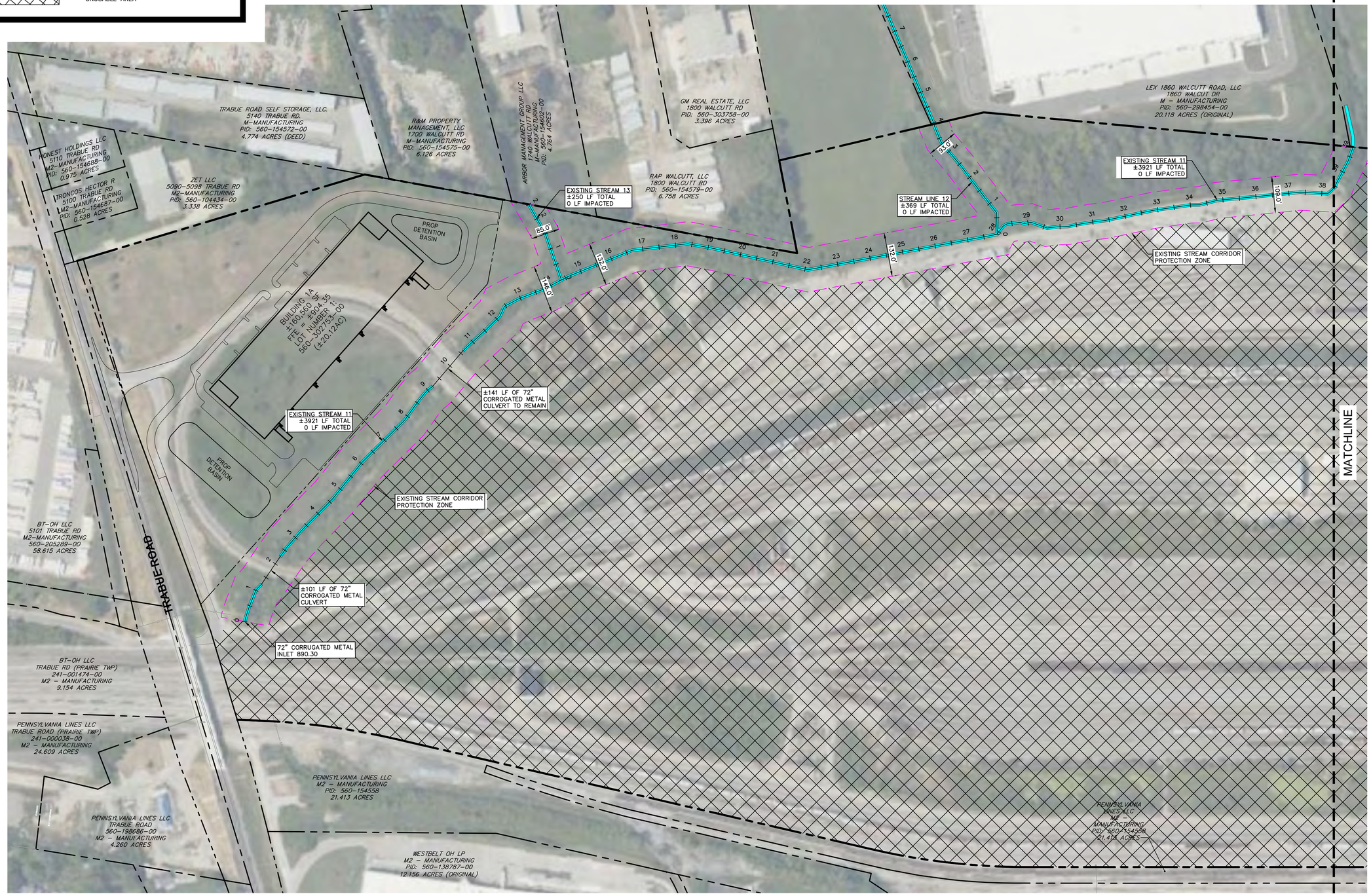

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DRAWN BY: GJR
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NO IMPACT LAYOUT

BUCKEYE YARD
COLUMBUS, OHIO

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
1 OF 2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\Exhibits\AllSite\Exhibits\AllSite-NoImpactPlan.dwg 1 OVERALL SITE LAYOUT Oct 17, 2022 1:19pm by: Gavin.Rivera
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UTILITY LEGEND

- EXISTING STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY
- UNUSABLE AREA

SITE DATA TABLE	
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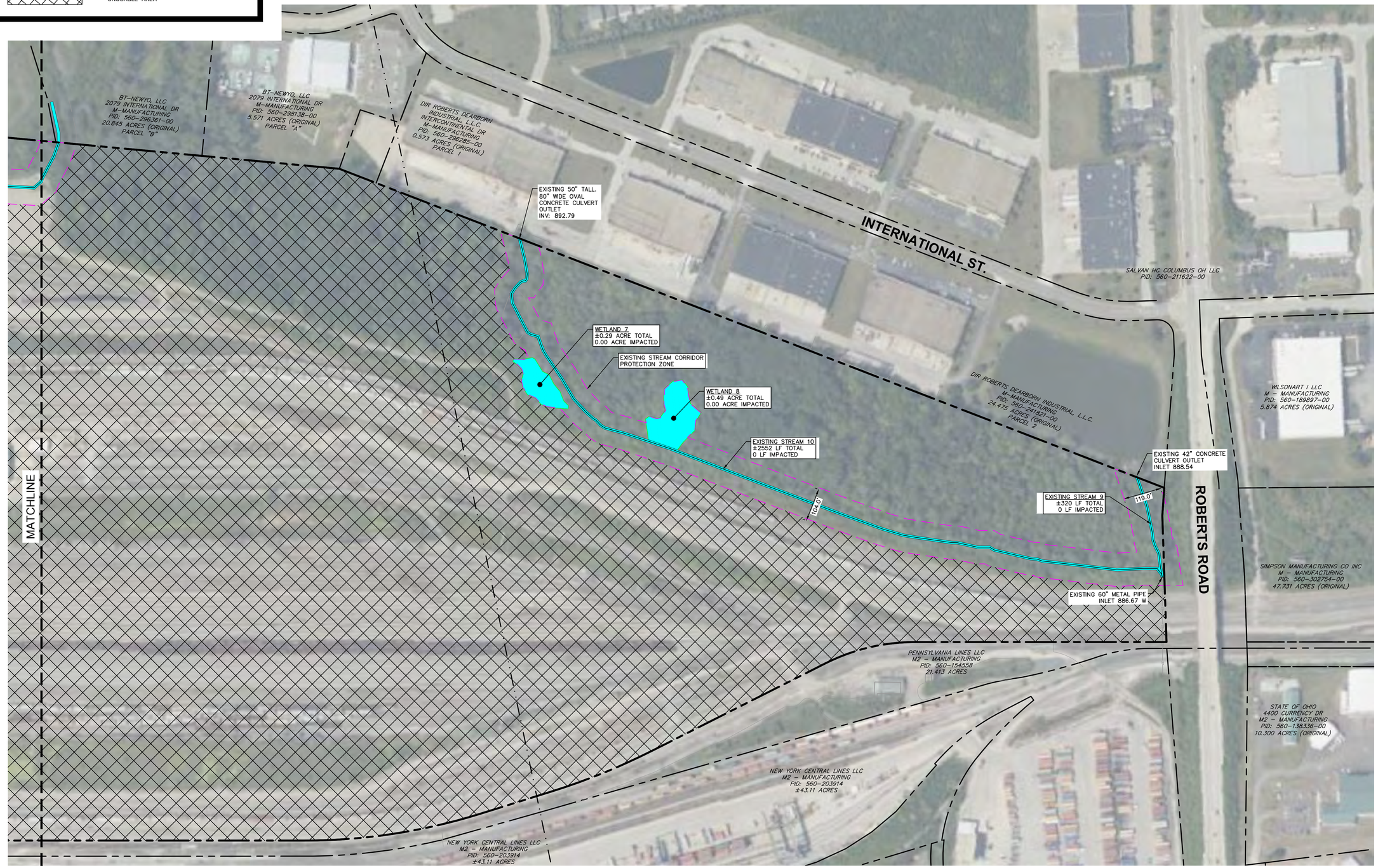

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COLUMBUS, OHIO

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SHEET NUMBER
1 OF 2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\Exhibits\AllSite\Exhibits\AllSite-NoImpactPlan.dwg 2 OVERALL SITE LAYOUT Oct 17, 2022 1:19pm by: Gavin.Rivera
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Appendix C: Minimal Impact Alternative Development Plan

UTILITY LEGEND

- EXISTING STREAM CORRIDOR PROTECTION ZONE
- PROPOSED STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM TO BE IMPACTED
- EXISTING STREAM TO REMAIN
- PROPOSED STORM PIPE
- PROPOSED STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY

SITE DATA TABLE

TOTAL SITE ACERAGE	207.01 AC.
BUILDING AREA	80.62 AC
TOTAL EX STREAM	7,157 LF (±255 LF PIPED) = 7,412 LF TOT.
IMPACTED STREAM	±3117 LF (±255 LF PIPED) = 3,372 LF TOT.
PROPOSED STREAM	±5810.5 LF (±779 LF PIPED) = 6589.5 LF TOT.
TOTAL WETLAND AREA	0.78 AC.
IMPACTED WETLAND AREA	0.78 AC.
PROPOSED WETLAND AREA	0.96 AC.
TOTAL SCPZ AREA	20.332 AC.
IMPACTED SCPZ AREA	12.058 AC.

PROPOSED STREAM TABLE

STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
A-11.2 (EX 11 + EX 12)	0.75	132	1067
A-13 (EX 13)	0.24	85	85
A-11.3 (EX 11 + EX 12 + EX 13)	0.99	146	2,531
B-10.1 (EX 10)	0.40	104	1807.5

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS. STREAM LENGTHS DO NOT INCLUDE PIPED QUANTITIES.

PROPOSED STREAM CORRIDOR PROTECTION AREA (±15.44 AC.)

NORTH

GRAPHIC SCALE IN FEET
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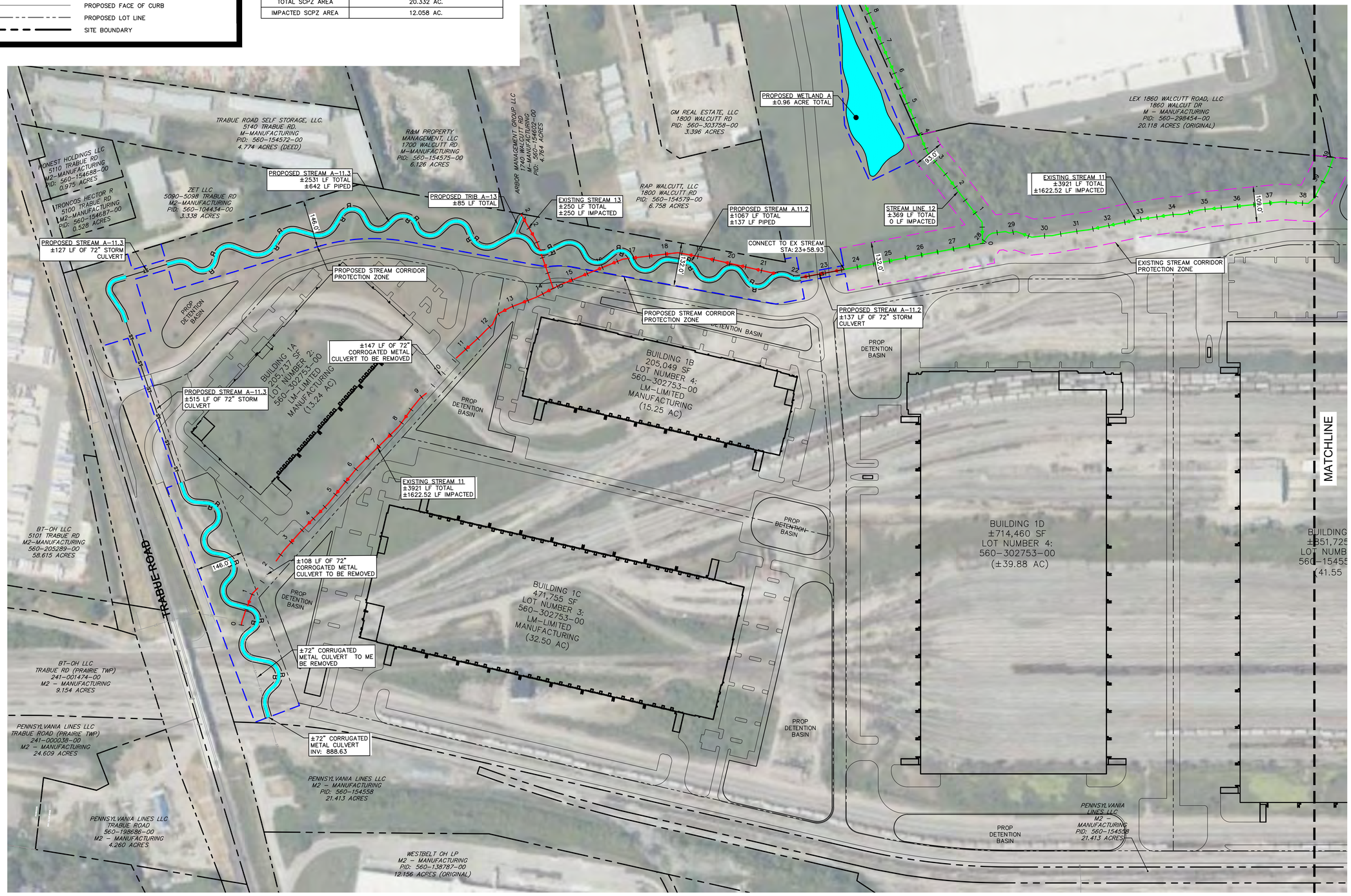

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DRAWN BY: GJR
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MINIMAL IMPACT LAYOUT

BUCKEYE YARD
COLUMBUS, OHIO

ORIGINAL ISSUE: 10/17/2022
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UTILITY LEGEND

- EXISTING STREAM CORRIDOR PROTECTION ZONE
- PROPOSED STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM TO BE IMPACTED
- EXISTING STREAM TO REMAIN
- PROPOSED STORM PIPE
- PROPOSED STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY

SITE DATA TABLE	
TOTAL SITE ACERAGE	207.01 AC.
BUILDING AREA	80.62 AC
TOTAL EX STREAM	7,157 LF (±255 LF PIPED) = 7,412 LF TOT.
IMPACTED STREAM	±3117 LF (±255 LF PIPED) = 3,372 LF TOT.
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PROPOSED WETLAND AREA	0.96 AC.
TOTAL SCPZ AREA	20.332 AC.
IMPACTED SCPZ AREA	12.058 AC.

PROPOSED STREAM TABLE			
STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
A-11.2 (EX 11 + EX 12)	0.75	132	1067
A-13 (EX 13)	0.24	85	85
A-11.3 (EX 11 + EX 12 + EX 13)	0.99	146	2,531
B-10.1 (EX 10)	0.40	104	1807.5

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS. STREAM LENGTHS DO NOT INCLUDE PIPED QUANTITIES.

PROPOSED STREAM CORRIDOR PROTECTION AREA (±15.44 AC.)

NORTH

GRAPHIC SCALE IN FEET
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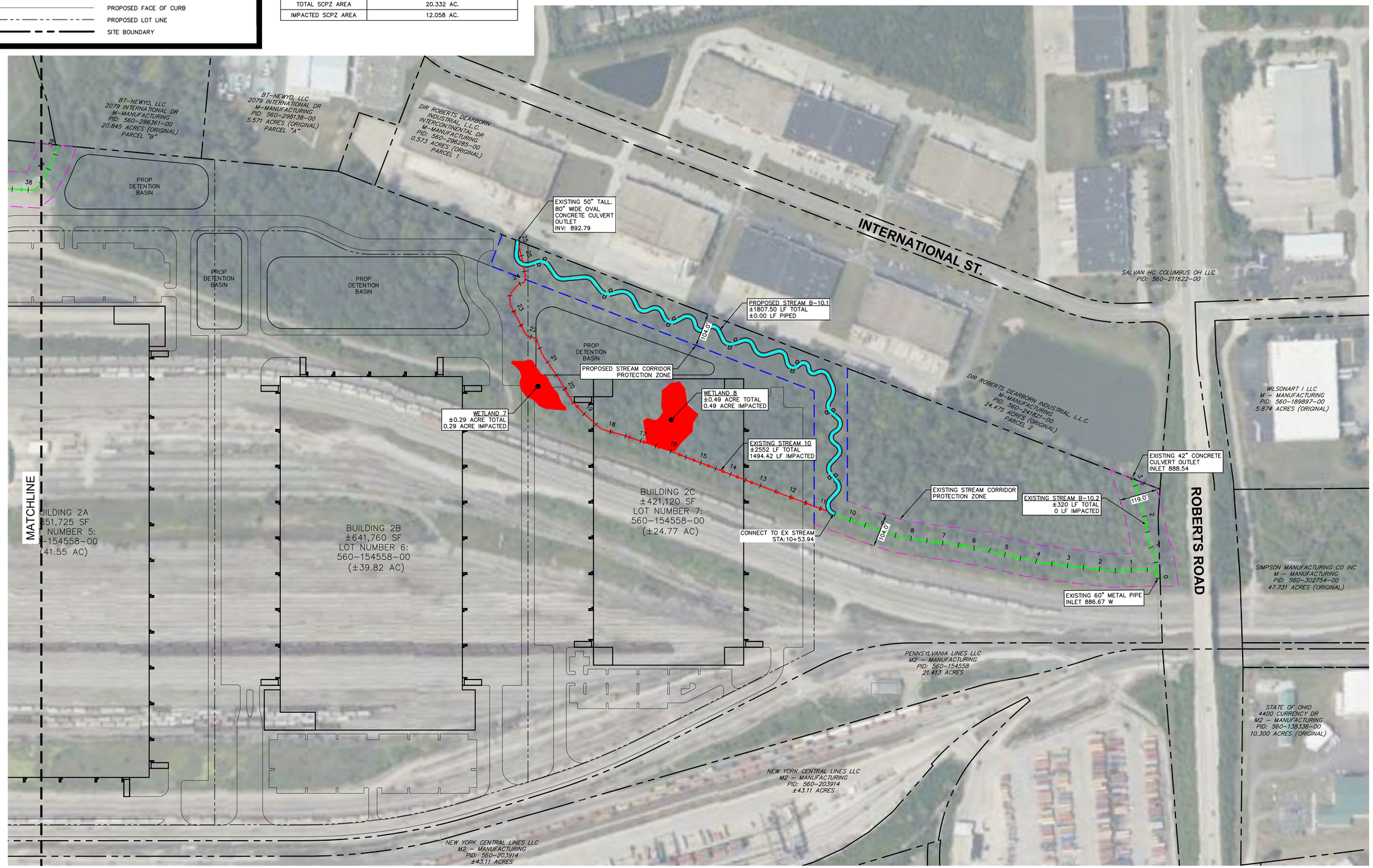

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DRAWN BY: GJR
CHECKED BY: JMM

MINIMAL IMPACT LAYOUT

BUCKEYE YARD
COLUMBUS, OHIO

ORIGINAL ISSUE: 10/17/2022
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\Exhibits\AllSiteExhibits\AllSite-MedImpactPlan.dwg 2 OVERALL SITE LAYOUT Oct 17, 2022 1:12pm by: Gavin.Rivera
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Appendix D: Preferred Alternative Development Plan

UTILITY LEGEND

- EXISTING STREAM CORRIDOR PROTECTION ZONE
- PROPOSED STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM TO BE IMPACTED
- EXISTING STREAM TO REMAIN
- PROPOSED STORM PIPE
- PROPOSED STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY

SITE DATA TABLE

TOTAL SITE ACERAGE	228.20 AC.
BUILDING AREA	92.09 AC
TOTAL EX STREAM	7,157 LF (±255 LF PIPED) = 7,412 LF TOT.
IMPACTED STREAM	7,157 LF (±255 LF PIPED) = 7,412 LF TOT.
PROPOSED STREAM	±8283 LF (±1189 LF PIPED) = 9,472 LF TOT.
TOTAL WETLAND AREA	0.78 AC.
IMPACTED WETLAND AREA	0.78 AC.
PROPOSED WETLAND AREA	0.96 AC.
TOTAL SCPZ AREA	20.332 AC.
IMPACTED SCPZ AREA	20.332 AC.
PROPOSED SCPZ AREA	24.190 AC.

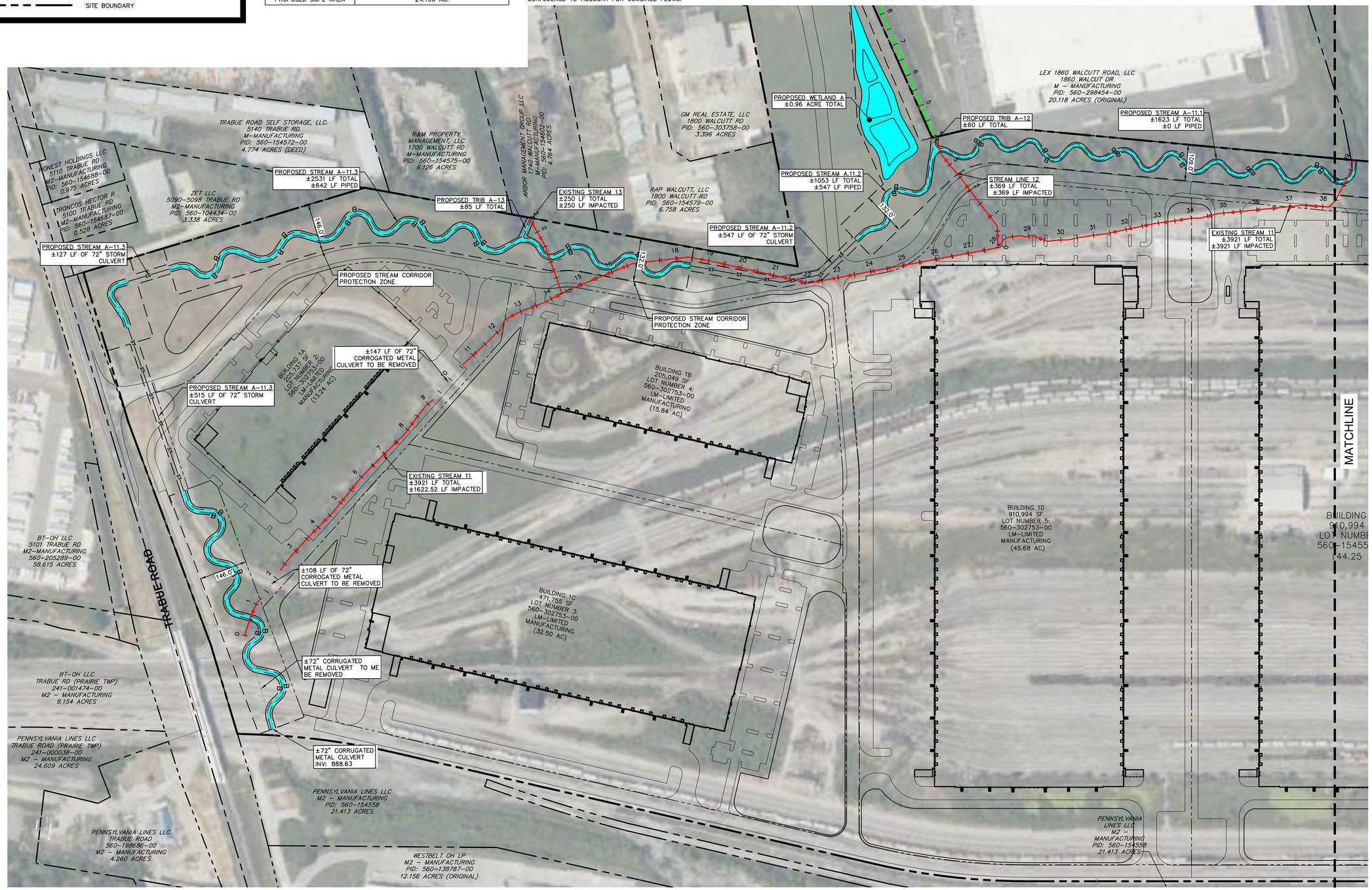
PROPOSED STREAM TABLE

STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
A–11.1 (EX 11)	0.45	109	1,623
A–12 (EX 12)	0.30	93	60
A–11.2 (EX 11 + EX 12)	0.75	132	1,053
A–13 (EX 13)	0.24	85	85
A–11.3 (EX 11 + EX 12 + EX 13)	0.99	146	2,531
B–10.1 (EX 10)	0.40	104	2,523
B–9 (EX 9)	0.57	119	80
B–10.2 (EX 10+ EX 9)	0.97	145	328

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300



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PREFERRED IMPACT LAYOUT

BUCKEYE YARD
COLUMBUS, OHIO

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
1 OF 2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\Exhibits\AllSite\Exhibits\AllSite-FullImpactPlan.dwg 1 OVERALL SITE LAYOUT Oct 17, 2022 1:12pm by: Gavin.Rivera
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UTILITY LEGEND

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- PROPOSED STREAM CORRIDOR PROTECTION ZONE
- EXISTING STREAM TO BE IMPACTED
- EXISTING STREAM TO REMAIN
- PROPOSED STORM PIPE
- PROPOSED STREAM CHANNEL
- EXISTING STORM SEWER
- PROPOSED FACE OF CURB
- PROPOSED LOT LINE
- SITE BOUNDARY

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NORTH

GRAPHIC SCALE IN FEET
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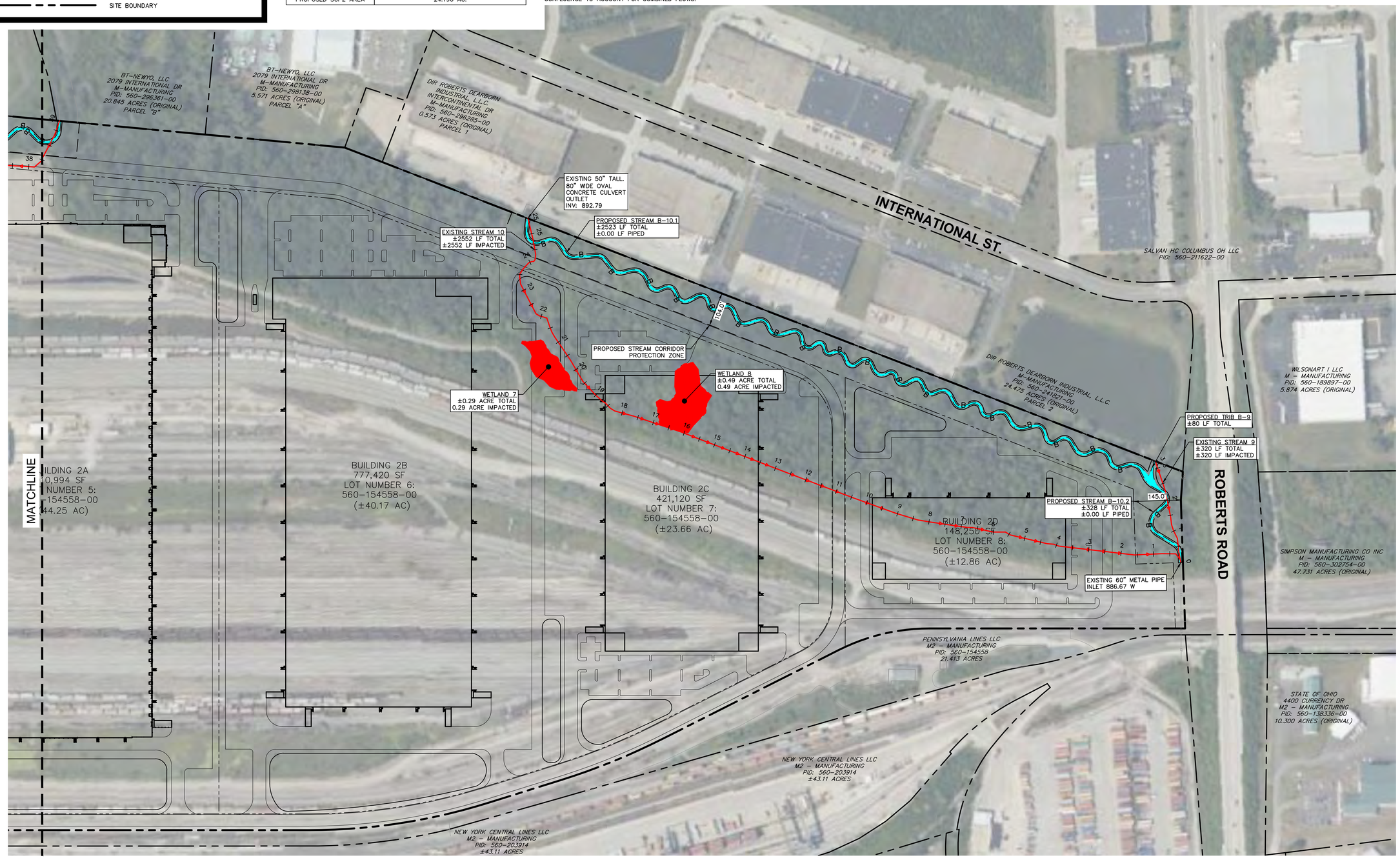

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DRAWN BY: GJR

CHECKED BY: JMM

PREFERRED IMPACT LAYOUT

BUCKEYE YARD
COLUMBUS, OHIO

ORIGINAL ISSUE: 10/17/2022

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Appendix E: Stream Relocation Construction Plan(s)

BUCKEYE XO, LLC

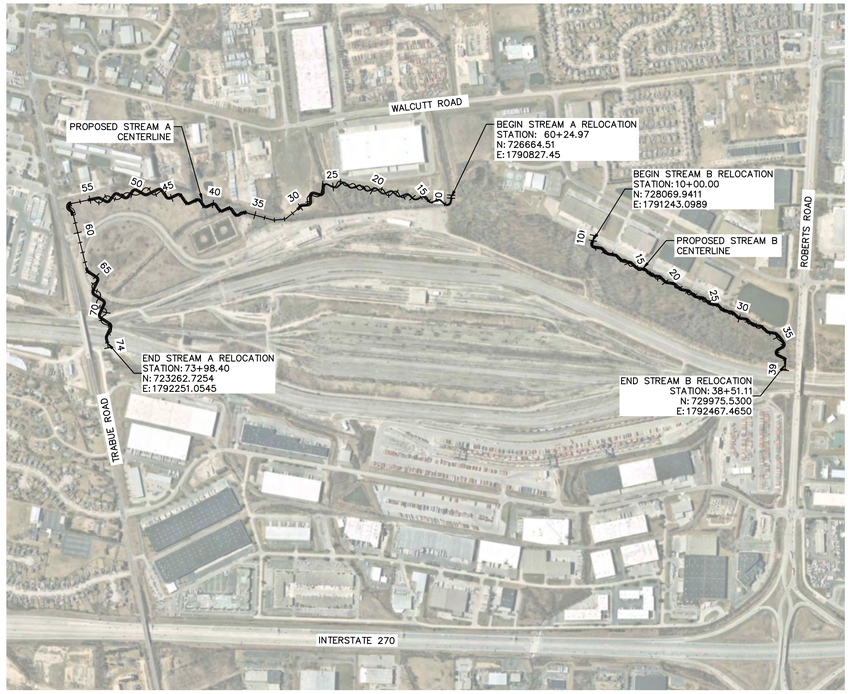
BUCKEYE YARD

STREAM RELOCATION

STATE OF OHIO, FRANKLIN COUNTY

CITY OF COLUMBUS

2022



SITE LOCATION MAP

IMAGE TEXT TAKEN FROM OGRIP. ACCESSED 03/05/2021

GRAPHIC SCALE IN FEET
0 375 750 1500

MITIGATION TABLE			
PROJECT LENGTH			
REACH	EXISTING	PROPOSED TOTAL	IMPACTED TOTAL
STREAM	7412 LF	7722 LF	7412 LF
CULVERTED STREAM	255 LF	1260 LF	255 LF
STREAM CORRIDOR PROTECTION ZONE	20.332 AC.	20.478 AC.	20.332 AC.
WETLANDS	0.78 AC.	0.82 AC.	0.78 AC.

VOLUME TABLE			
DESCRIPTION	CUT (CY)	FILL (CY)	NET (CY)
CUT/FILL VOLUME	208,830	6,061	202,769 (CUT)

Sheet List Table

Sheet Number	Sheet Title
EC1.0	COVER SHEET
EC2.0	EXISTING CONDITIONS
EC2.1	EXISTING CONDITIONS
EC3.0	EROSION AND SEDIMENT CONTROL PLAN – OVERVIEW A
EC3.1	EROSION AND SEDIMENT CONTROL PLAN – OVERVIEW B
EC3.2	EROSION AND SEDIMENT CONTROL PLAN
EC3.3	EROSION AND SEDIMENT CONTROL PLAN
EC3.4	EROSION AND SEDIMENT CONTROL PLAN
EC3.5	EROSION AND SEDIMENT CONTROL PLAN
EC4.0	OVERALL PLAN AND KEY SHEET
EC5.0	TYPICAL SECTIONS
EC5.1	TYPICAL SECTIONS
EC5.2	TYPICAL SECTIONS
EC6.0	STREAM PLAN AND PROFILE
EC6.1	STREAM PLAN AND PROFILE
EC6.2	STREAM PLAN AND PROFILE
EC6.3	STREAM PLAN AND PROFILE
EC6.4	STREAM PLAN AND PROFILE
EC6.5	STREAM PLAN AND PROFILE
EC6.6	STREAM PLAN AND PROFILE
EC6.7	STREAM PLAN AND PROFILE
EC6.8	STREAM PLAN AND PROFILE
EC6.9	STREAM PLAN AND PROFILE
EC6.10	STREAM PLAN AND PROFILE
EC6.11	STREAM PLAN AND PROFILE
EC7.0	STREAM DETAILS
EC7.1	STREAM DETAILS
EC7.2	STREAM DETAILS

STANDARD CONSTRUCTION DRAWINGS	
CITY OF COLUMBUS	
AA-S153	AA-S134B

USGS 8-DIGIT HUC BOUNDARY MAP

UPPER SCIOTO
HUC ID: 05060001
NOT TO SCALE

UPPER PORTION OF EXISTING STREAM 11

LOWER PORTION OF EXISTING STREAM 11

UPPER PORTION OF EXISTING STREAM 10

LOWER PORTION OF EXISTING STREAM 10

OHIO Utilities Protection SERVICE
Click, Call or Tap Before You Dig

PROJECT TEAM

DEVELOPER/OWNER
BUCKEYE XO, LLC
2100 ROSS AVE, STE. 895
DALLAS, TX 75201
TEL: (469) 226-1269
EMAIL: WILLIAMS@XEBECREALTY.COM
CONTACT: WILLIAM SHANNON

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
7965 NORTH HIGH STREET, SUITE 200
COLUMBUS, OH 43235
TEL: (614) 454-6696
CONTACT: JUSTIN MULLER, P.E.
EMAIL: JUSTIN.MULLER@KIMLEY-HORN.COM

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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WWW.KIMLEY-HORN.COM

SCALE:

DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

COVER SHEET

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022

KHA PROJECT NO. 190118000

SHEET NUMBER

EC1.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\COVER SHEET.dwg Layout1 Oct 17, 2022 5:00pm by: Gavin.Rivera
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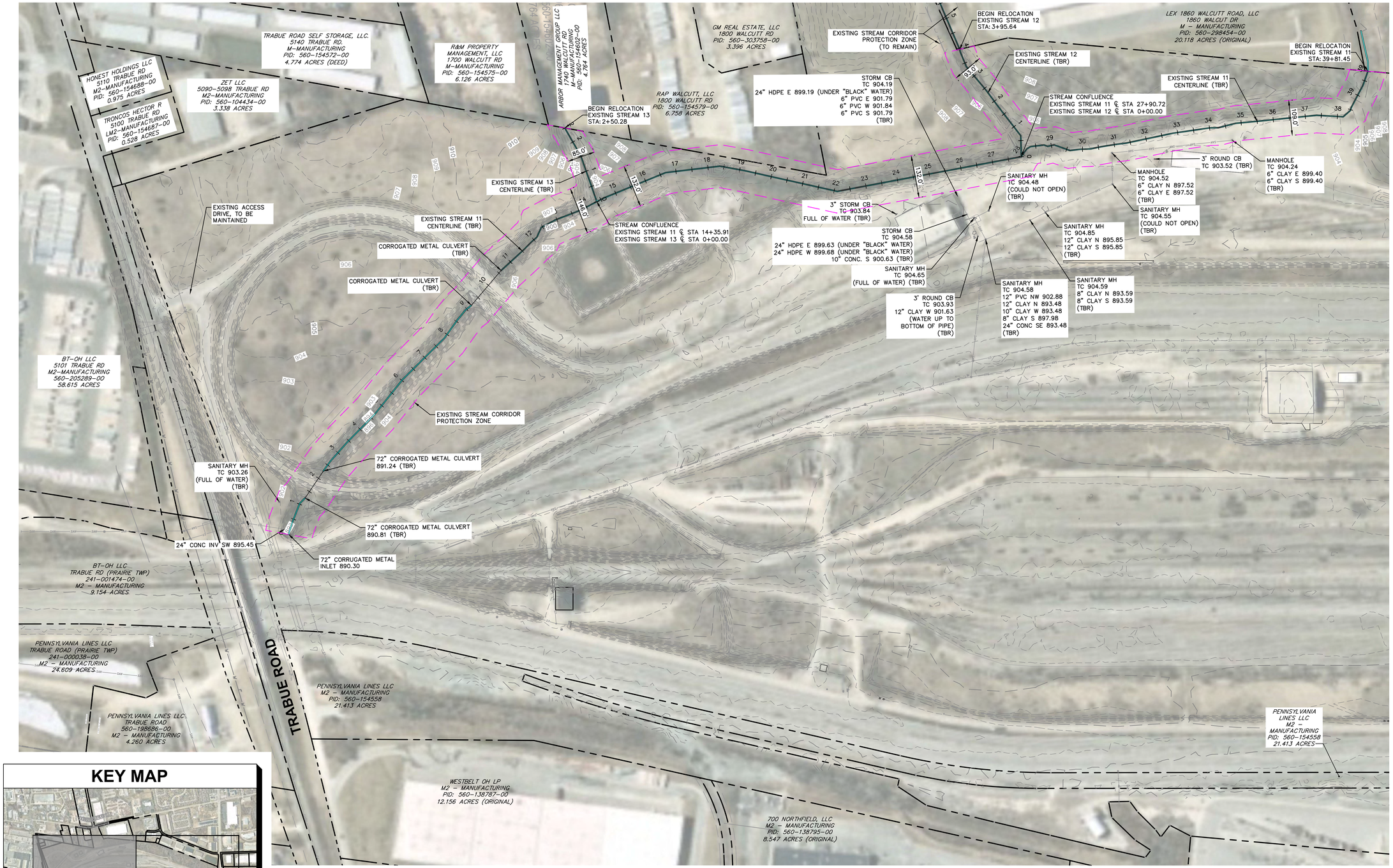

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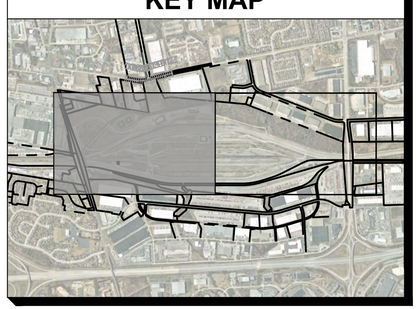

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING PAVEMENT
- EXISTING CENTERLINE
- EXISTING STORM
- EXISTING SANITARY
- EXISTING PAVEMENT
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD LINE
- EXISTING ELECTRIC
- EXISTING STREAM CORRIDOR PROTECTION ZONE TO BE REPLACED (±20.332 AC.)
- STREAM CHANNEL

EXISTING STREAM TABLE

STREAM	TRIBUTARY AREA (MI²)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
9	0.57	119	±320
10	0.40	104	±2552
11	0.45	109	±3921
12	0.30	93	±369
13	0.24	85	±250

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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WWW.KIMLEY-HORN.COM

SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EXISTING CONDITIONS

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC2.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EXISTING CONDITIONS.dwg OVERVIEW A Oct 17, 2022 5:00pm by: Gavin.Rivera
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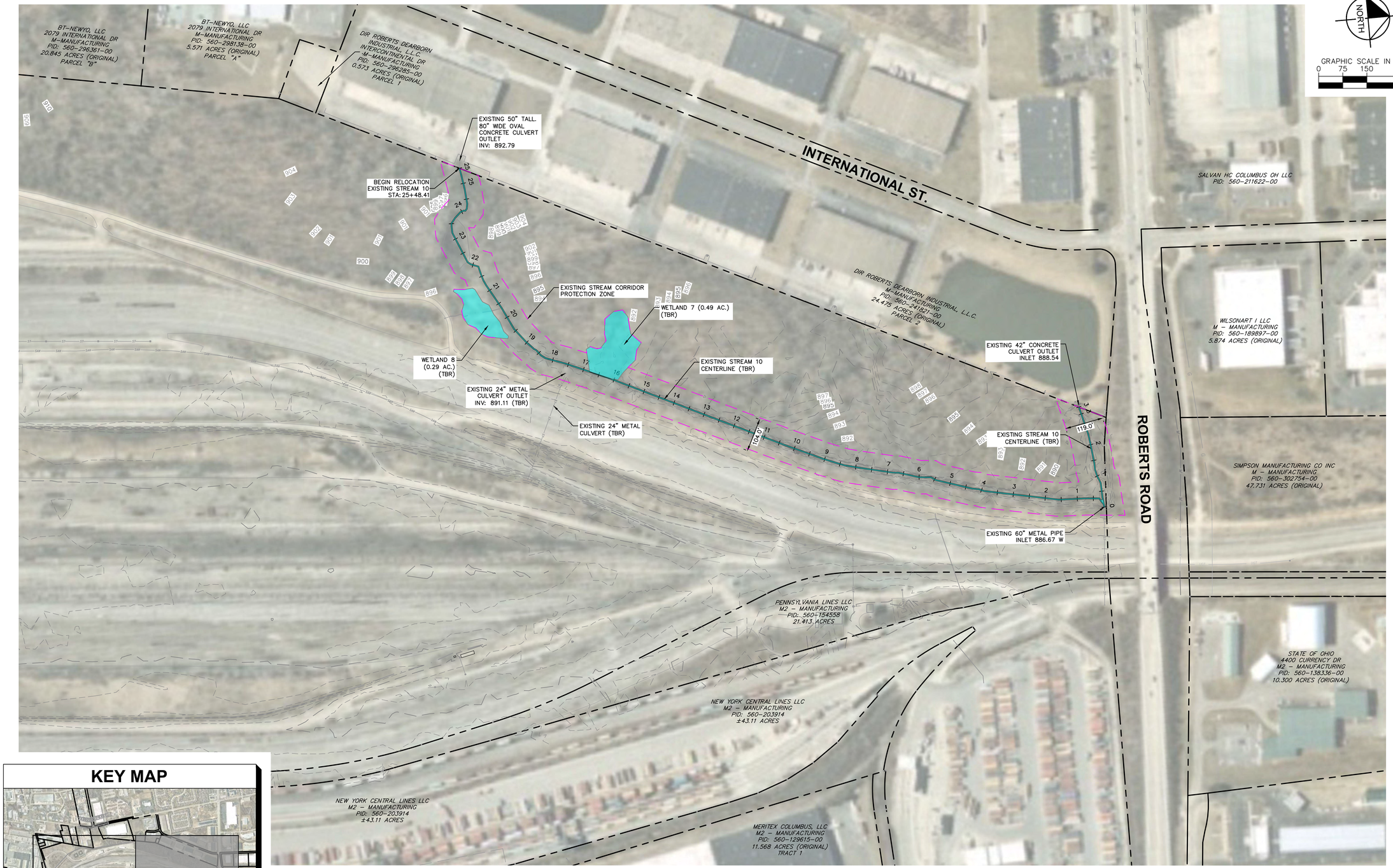
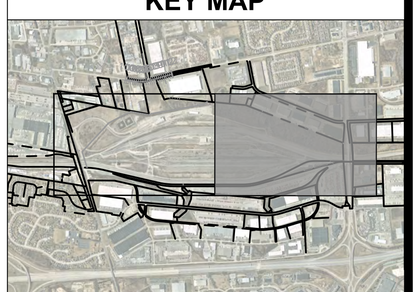


KEY MAP



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No.	REVISIONS	DATE	BY	APR DATE	APR BY

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WWW.KIMLEY-HORN.COM

SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EXISTING CONDITIONS

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC2.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EXISTING CONDITIONS.dwg OVERVIEW B Oct 17, 2022 5:00pm by: Gavin.Rivera
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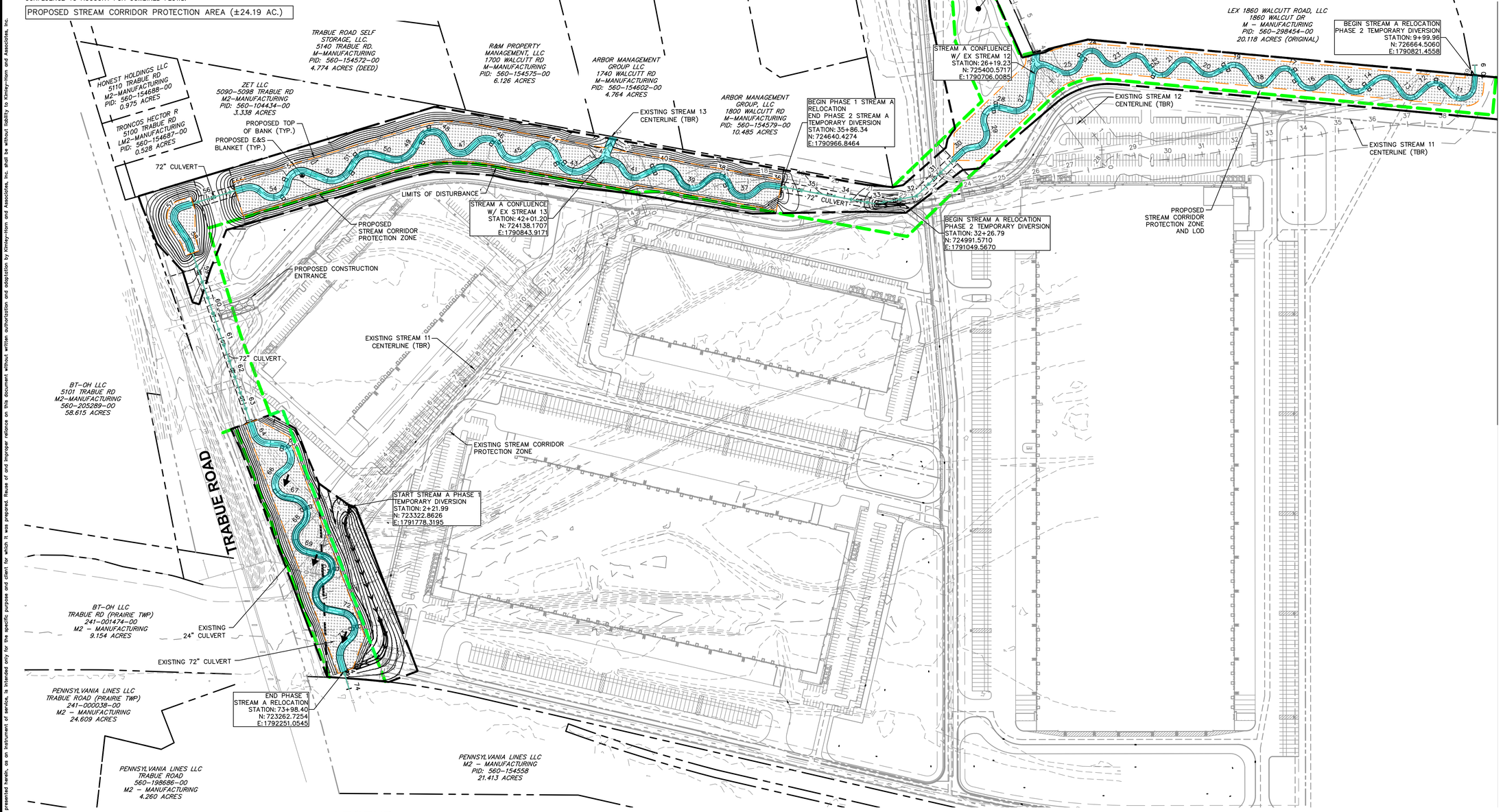
PROPOSED STREAM TABLE

STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
A–11.1 (EX 11)	0.45	109	1,623
A–11.2 (EX 11 + EX 12)	0.75	132	1,053
A–11.3 (EX 11 + EX 12 + EX 13)	0.99	146	2,531
B–10.1 (EX 10)	0.40	104	2,523
B–10.2 (EX 10+ EX 9)	0.97	145	328

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

PROPOSED STREAM CORRIDOR PROTECTION AREA (±24.19 AC.)



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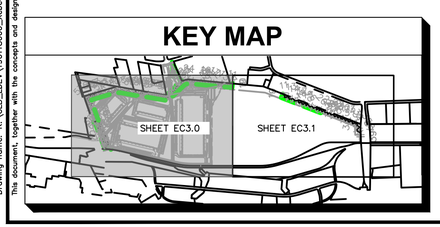

LEGEND

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- EXISTING RIGHT OF WAY
- EXISTING PAVEMENT
- EXISTING STORM
- EXISTING STREAM CENTERLINE
- EXISTING GAS LINE
- EXISTING OVERHEAD LINE
- PROPOSED RIGHT–OF–WAY
- PROPOSED STORM
- PROPOSED LIMITS OF DISTURBANCE (±24.09 AC)
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- PROPOSED TOP OF BANK
- PROPOSED STREAM CENTERLINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STREAM CHANNEL
- PROPOSED E&S BLANKET
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED RIFFLE (SEE DETAILS)
- PROPOSED BOULDER VANE AND J–HOOK (SEE DETAILS)
- PROPOSED TOE WOOD (SEE DETAILS)

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

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WWW.KIMLEY–HORN.COM

SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN - OVERVIEW A

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg OVERVIEW A Oct 17, 2022 5:00pm by: Gavin.Rivera
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PROPOSED STREAM CORRIDOR PROTECTION AREA (±24.19 AC.)

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

BT–NEWYO, LLC.
2079 INTERNATIONAL DR
M–MANUFACTURING
PID: 560–296361–00
20.845 ACRES (ORIGINAL)
PARCEL "B"

BT–NEWYO, LLC
2079 INTERNATIONAL DR
M–MANUFACTURING
PID: 560–2981,38–00
5.571 ACRES (ORIGINAL)
PARCEL "A"

IR ROBERTS DEARBORN INDUSTRIAL, L.L.C.
INTERCONTINENTAL DR
M–MANUFACTURING
PID: 560–296285–00
0.573 ACRES (ORIGINAL)
PARCEL 1

EXISTING 50" TALL, 80" WIDE OVAL CONCRETE CULVERT OUTLET INVERT: 892.79

BEGIN STREAM B RELOCATION
STATION: 10+00.00
N: 728069.9404
E: 1791243.1024

DIR ROBERTS DEARBORN INDUSTRIAL, L.L.C.
M–MANUFACTURING
PID: 560–241821–00
24.475 ACRES (ORIGINAL)
PARCEL 2

PROPOSED E&S BLANKET (TYP.)

PROPOSED TOP OF BANK (TYP.)

PROPOSED STREAM CORRIDOR PROTECTION ZONE

WETLAND 7 (0.49 AC.) (TBR)

WETLAND 8(0.29 AC.) (TBR)

EXISTING STREAM 10 CENTERLINE (TBR)

LIMITS OF DISTURBANCE

EXISTING STREAM CORRIDOR PROTECTION ZONE

EXISTING 42" CONCRETE CULVERT OUTLET INLET 888.54

EXISTING STREAM 10 CENTERLINE (TBR)

STREAM B CONFLUENCE W/ EX STREAM 9
STATION: 35+32.62
N: 729924.4493
E: 1792205.7444

ROBERTS ROAD

EXISTING 60" METAL PIPE INLET 886.67

END STREAM B RELOCATION
STATION: 38+49.48
N: 729975.1471
E: 1792465.8037

WILSONART I LLC
M – MANUFACTURING
PID: 560–189897–00
5.874 ACRES (ORIGINAL)

PENNSYLVANIA LINES LLC
M2 – MANUFACTURING
PID: 560–154558
21.413 ACRES

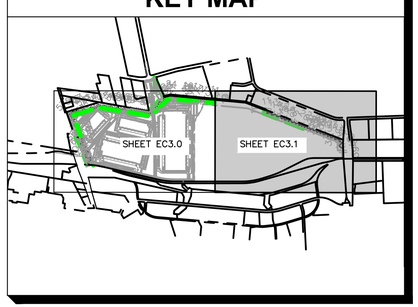
NEW YORK CENTRAL LINES LLC
M2 – MANUFACTURING
PID: 560–203914
±43.11 ACRES

STATE OF OHIO
4400 CURRENCY DR
M2 – MANUFACTURING
PID: 560–138336–00
10.300 ACRES (ORIGINAL)

NEW YORK CENTRAL LINES LLC
M2 – MANUFACTURING
PID: 560–203914
±43.11 ACRES

MERITEX COLUMBUS, LLC
M2 – MANUFACTURING
PID: 560–129615–00
11.568 ACRES (ORIGINAL)
TRACT 1

KEY MAP



LEGEND

- EXISTING PROPERTY LINE
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- EXISTING STORM
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- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED RIFFLE (SEE DETAILS)
- PROPOSED BOULDER VANE AND J–HOOK (SEE DETAILS)
- PROPOSED TOE WOOD (SEE DETAILS)

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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COLUMBUS, OH 43235
PHONE: 614–472–8546
WWW.KIMLEY–HORN.COM

SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN - OVERVIEW B

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg OVERVIEW B Oct 17, 2022 5:00pm by: Gavin.Rivera
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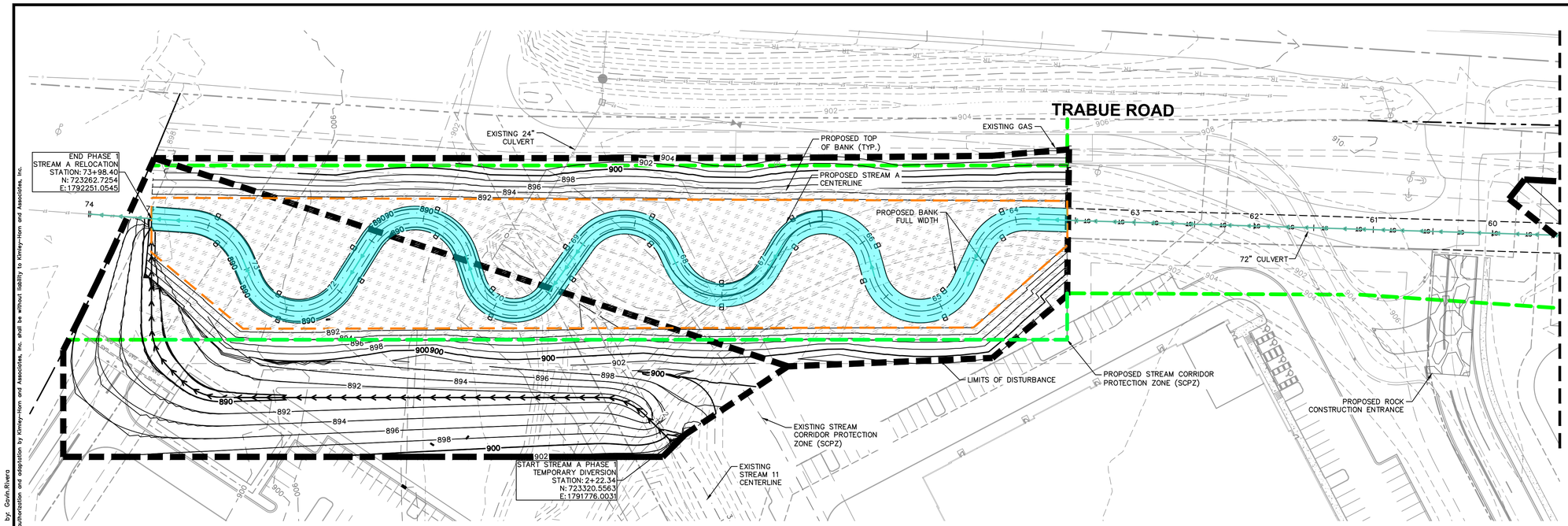

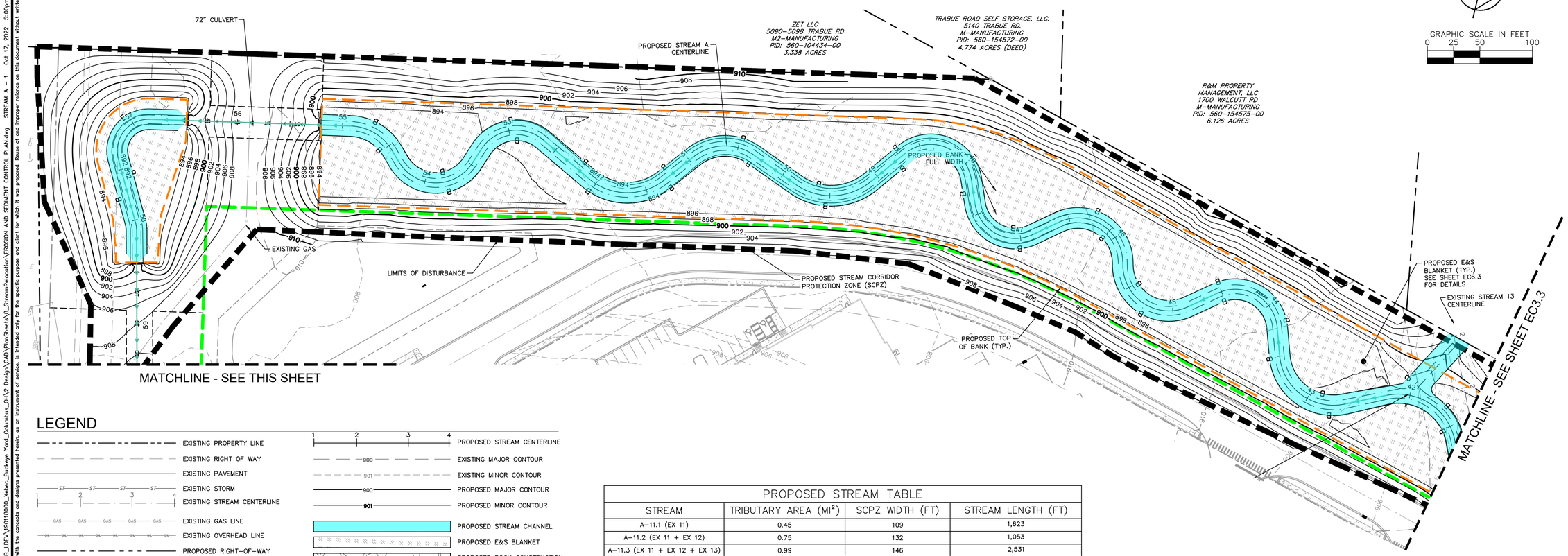

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PROPOSED STREAM TABLE

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PROPOSED STREAM CORRIDOR PROTECTION AREA (24.19 AC.)

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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PHONE: 614-472-8546
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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg STREAM A – 1 Oct 17, 2022 5:00pm by: Gavin.Rivera
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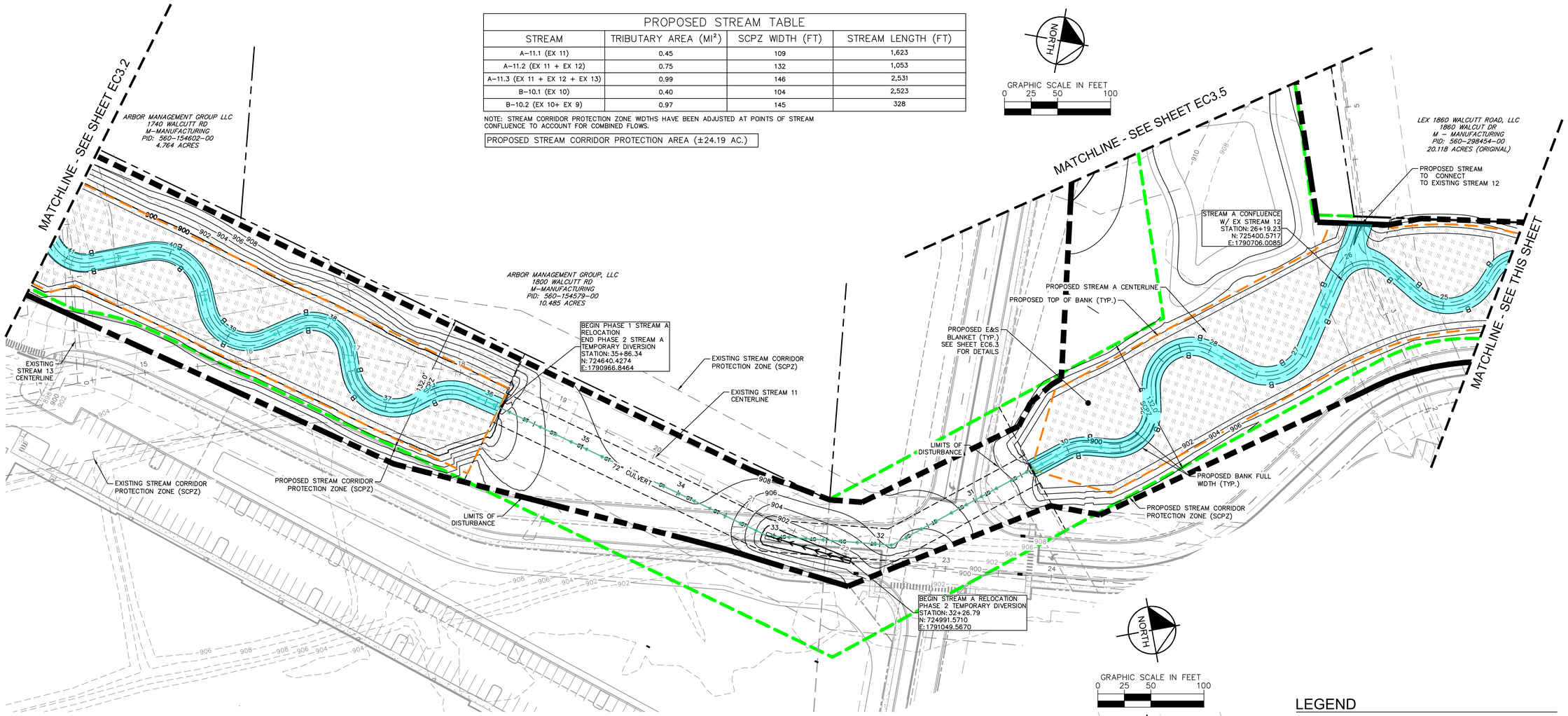

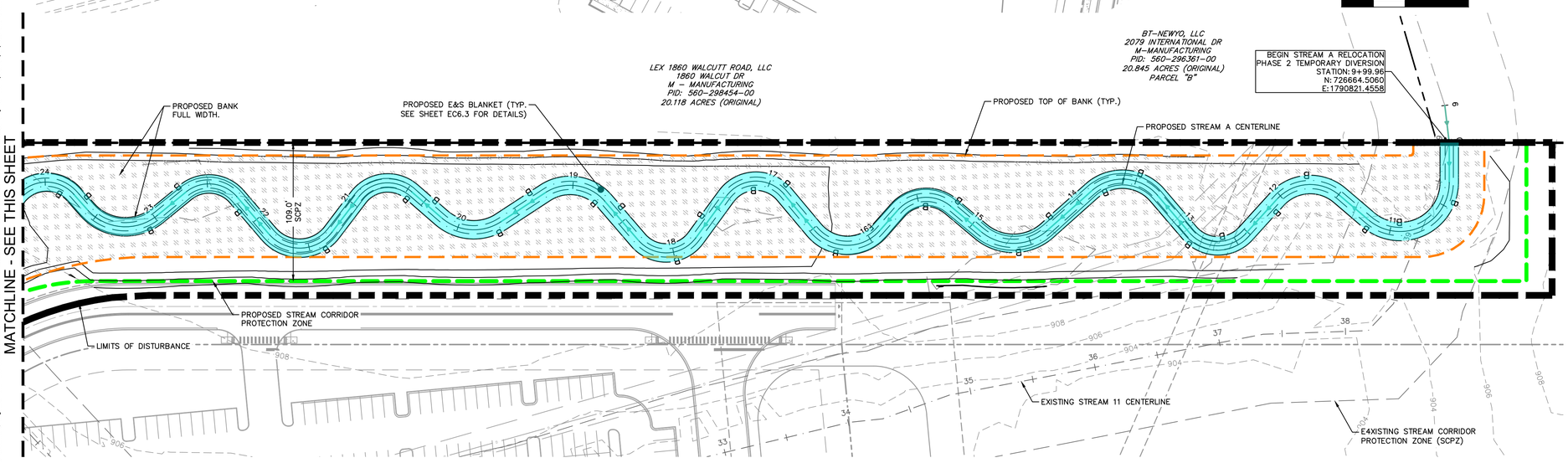

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- PROPOSED MINOR CONTOUR
- PROPOSED STREAM CHANNEL
- PROPOSED E&S BLANKET

No.	REVISIONS	DATE	BY	APR DATE	APR BY

Kimley»Horn

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.3

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\6_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg STREAM A – 2 Oct 17, 2022 5:00pm by: Gavin.Rivera
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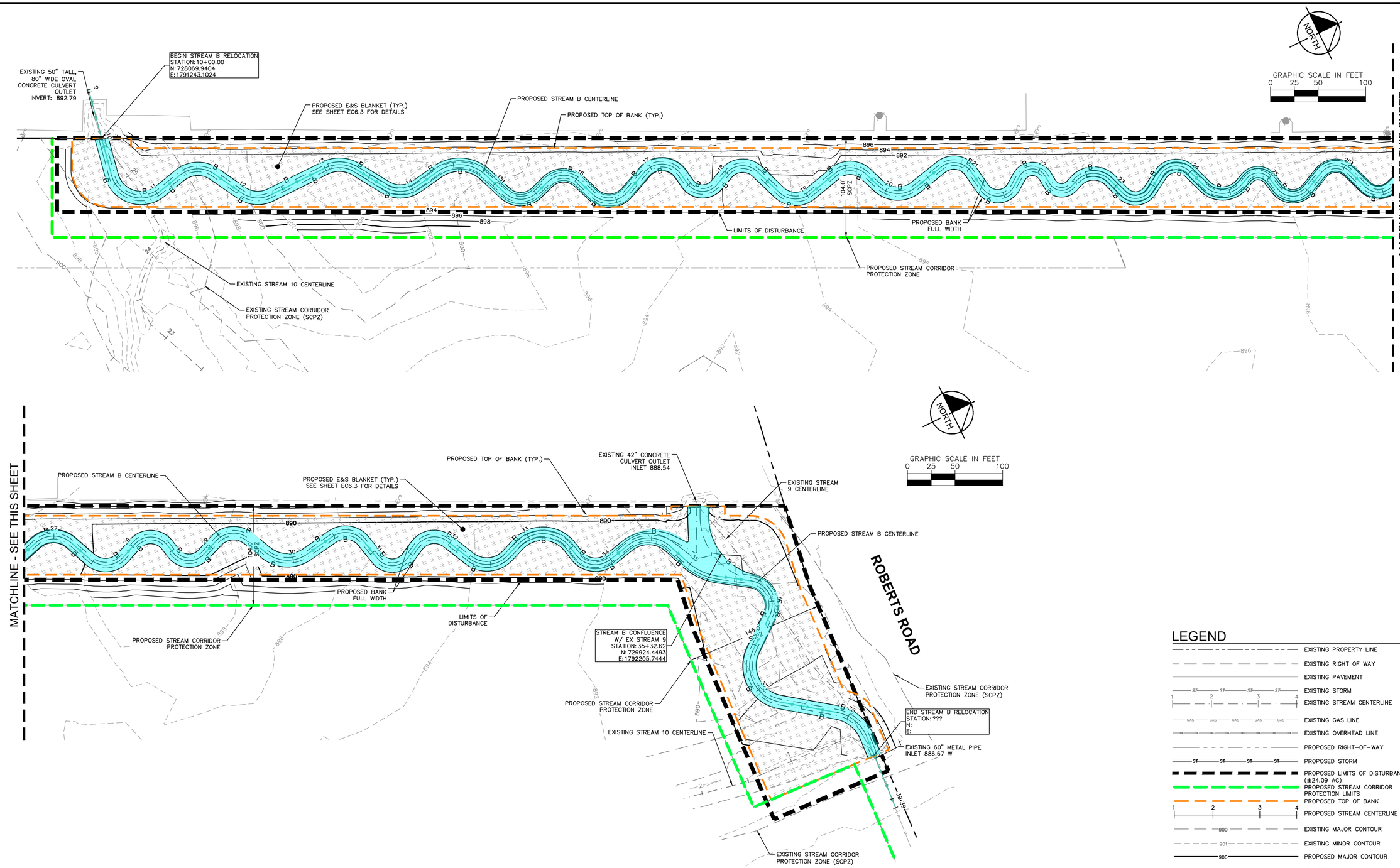

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING PAVEMENT
- EXISTING STORM
- EXISTING STREAM CENTERLINE
- EXISTING GAS LINE
- EXISTING OVERHEAD LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED STORM
- PROPOSED LIMITS OF DISTURBANCE (±24.09 AC)
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- PROPOSED TOP OF BANK
- PROPOSED STREAM CENTERLINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STREAM CHANNEL
- PROPOSED E&S BLANKET
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED RIFFLE (SEE DETAILS)
- PROPOSED BOULDER VANE AND J-HOOK (SEE DETAILS)
- PROPOSED TOE WOOD (SEE DETAILS)

PROPOSED STREAM TABLE

STREAM	TRIBUTARY AREA (MI^2)	SCPZ WIDTH (FT)	STREAM LENGTH (FT)
A-11.1 (EX 11)	0.45	109	1,623
A-11.2 (EX 11 + EX 12)	0.75	132	1,053
A-11.3 (EX 11 + EX 12 + EX 13)	0.99	146	2,531
B-10.1 (EX 10)	0.40	104	2,523
B-10.2 (EX 10+ EX 9)	0.97	145	328

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

PROPOSED STREAM CORRIDOR PROTECTION AREA (±24.19 AC.)

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.4

Drawing name: K:\CLB_LDEV\190118000_Xbec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg STREAM B Oct 17, 2022 5:00pm by: Gavin.Rivera
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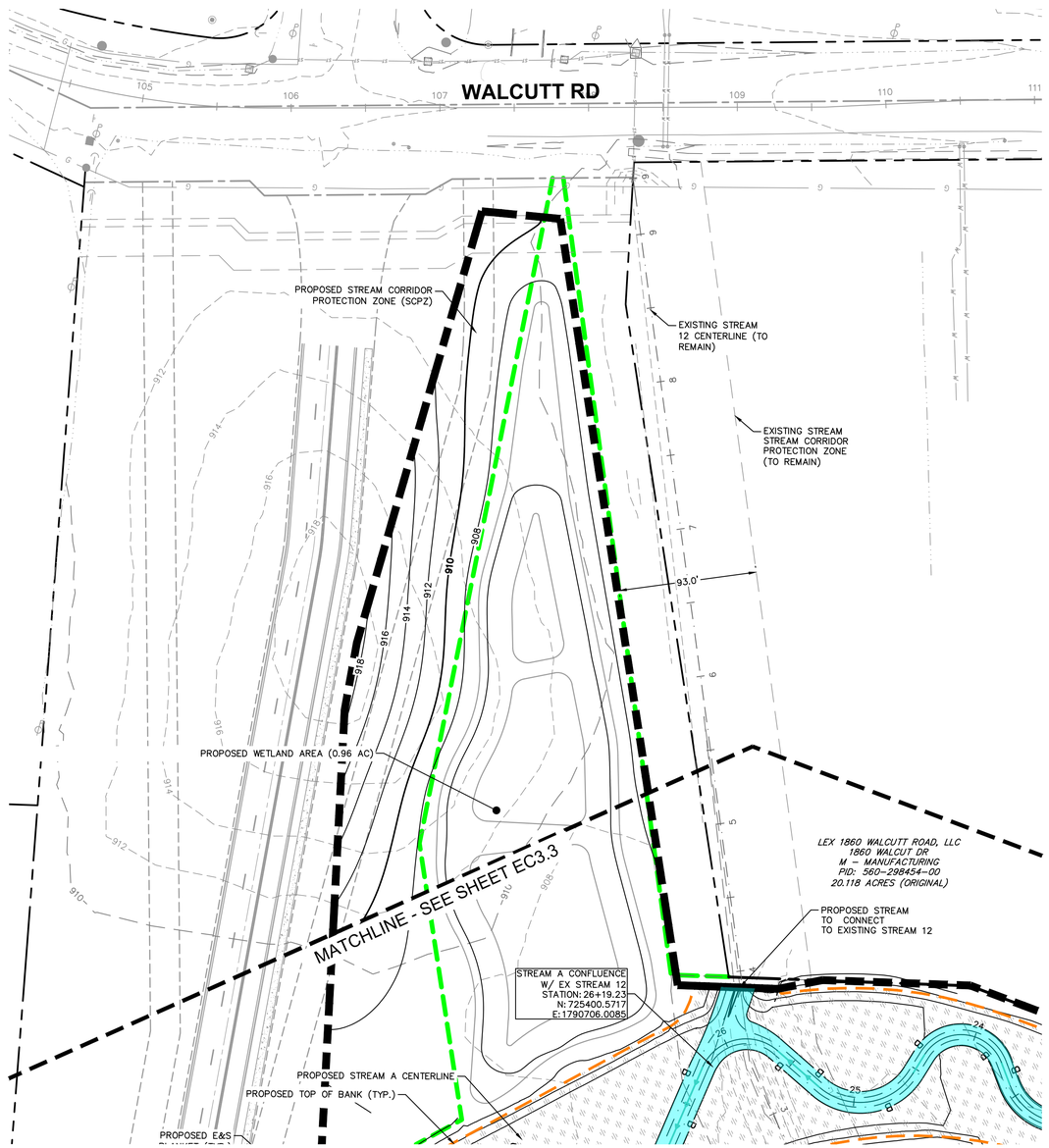

GRAPHIC SCALE IN FEET
0 25 50 100

NORTH

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING PAVEMENT
- EXISTING STORM
- EXISTING STREAM CENTERLINE
- EXISTING GAS LINE
- EXISTING OVERHEAD LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED STORM
- PROPOSED LIMITS OF DISTURBANCE (±24.09 AC)
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- PROPOSED TOP OF BANK
- PROPOSED STREAM CENTERLINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STREAM CHANNEL
- PROPOSED E&S BLANKET
- PROPOSED ROCK CONSTRUCTION ENTRANCE

PROPOSED STREAM TABLE			
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A-11.2 (EX 11 + EX 12)	0.75	132	1,053
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B-10.1 (EX 10)	0.40	104	2,523
B-10.2 (EX 10+ EX 9)	0.97	145	328

NOTE: STREAM CORRIDOR PROTECTION ZONE WIDTHS HAVE BEEN ADJUSTED AT POINTS OF STREAM CONFLUENCE TO ACCOUNT FOR COMBINED FLOWS.

PROPOSED STREAM CORRIDOR PROTECTION AREA (±24.19 AC.)

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

EROSION AND SEDIMENT CONTROL PLAN

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.5

Drawing name: K:\CLB_LDEV\190118000_Xbec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\EROSION AND SEDIMENT CONTROL PLAN.dwg EC3.5 EROSION AND SEDIMENT CONTROL PLAN Oct 17, 2022 5:00pm by: Gavin.Rivera
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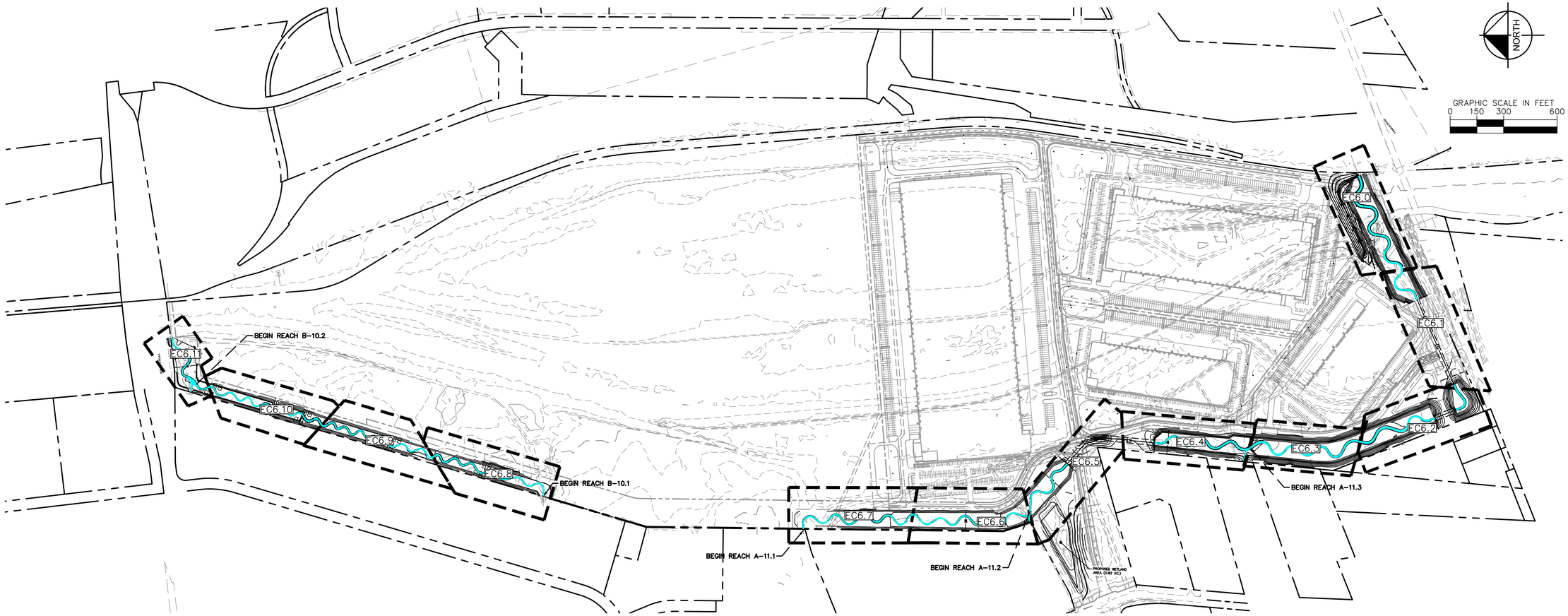

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING PAVEMENT
- EXISTING STORM
- EXISTING STREAM CENTERLINE
- EXISTING GAS LINE
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- PROPOSED TOP OF BANK
- PROPOSED STREAM CENTERLINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED STREAM BANKFULL
- PROPOSED MINOR CONTOUR
- PROPOSED STREAM CHANNEL
- PROPOSED E&S BLANKET
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED CONST RIFFLE (SEE DETAILS)
- PROPOSED RIFFLE (SEE DETAILS)
- PROPOSED TOE WOOD (SEE DETAILS)
- PROPOSED ROCK TOE (SEE DETAILS)

VARIABLES (All units are in Feet)	Reach A-11 DESIGN		Reach A-11.2 DESIGN		Reach A-11.3 DESIGN		Reach B-10.1 DESIGN		Reach B-10.2 DESIGN	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1 Stream Type (Rosgen)	C4		C4		C4		C4		C4	
2 Drainage Area (square miles)	0.45		0.75		0.99		0.36		0.40	
3 Bankfull Width (W_{bkf})	14.5		17.1		19.7		14.0		14.3	
4 Bankfull Mean Depth (d_{bkf})	0.7		0.9		1.0		0.7		0.7	
5 Width/Depth Ratio (W_{bkf}/d_{bkf})	20.1		19.9		19.7		19.7		19.9	
6 Bankfull Cross-Sectional Area (A_{bkf})	10.5		14.8		19.7		14.0		14.3	
7 Bankfull Mean Velocity, ft/s (V_{bkf})	1.3		1.6		1.4		1.1		1.2	
8 Bankfull Discharge, cfs (Q_{bkf})	13.7		23.4		26.9		16.1		16.6	
9 Bankfull Maximum Depth (d_{max})	1.0		1.2		1.4		1.0		1.0	
10 Max d_{max}/d_{bkf} ratio	1.4		1.4		1.4		1.4		1.4	
11 Low Bank Height to Max Bankfull d_{bkf} ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
12 Width of Flood Prone Area (W_{fpa})	75.0	80.0	80.0	101.0	120.0	125.0	70.0	75.0	120.0	130.0
13 Entrenchment Ratio (W_{fpa}/W_{bkf})	5.2	5.5	4.7	5.9	6.1	6.3	5.0	5.4	8.4	9.1
14 Meander Length (L_m)	115.0	174.0	156.0	192.0	158.0	183.0	90.0	110.0	43.0	155.0
15 Ratio of Meander Length to Bankfull Width (L_m/W_{bkf})	7.9	12.0	9.1	11.2	8.0	9.3	6.4	7.9	3.0	10.8
16 Radius of Curvature (R_c)	29.0	44.0	34.0	55.0	39.0	57.0	28.0	42.0	29.0	57.0
17 Ratio of Radius of Curvature to Bankfull Width (R_c/W_{bkf})	2.0	3.0	2.0	3.2	2.0	2.9	2.0	3.0	2.0	4.0
18 Belt Width (W_{blt})	62.0	81.0	72.0	92.0	82.0	105.0	50.0	55.0	60.0	65.0
19 Belt Width Ratio (W_{blt}/W_{bkf})	4.3	5.6	4.2	5.4	4.2	5.3	3.6	3.9	4.2	4.5
20 Sinuosity (k) (Stream Length / Valley Length)	1.54		1.14		1.41		1.58		1.58	
21 Valley Slope (S_{valley}) (ft/ft)	0.00370		0.00320		0.00240		0.00300		0.00300	
22 Average Stream Slope (S_{avg}) = (S_{valley}/k)	0.00240		0.00280		0.00170		0.00190		0.00190	
23 Riffle Slope (S_{rif})	0.0071	0.0125	0.0118	0.0160	0.0051	0.0111	0.0051	0.0200	0.0051	0.0080
24 Ratio of Riffle Slope to Avg. Slope (S_{riffle}/S_{avg})	4.2	5.7	4.2	5.7	3.0	6.5	2.7	10.5	2.7	4.2
25 Pool Slope (S_{pool})	0.0000	0.0002	0.0000	0.0003	0.0000	0.0002	0.0000	0.0002	0.0000	0.0002
26 Ratio of Pool Slope to Avg. Slope (S_{pool}/S_{avg})	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
27 Maximum Pool Depth (D_{pool})	1.5		1.7		1.9		1.5		1.5	
28 Ratio of Pool Depth to Bkf Depth (D_{pool}/d_{bkf})	2.1		2.0		1.9		2.1		2.1	
29 Pool Width (W_{pool})	17.2		20.4		23.6		16.7		17.0	
30 Ratio of Pool Width to Bankfull Width (W_{pool}/W_{bkf})	1.2		1.2		1.2		1.2		1.2	
31 Pool Area (A_{pool})	13.4		18.9		25.3		12.7		13.1	
32 Ratio of Pool Area to Bankfull Area (A_{pool}/A_{bkf})	1.3		1.3		1.3		0.9		0.9	
33 Pool to Pool Spacing (p - p)	72.5	101.5	85.5	119.7	98.5	137.9	70.0	98.0	71.5	100.1
34 Ratio of Pool to Pool Spacing to Bankfull Width ($p\text{-}p/W_{bkf}$)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

OVERALL PLAN AND KEY SHEET

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC4.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\KEY SHEET.dwg EC4.0 OVERALL PLAN AND KEY SHEET Oct 17, 2022 5:00pm by: Gavin.Rivera
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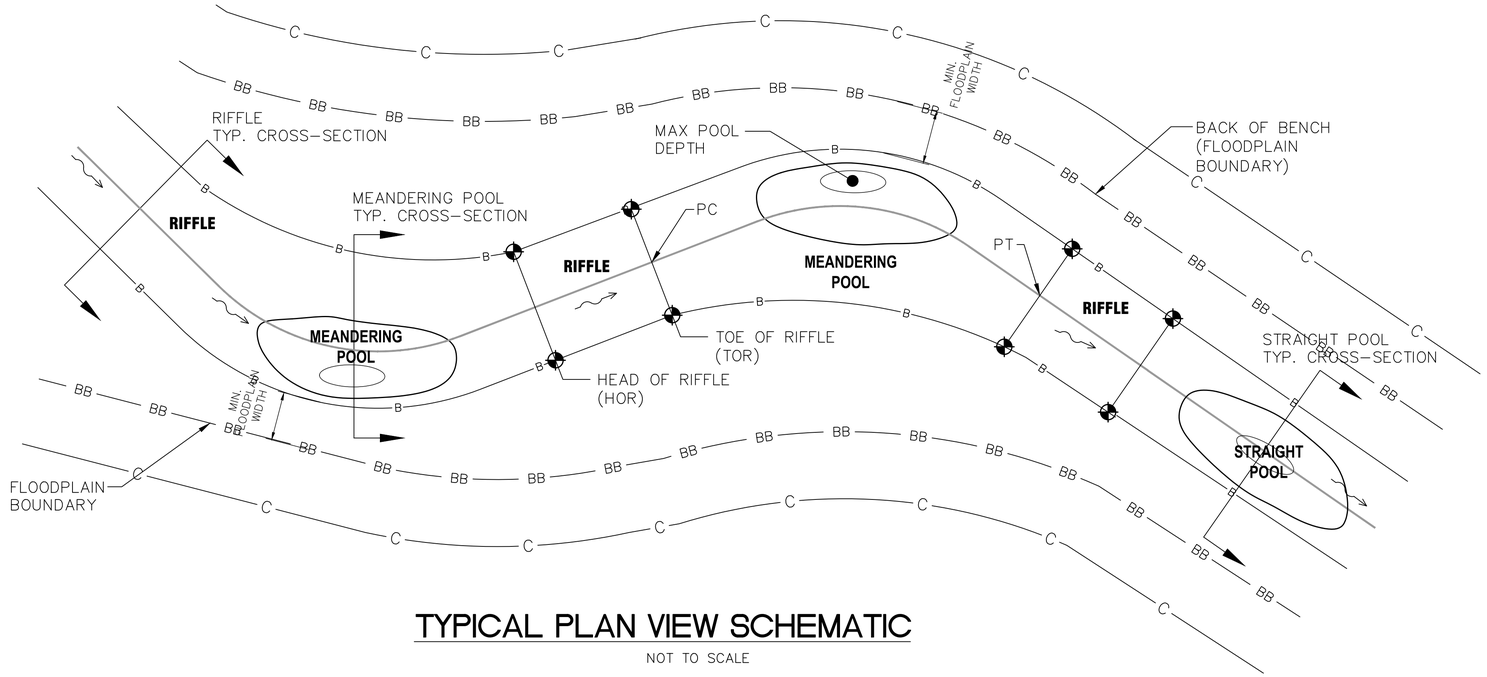
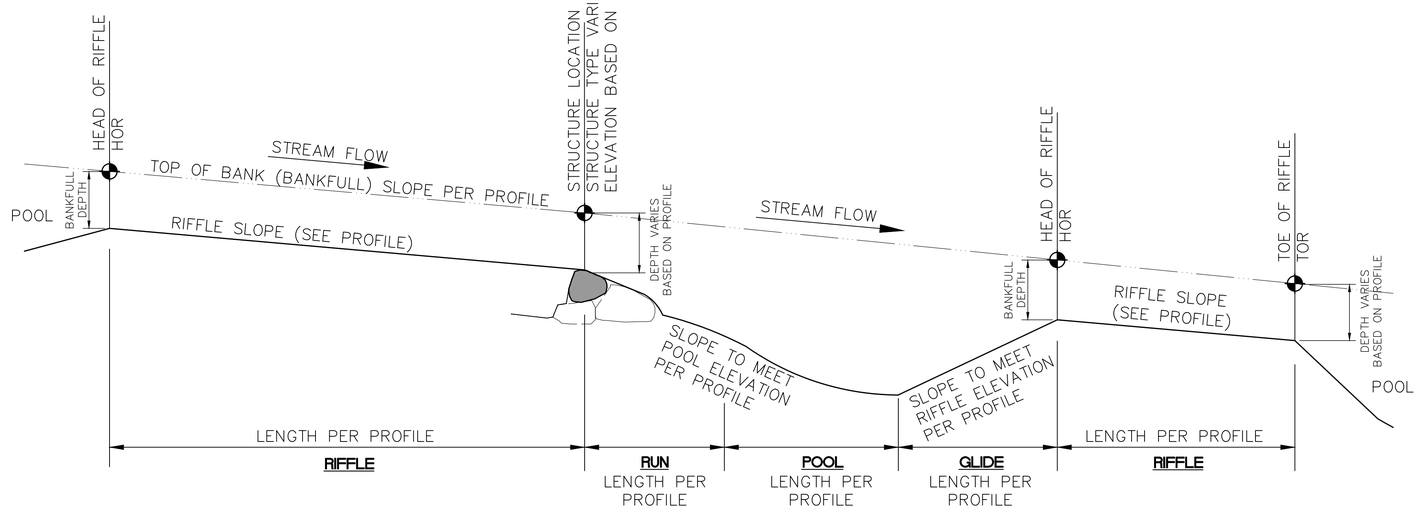


TYPICAL PLAN VIEW SCHEMATIC

NOT TO SCALE



TYPICAL PROFILE OF RIFFLE/POOL SEQUENCE

NOT TO SCALE

NOTES:

TYPICAL SECTIONS ARE PROVIDED TO GIVE THE GENERAL DIMENSIONS OF THE CHANNEL.

FINAL GRADING WILL GIVE THE CHANNEL A MORE "NATURAL" APPEARANCE AND ALLOW A SMOOTH TRANSITION FROM EXISTING CHANNEL TO NEW CHANNEL AND BETWEEN RIFFLE AND POOL SECTIONS.

RIFFLE FLOODPLAIN WIDTH VARIES BASED ON THE TYPICAL POOL DIMENSIONS AND THE VALLEY WIDTH SHOWN ON THE PLAN SHEETS.

THE CURVE BETWEEN THE PC AND PT SHOULD BE ROUNDED.

LEGEND:

VERIFY BASED ON TYPICAL BANKFULL

VERTICAL CONTROL FROM PROFILE

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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EC5.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM 30-TYPICAL SECTIONS.dwg EC5.0 TYPICAL SECTIONS Oct 17, 2022 5:00pm by: Gavin.Rivera
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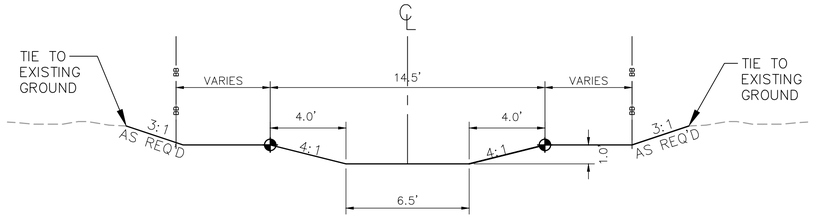
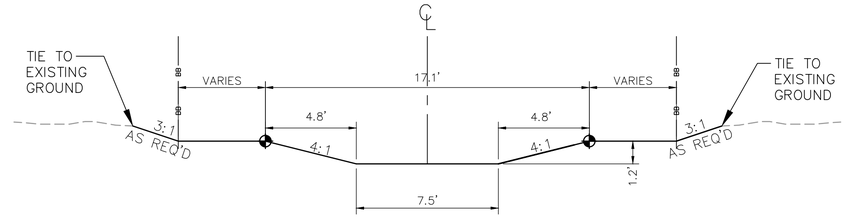


REACH A-11 - RIFFLE

STA: 10+00 TO 26+23

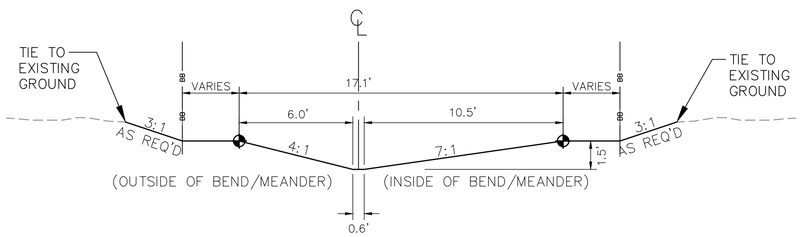
NOT TO SCALE



REACH A-12 - RIFFLE

STA: 26+23 TO 42+23

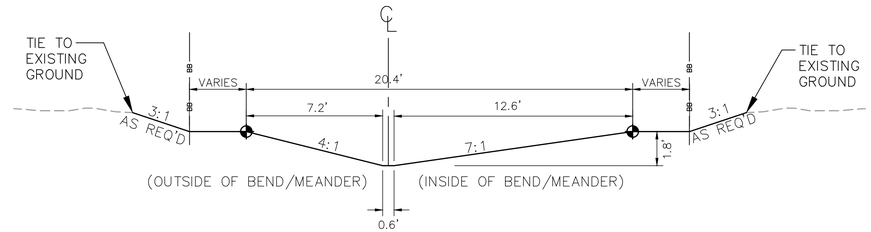
NOT TO SCALE



REACH A-11 - POOL ON BEND

STA: 10+00 TO 26+23

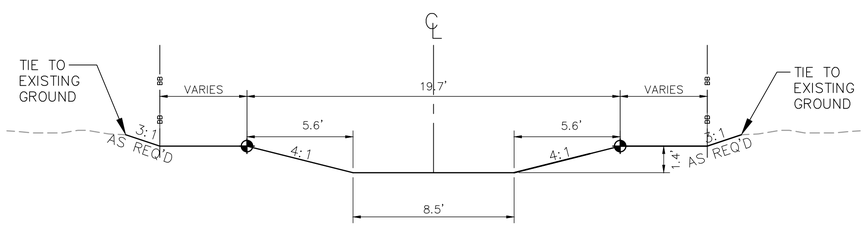
NOT TO SCALE



REACH A-12 - POOL ON BEND

STA: 26+23 TO 42+23

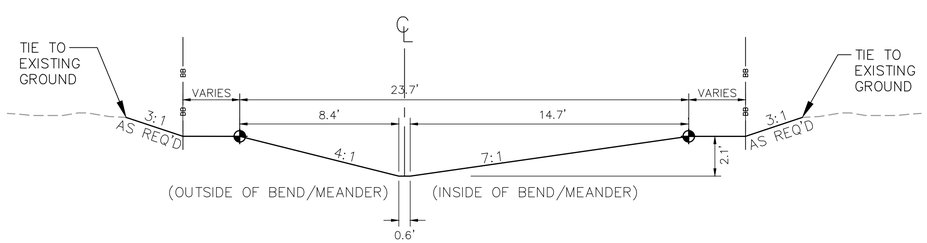
NOT TO SCALE



REACH A-13 - RIFFLE

STA: 42+23 TO 73+98

NOT TO SCALE



REACH A-13 - POOL ON BEND

STA: 42+23 TO 73+98

NOT TO SCALE

NOTE:

POOL TYPICALS WILL BE FLIPPED WHEN INSIDE OF MEANDER IS ON THE LEFT SIDE.

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CITY OF COLUMBUS, FRANKLIN COUNTY, OH

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EC5.1

Drawing name: K:\CLB_LDEV\190118000_Xbec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM 30-TYPICAL SECTIONS.dwg EC5.1 TYPICAL SECTIONS Oct 17, 2022 5:00pm by: Gavin.Rivera
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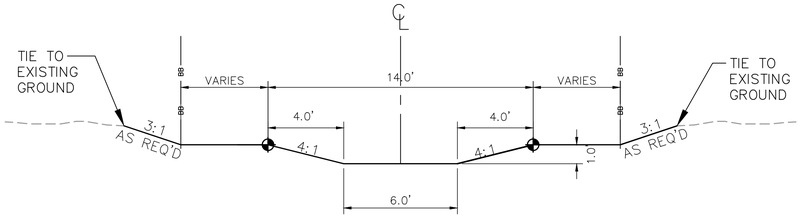
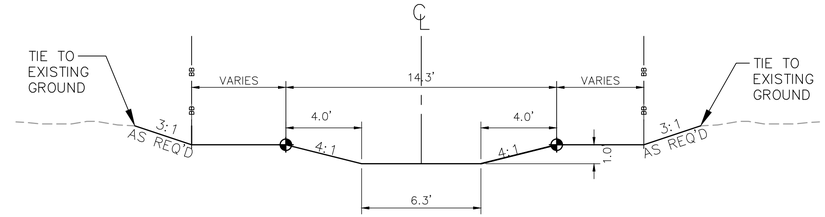


REACH B-9 - RIFFLE

STA: 10+00 TO 35+33

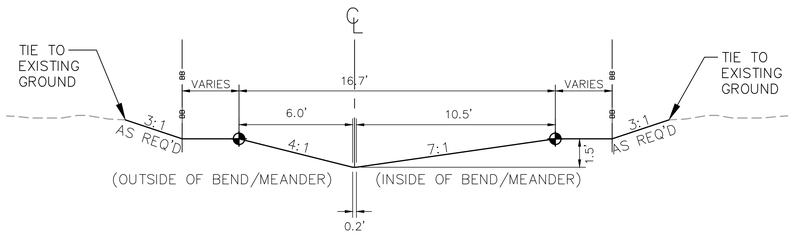
NOT TO SCALE



REACH B-10 - RIFFLE

STA: 35+33 TO 38+51

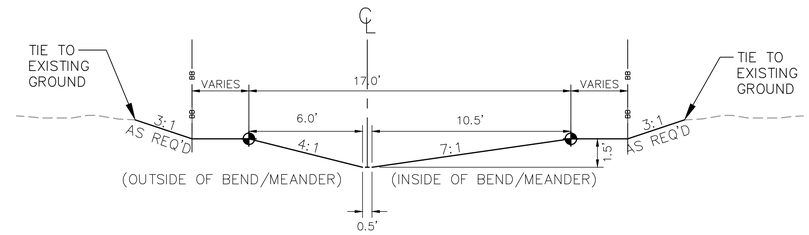
NOT TO SCALE



REACH B-9 - POOL ON BEND

STA: 10+00 TO 35+33

NOT TO SCALE



REACH B-10 - POOL ON BEND

STA: 35+33 TO 38+51

NOT TO SCALE

NOTE:

POOL TYPICALS WILL BE FLIPPED WHEN INSIDE OF MEANDER IS ON THE LEFT SIDE.

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SHEET NUMBER

EC5.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\B_StreamRelocation\STREAM 30-TYPICAL SECTIONS.dwg EC5.2 TYPICAL SECTIONS Oct 17, 2022 5:00pm by: Gavin.Rivera
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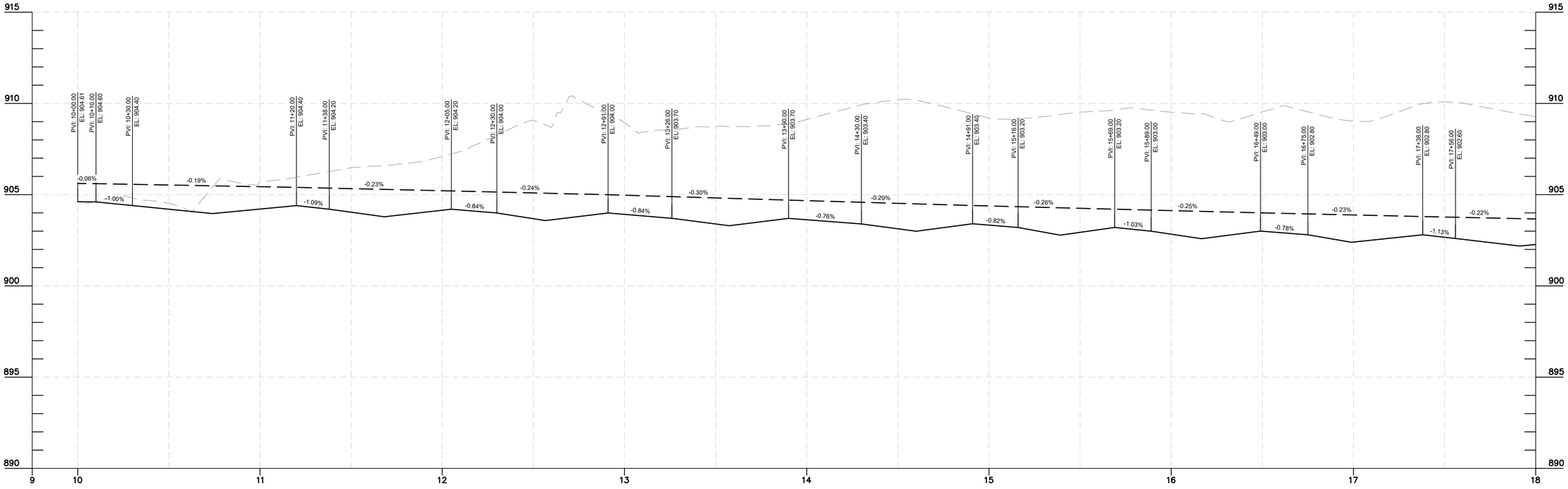

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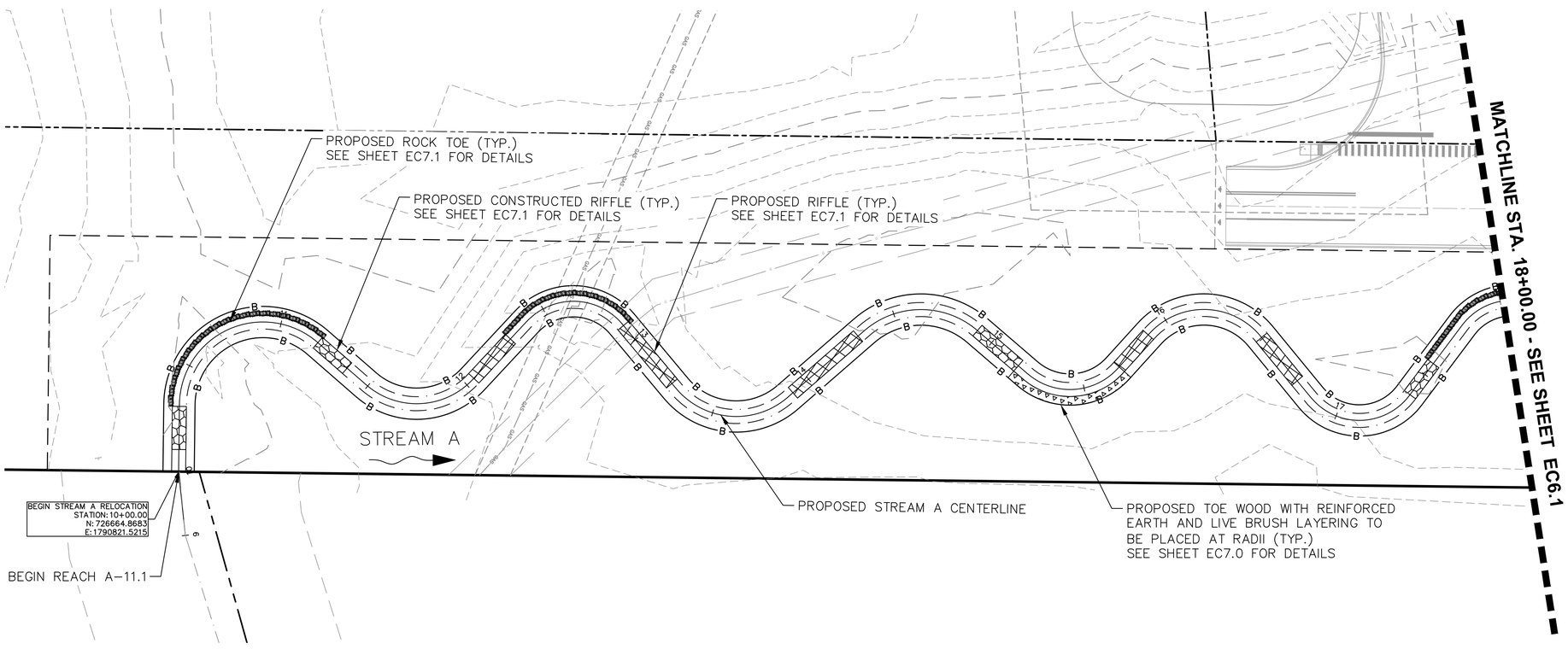

NORTH

GRAPHIC SCALE IN FEET
0 15 30 60

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC6.0

Drawing name: K:\CB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.0 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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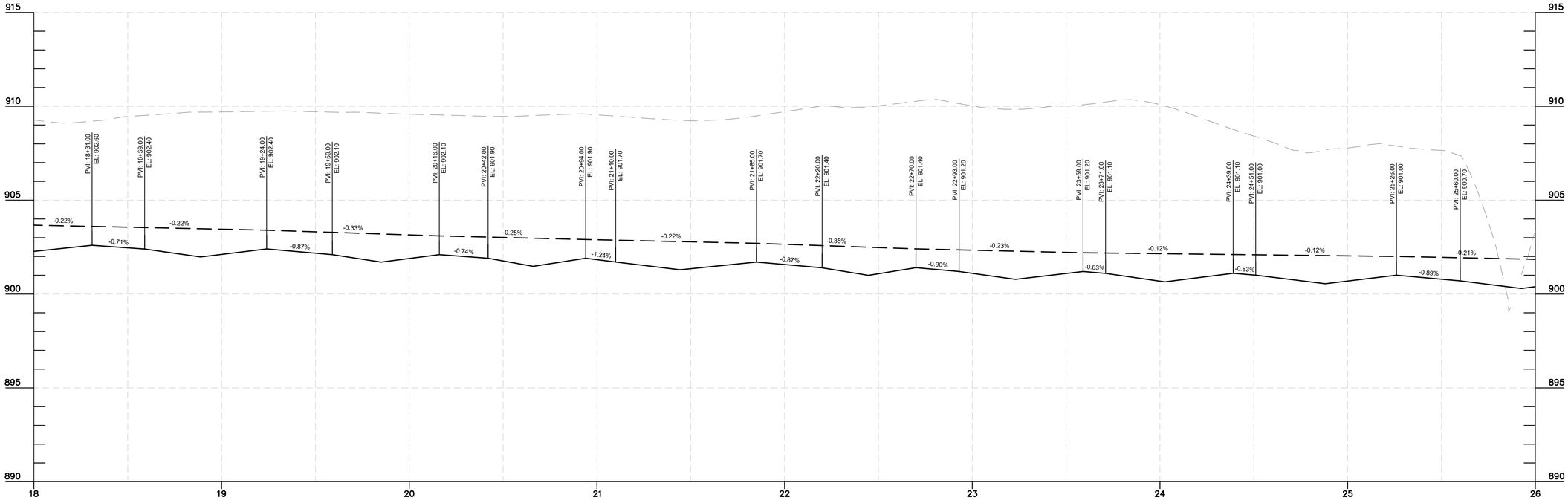

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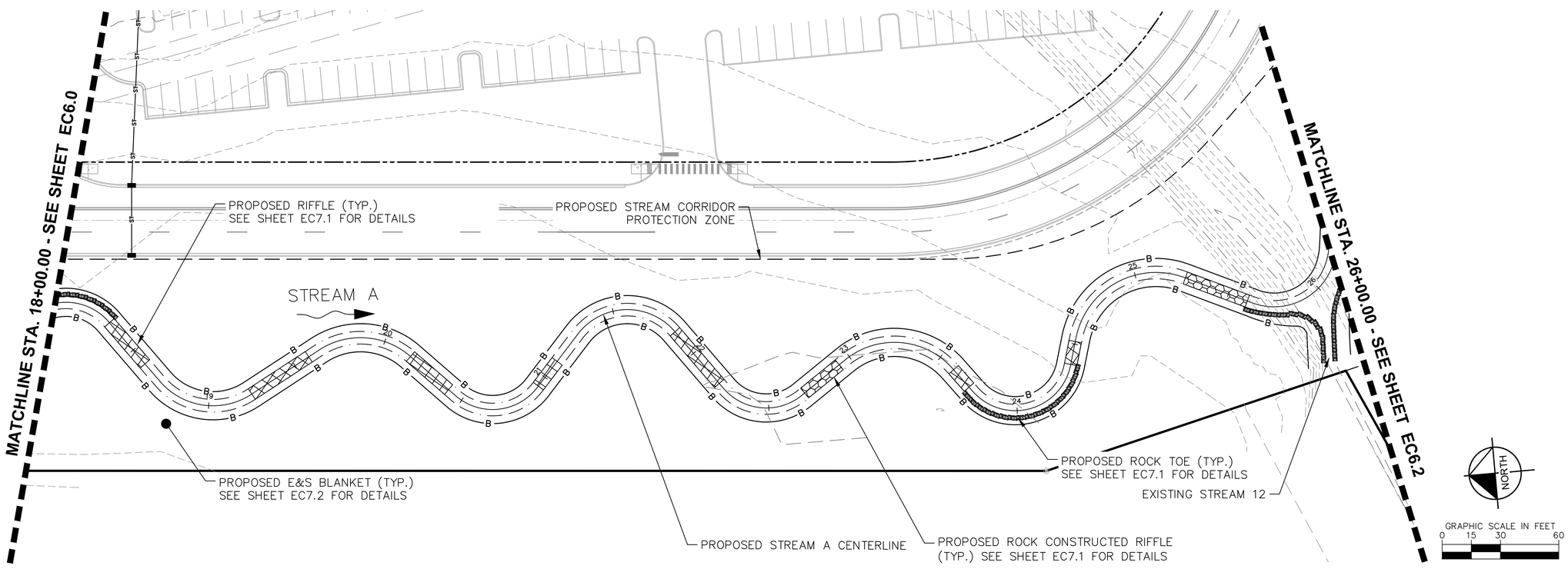

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DRAWN BY: MCS
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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC6.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.1 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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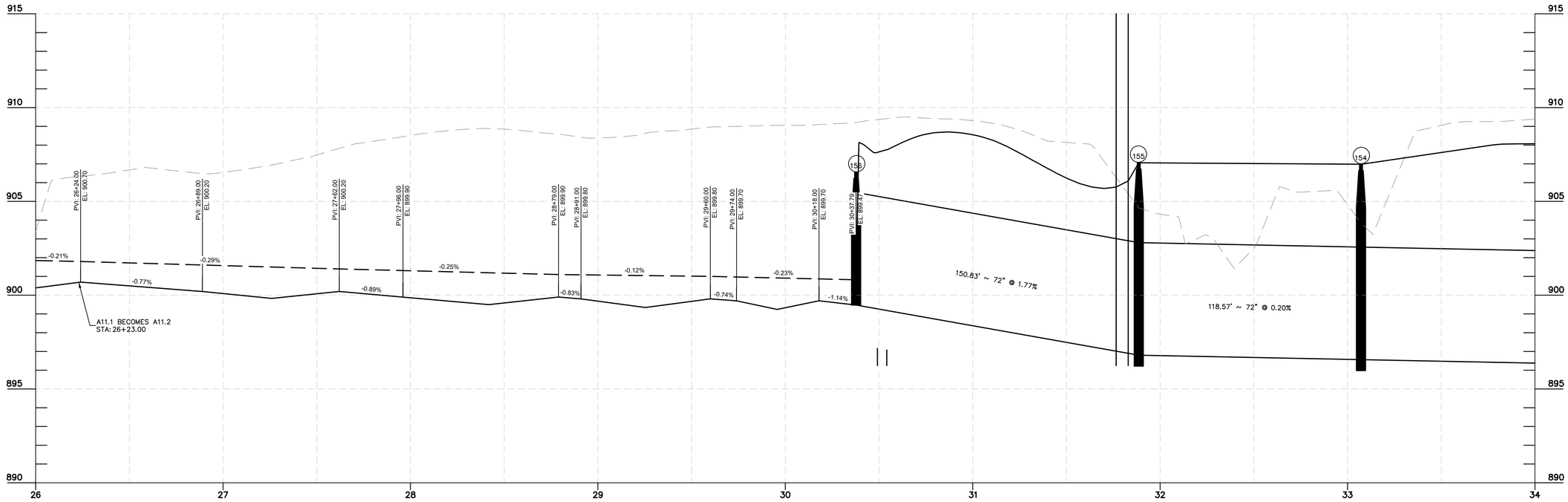

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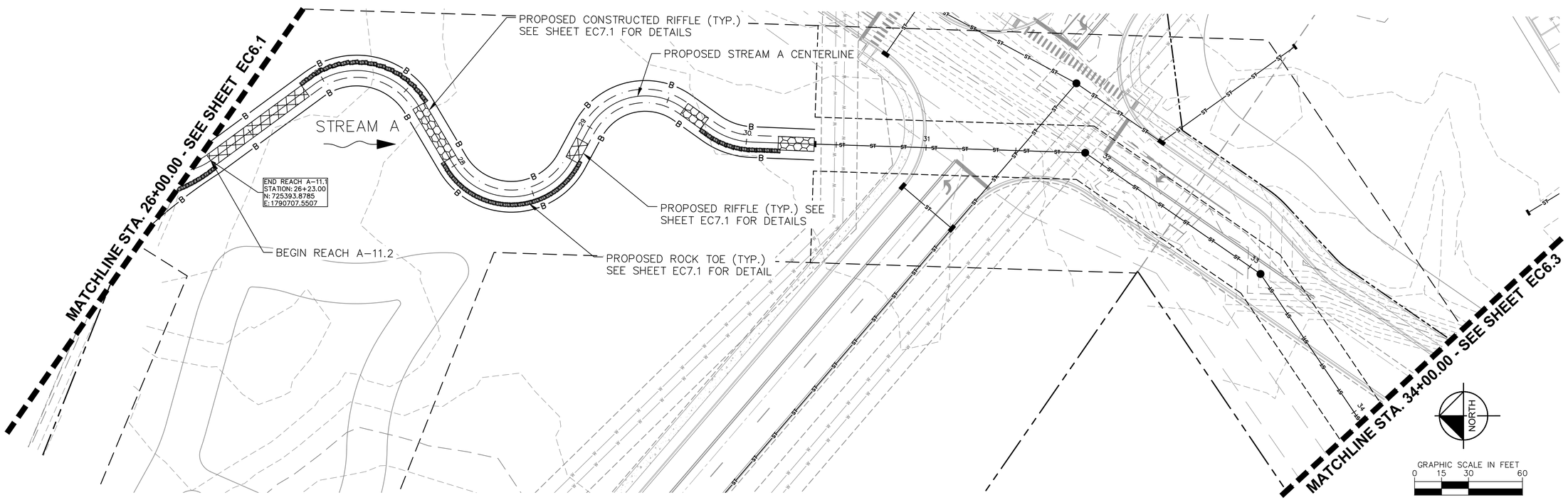

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022
KHA PROJECT NO.
190118000
SHEET NUMBER
EC6.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.2 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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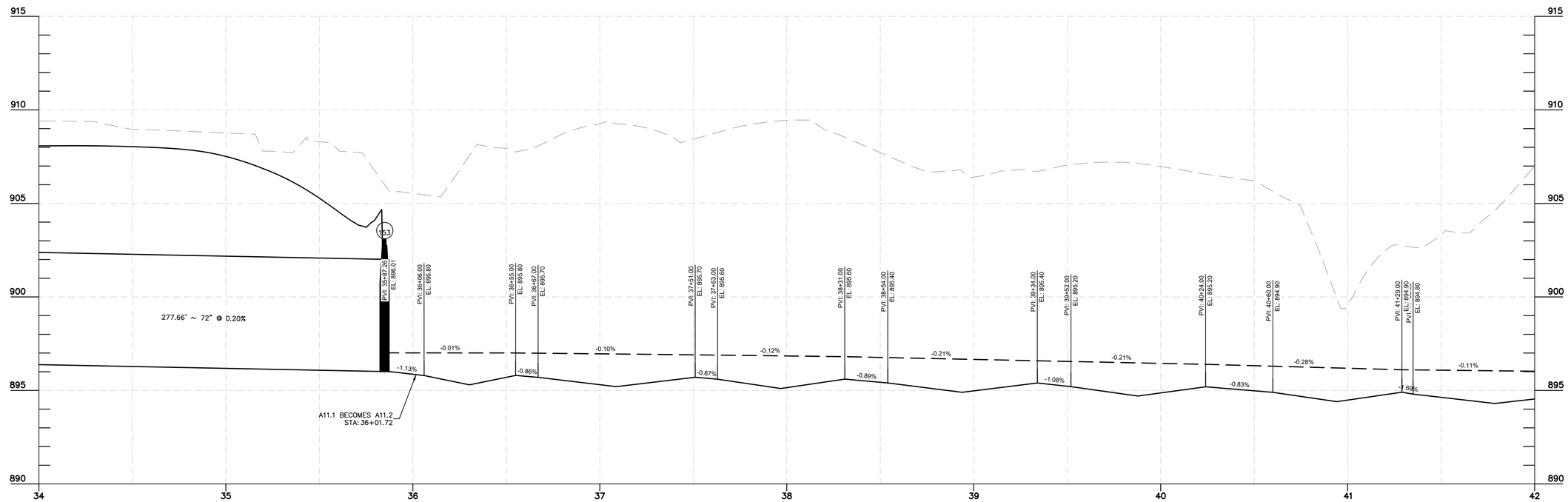

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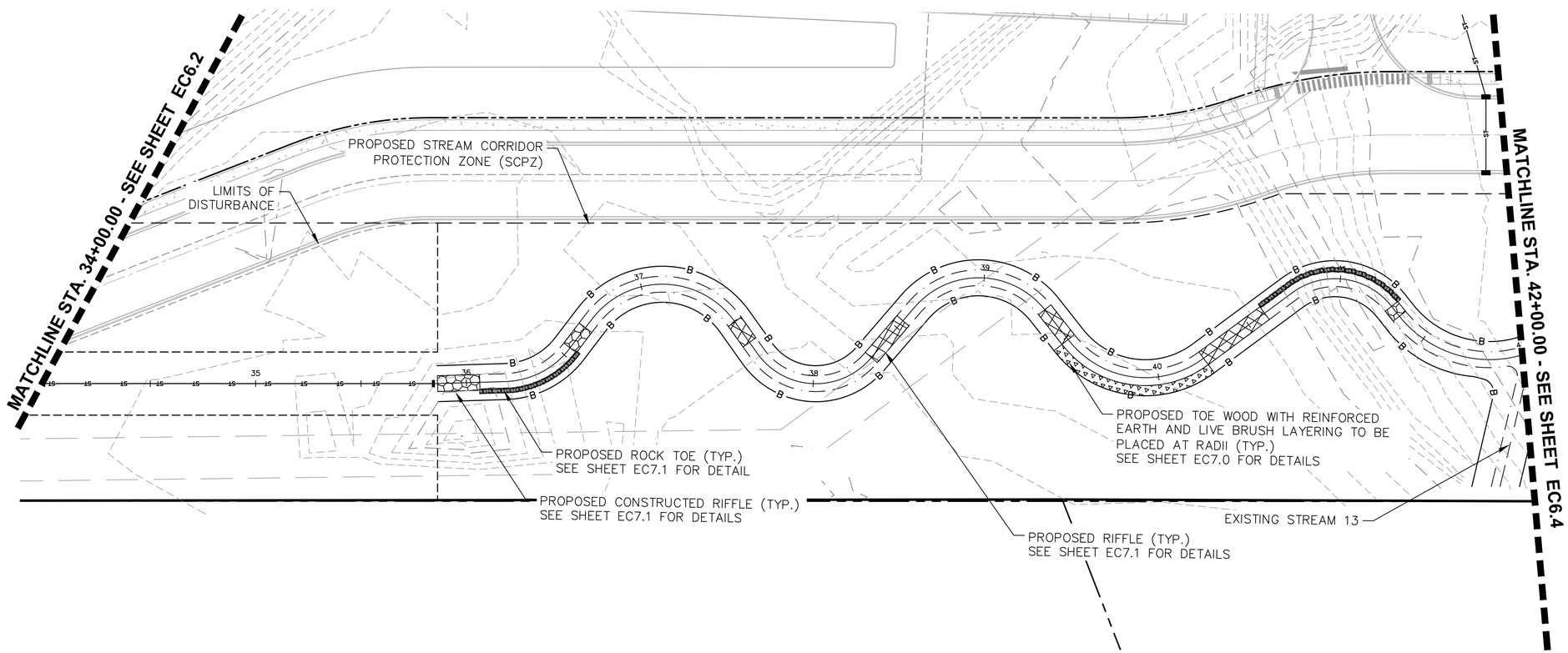

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.3

Drawing name: K:\CLB_LDEV\190118000_Kebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.3 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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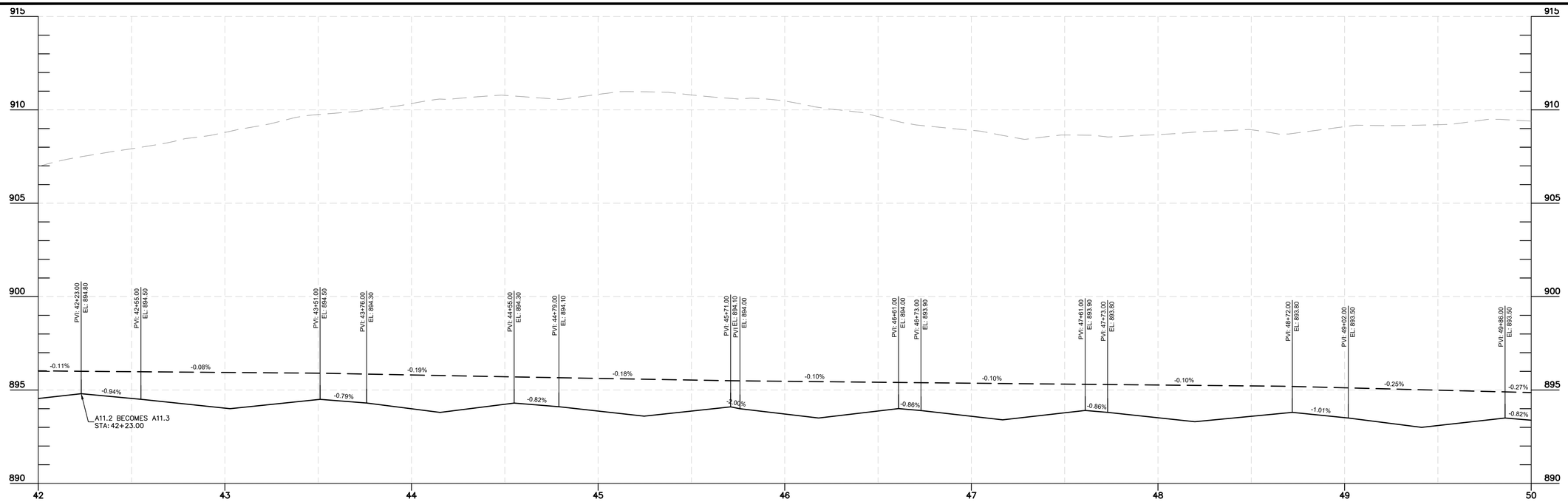

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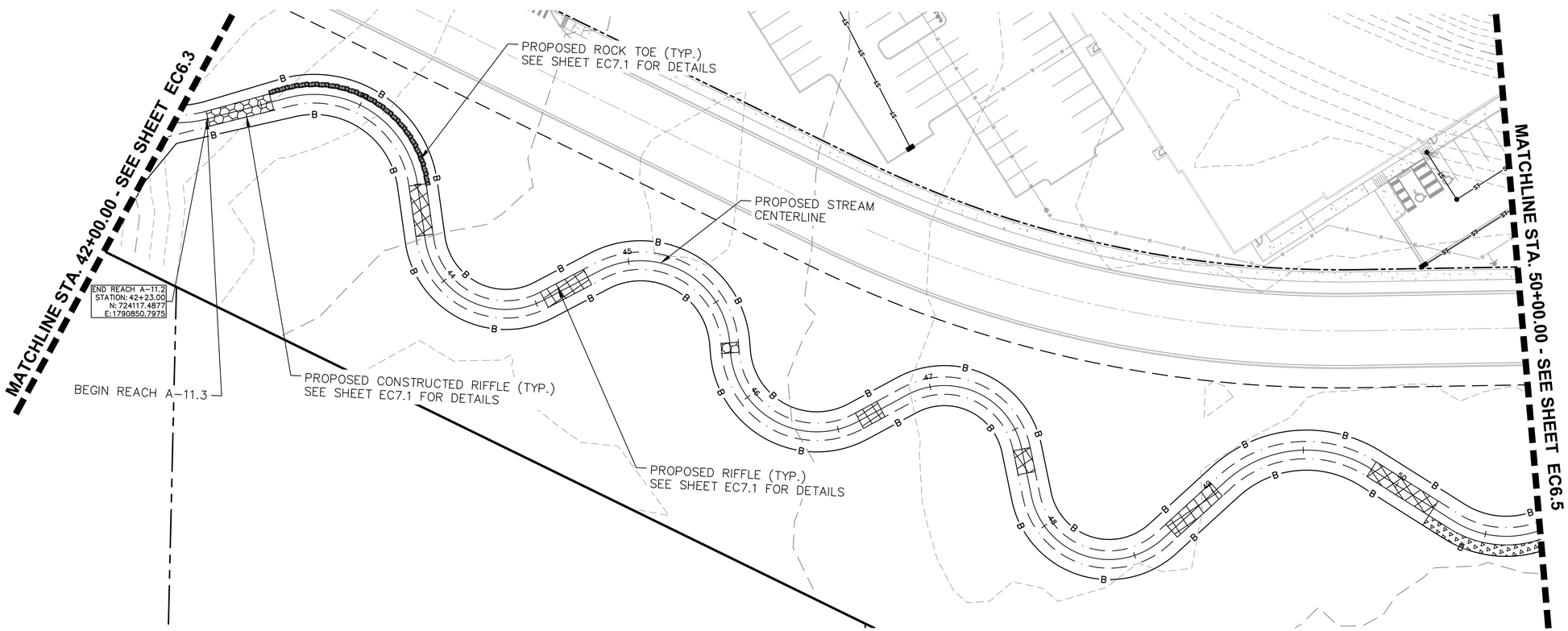

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC6.4

Drawing name: K:\CLB_LDEV\190118000_Kebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE\EC6.4 STREAM PLAN AND PROFILE_A.dwg EC6.4 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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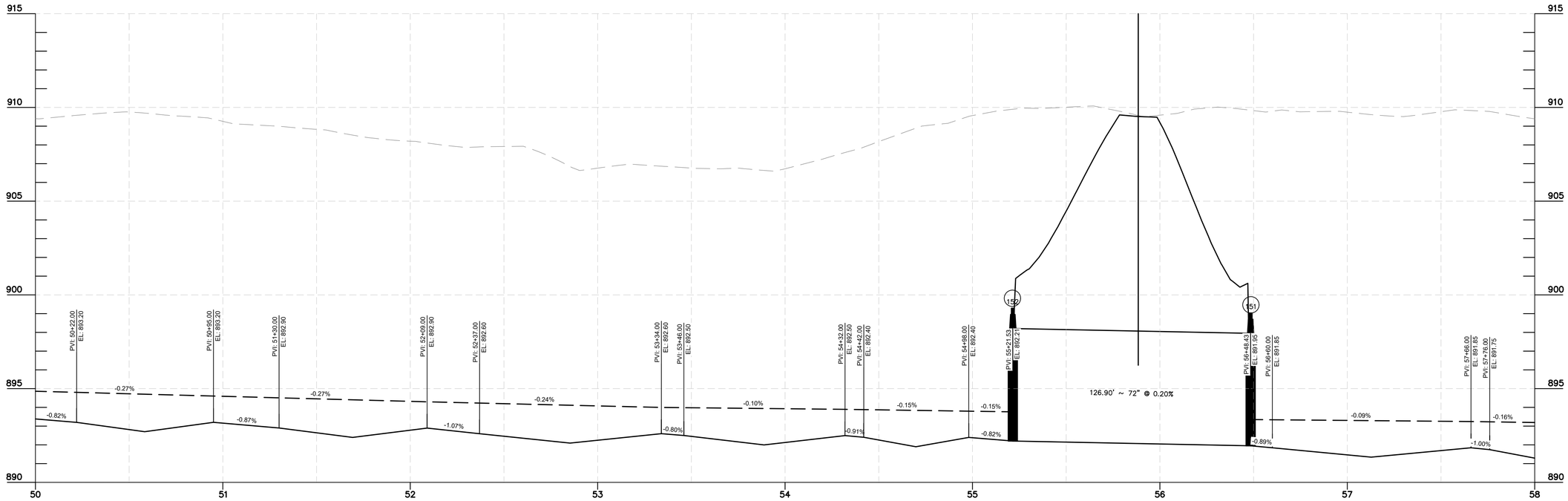

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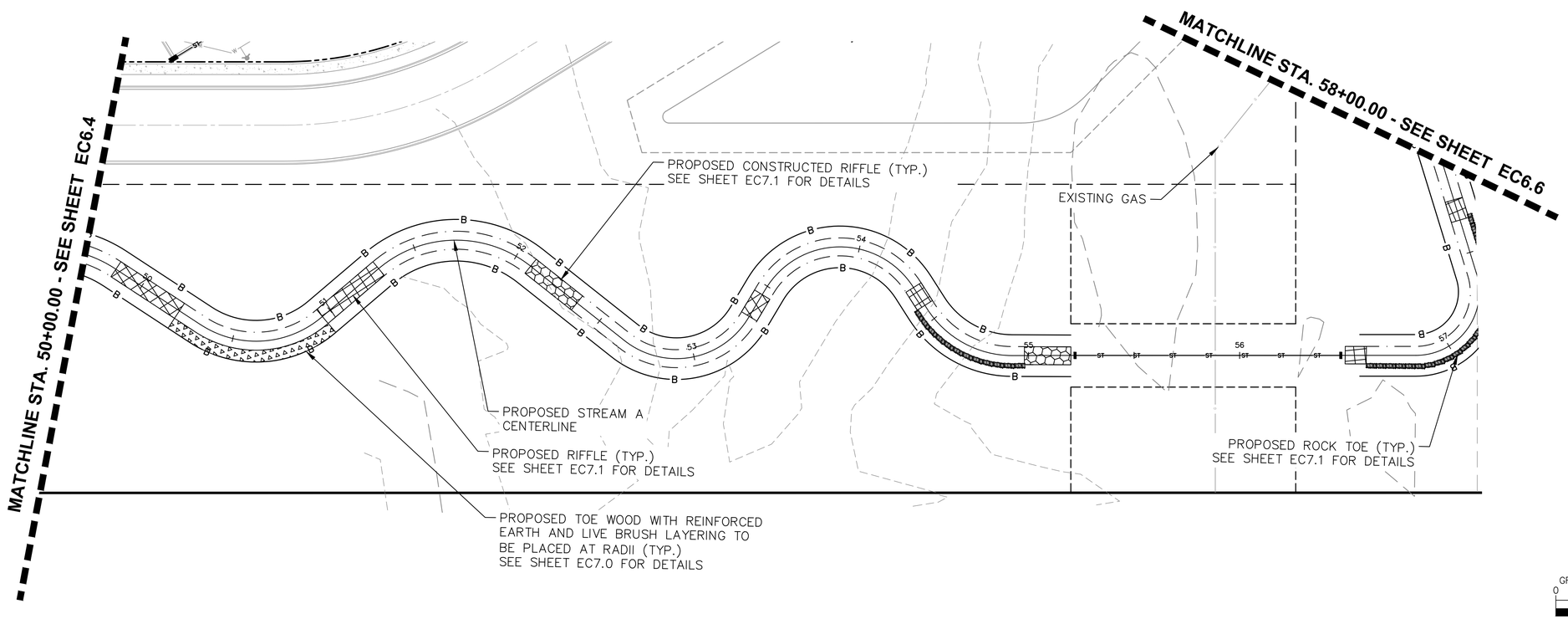

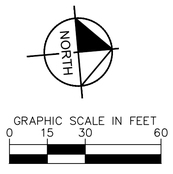

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BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

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10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.5

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.5 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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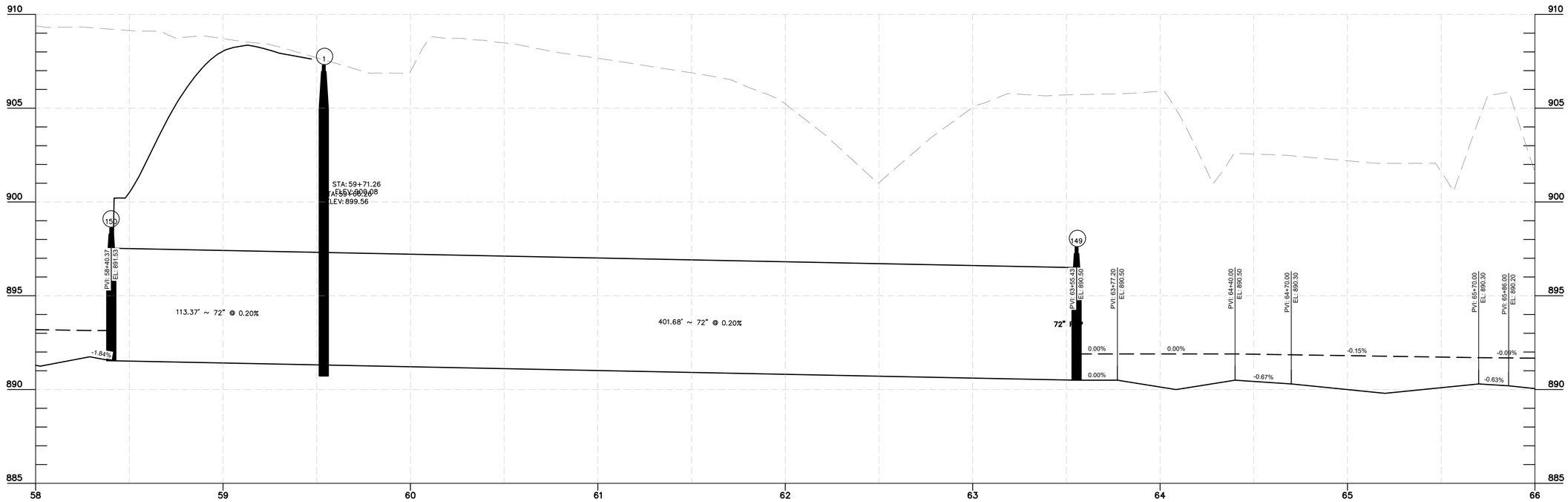

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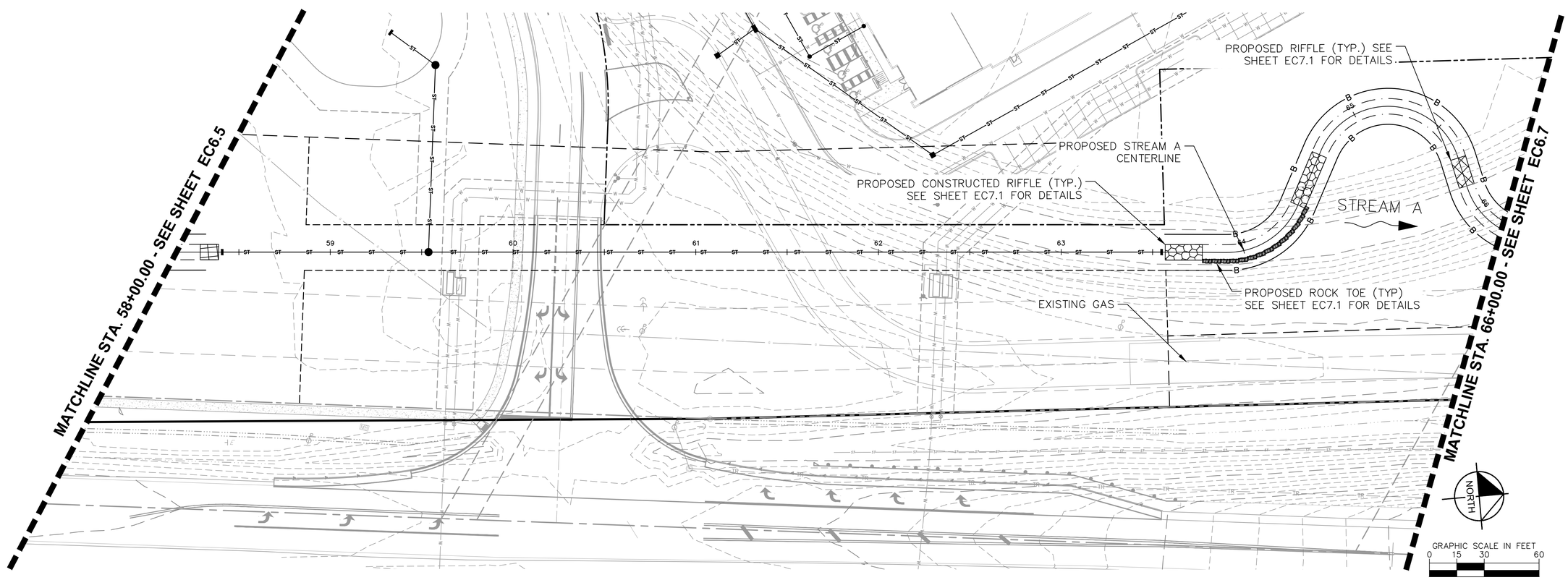

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BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.6

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.6 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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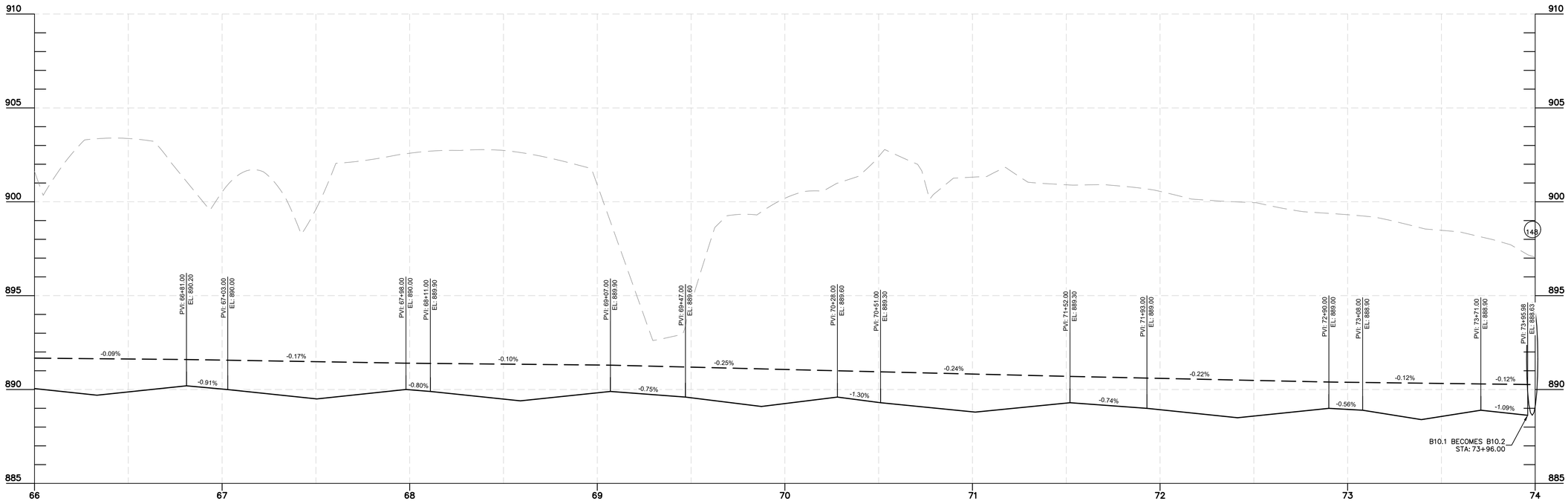

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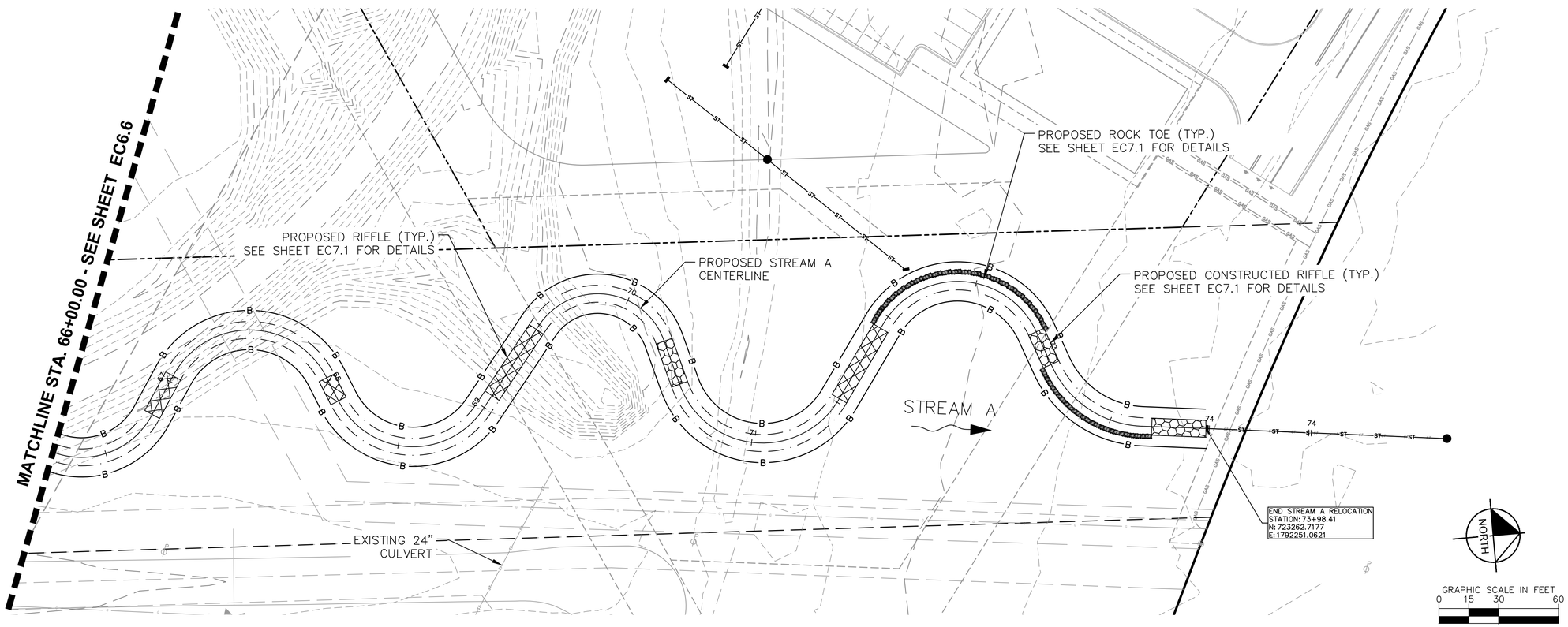

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BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.7

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_A.dwg EC6.7 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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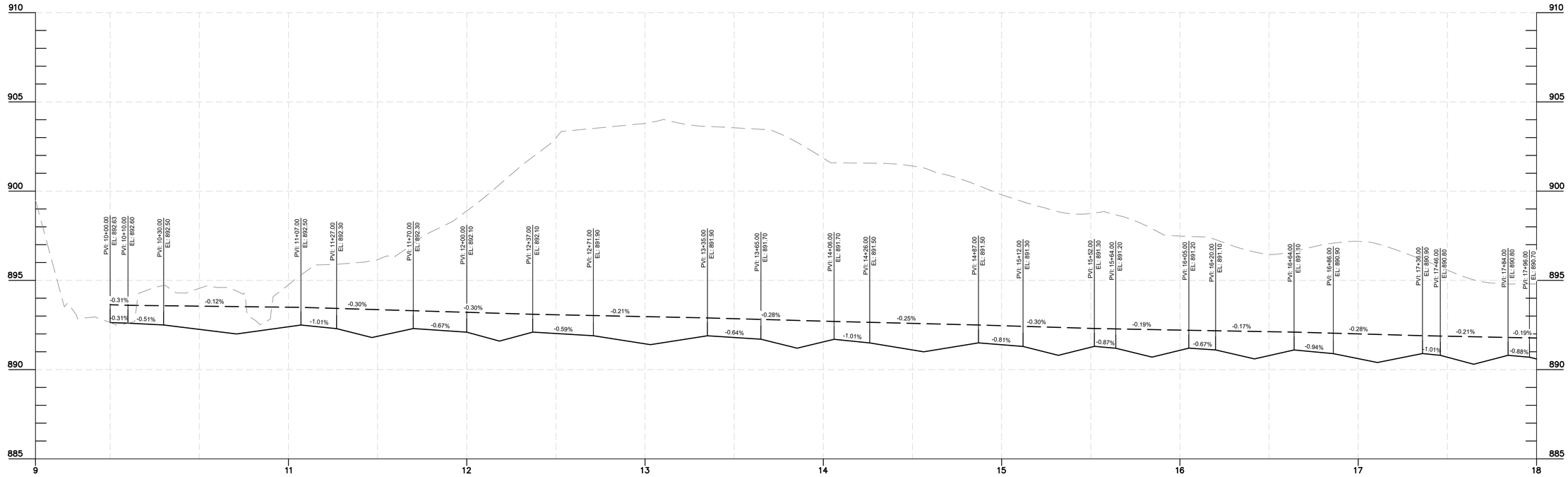

STREAM B
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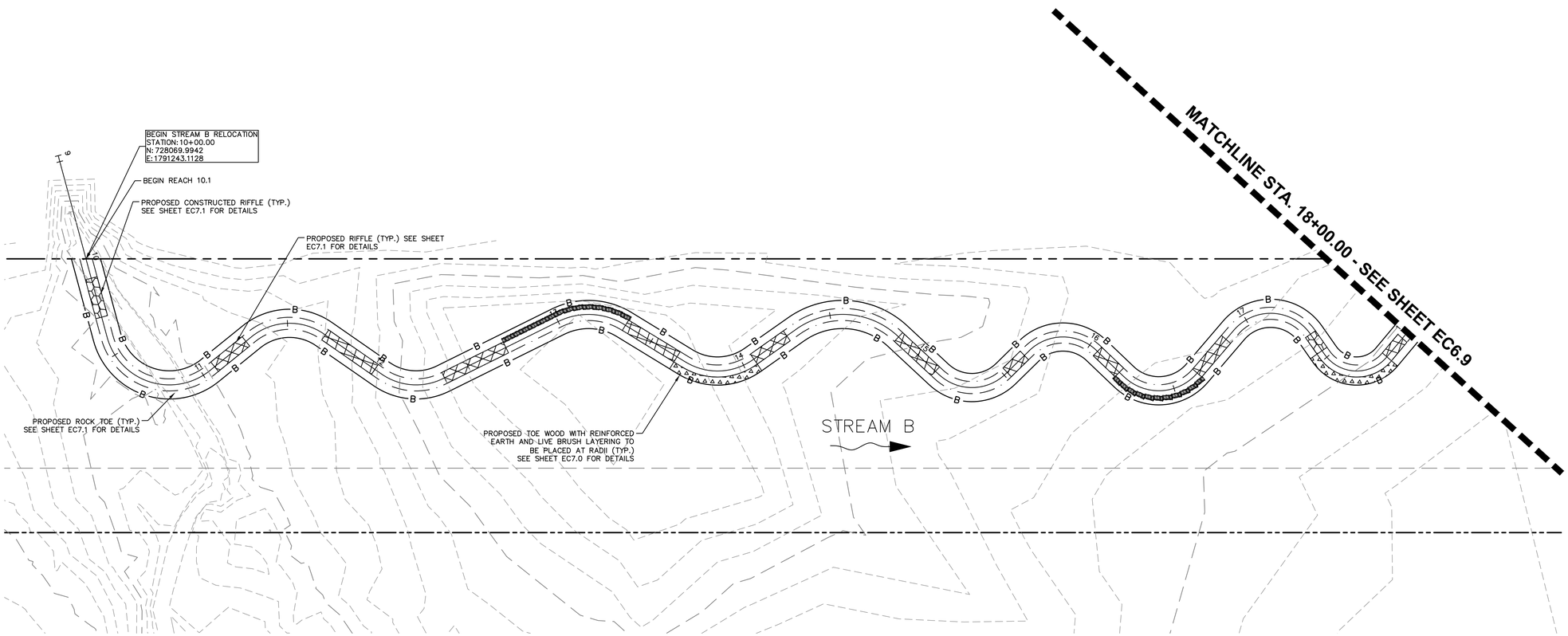

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.8

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_B.dwg EC6.8 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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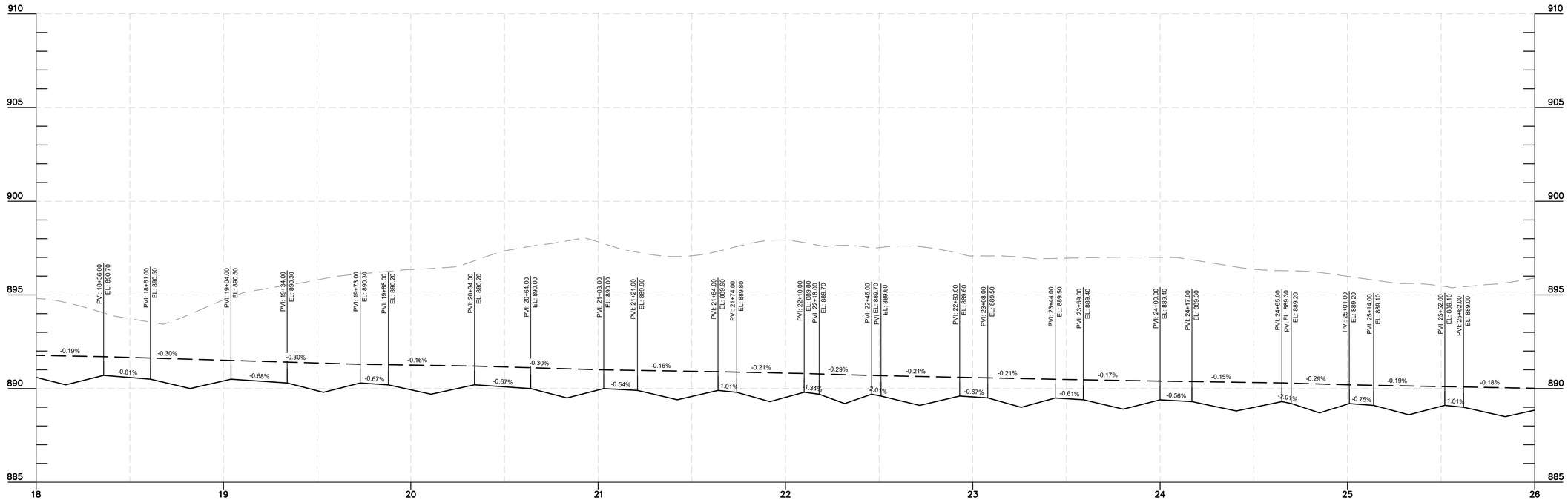

STREAM B
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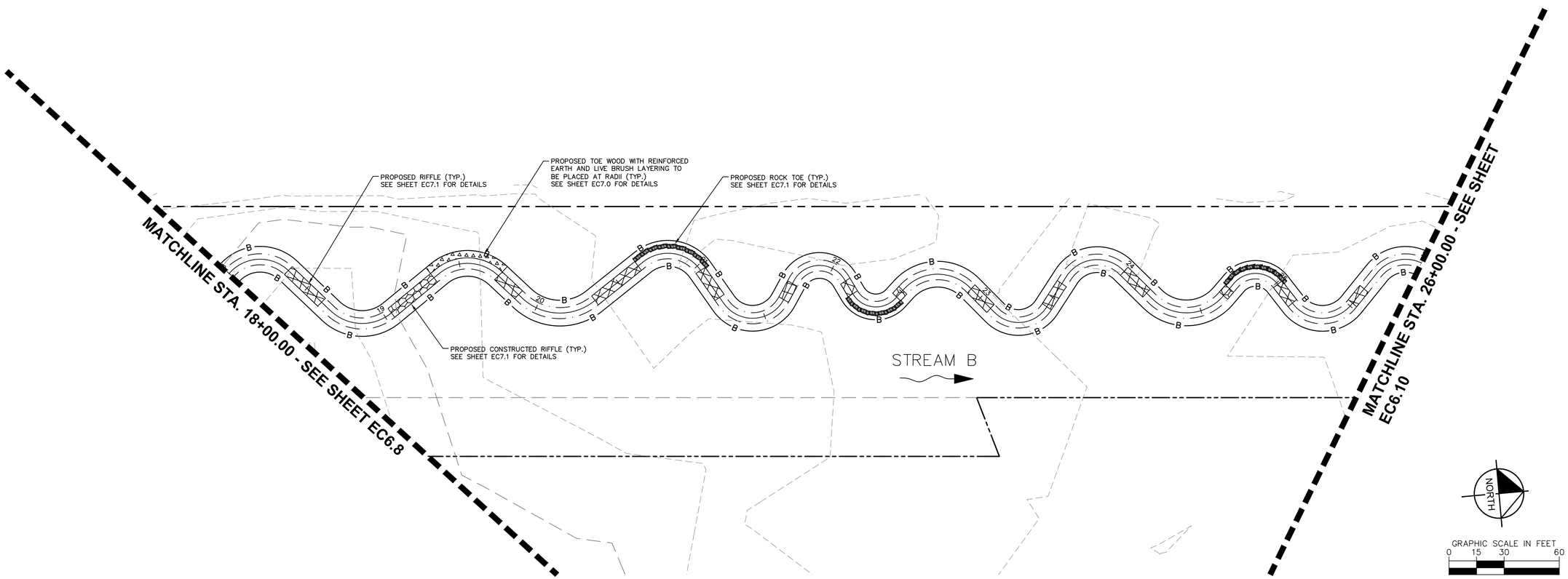

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STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC6.9

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM PLAN AND PROFILE_B.dwg EC6.9 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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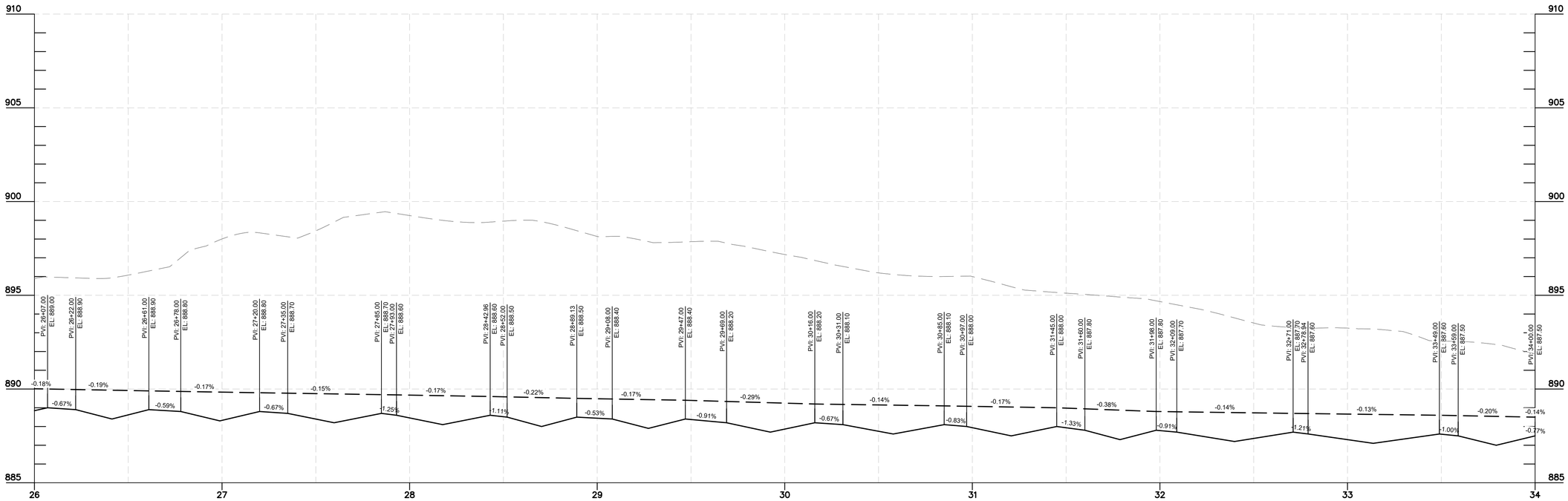

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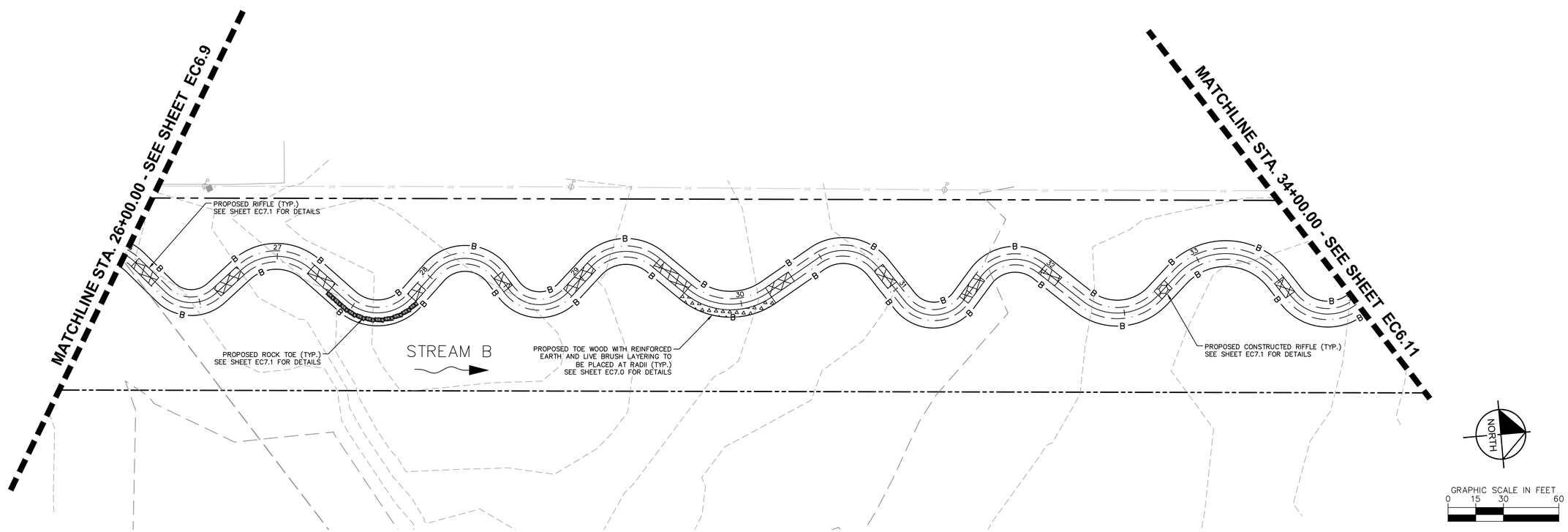

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CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER

EC6.10

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\6_StreamRelocation\STREAM PLAN AND PROFILE_B.dwg EC6.10 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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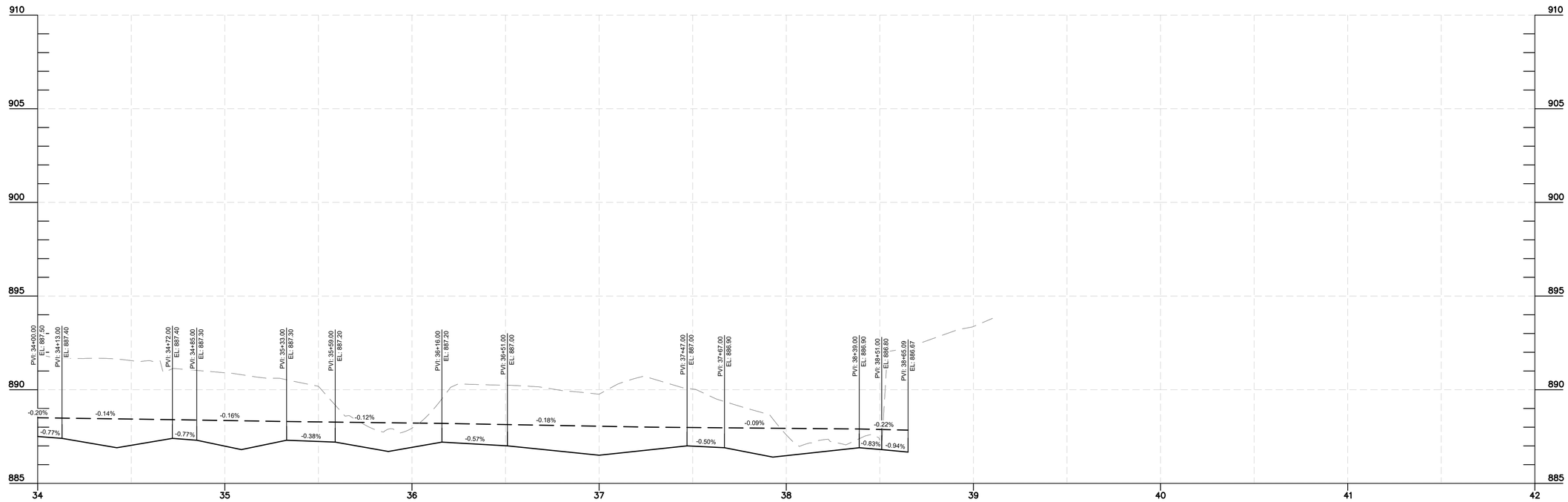

STREAM B
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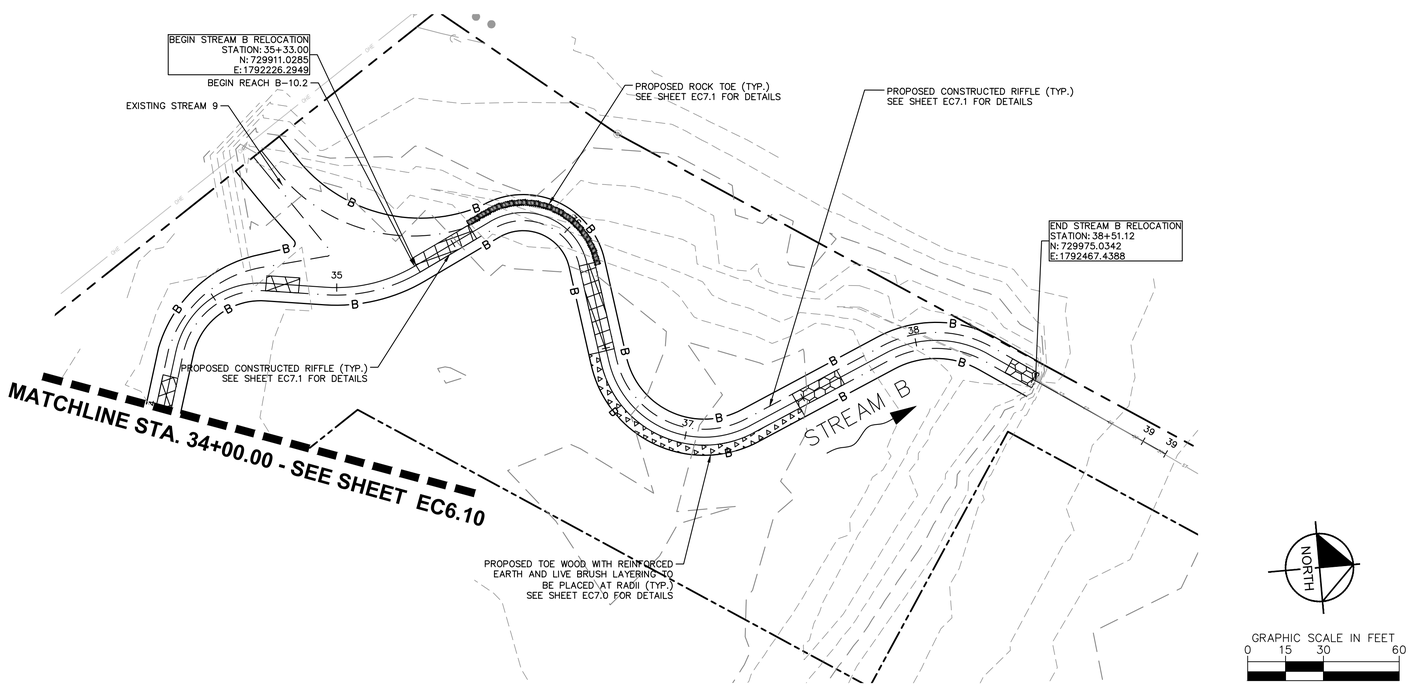

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ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC6.11

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\B_StreamRelocation\STREAM PLAN AND PROFILE_B.dwg EC6.11 STREAM PLAN AND PROFILE Oct 17, 2022 5:00pm by: Gavin.Rivera
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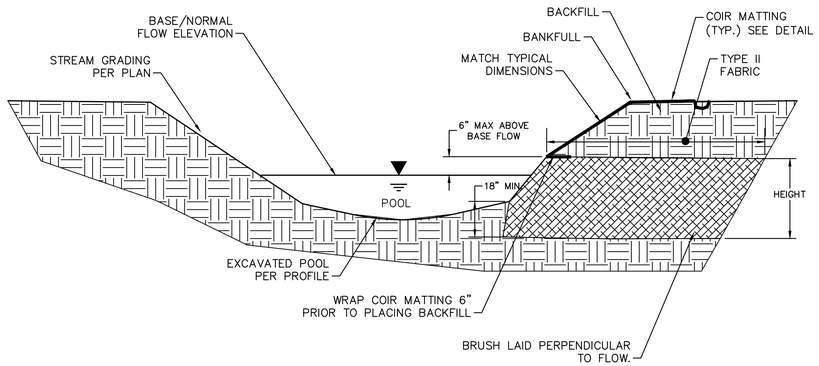
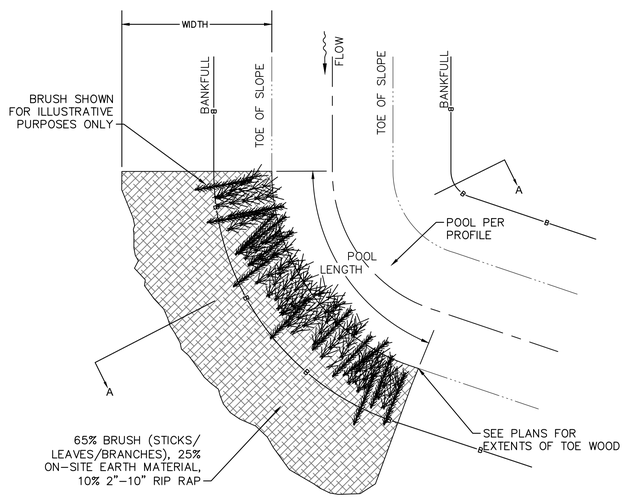


SECTION A-A



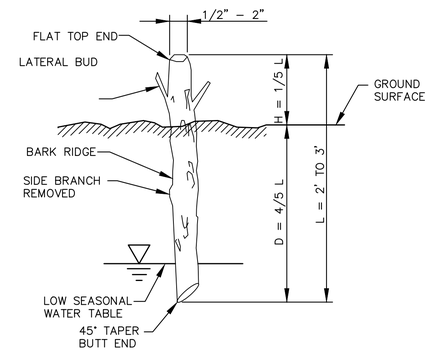
PLAN VIEW

NOTES:

1. BRUSH SHALL BE A VARIETY OF DIAMETERS AND SHALL BE LAID GENERALLY PERPENDICULAR TO FLOW AND COMPACTED BY DIRT.
2. LAYERS SHALL BE 65% BRUSH OF A VARIETY OF SIZES WITH 25% ON SITE MATERIAL FILLING VOIDS AND 10% 2"-10" RIP RAP.
3. BRUSH SHOULD BE BROUGHT UP IN 6"-8" LIFTS.
4. GRADING ABOVE THE TOE WOOD IS PER THE TYPICAL SECTION AND/OR GRADING PLAN.

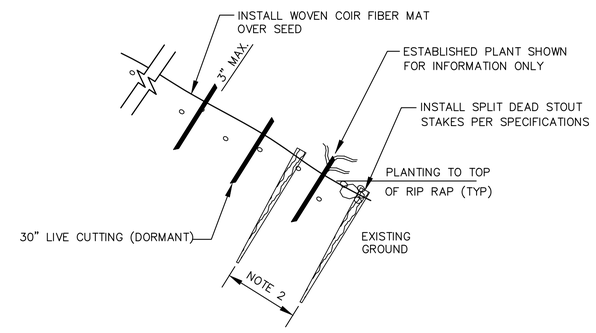
TOE WOOD

NOT TO SCALE



LIVE STAKE DETAIL

NOT TO SCALE



LIVE STAKE (IN EARTH)

NOT TO SCALE

NOTES:
1. IF USING WOVEN COIR FIBER MAT, INSTALL LONG STRAW MULCH BENEATH MAT.
2. 4' ON CENTERS

LIVE STAKING

NOT TO SCALE

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

DETAILS

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC7.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM DETAILS.dwg EC7.0 STREAM DETAILS Oct 17, 2022 5:00pm by: Gavin.Rivera
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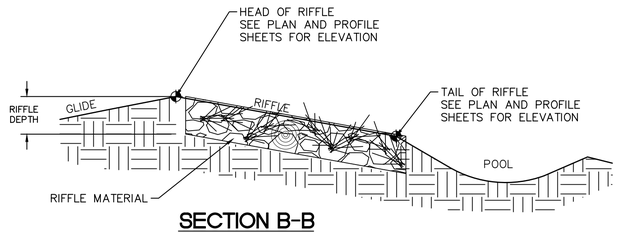
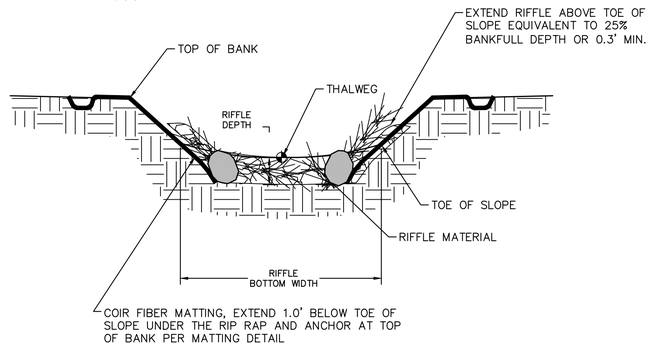
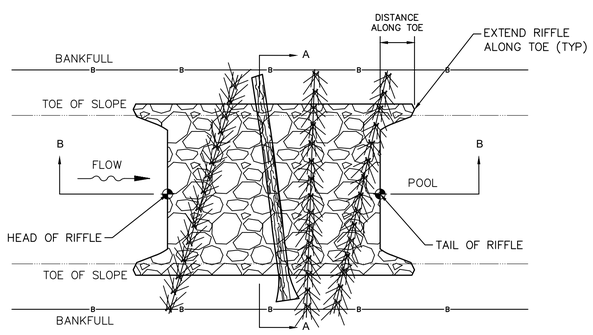


SECTION B-B



SECTION A-A



PLAN VIEW

NOTES:

1. MAJORITY OF BRUSH SHOULD BE 0.5"–2.0" IN DIAMETER AND NO LARGER THAN 6" AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOODY MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.
2. PLACE LOGS AND WOOD DEBRIS WITH MINIMAL GAPS. A LAYER OF ON-SITE CHANNEL MATERIAL SHOULD BE APPLIED TO FILL VOIDS IN BRUSH AND LOGS PRIOR TO THE INSTALLATION OF ADDITIONAL LAYERS.
3. BOULDERS TO BE PLACED AS SPECIFIED ON PLANS

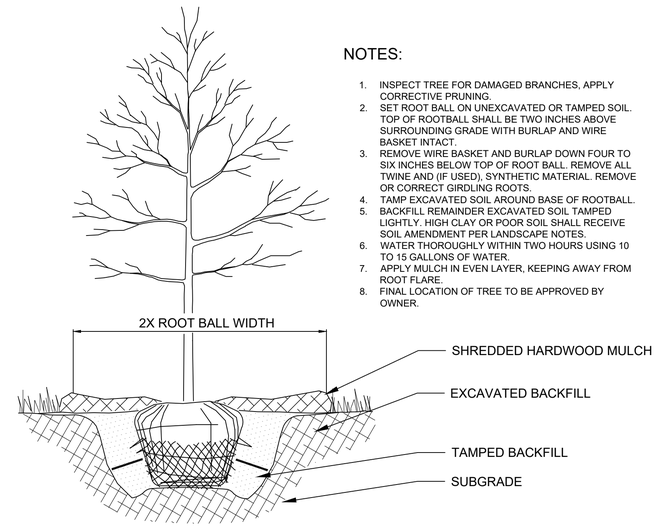
DESIGN VARIABLES	
	ALL REACHES
RIFFLE MATERIAL [1]	B, 57, E, W
RIFFLE DEPTH [2]	12"
RIFFLE BOTTOM WIDTH	VARIES
DISTANCE ALONG TOE	18"
LOG DIAMETER	8" – 12"

[1] WELL MIXED GRADATION (APPROXIMATELY 70% STONE, 20% EARTH AND 10% WOOD/MULCH) STONE MIX TO BE COMPRISED OF THE SPECIFIED MATERIALS: A = CLASS A RIP-RAP, B = CLASS B RIP-RAP, 57 = #57 STONE E = EARTH, M = MULCH, W = WOODY DEBRIS, L = LOGS. #57 STONE NOT TO EXCEED 10% OF THE STONE MIX. THE REMAINDER OF THE MIX SHALL BE EQUAL PARTS CLASS A AND CLASS B RIP-RAP IF BOTH ARE SPECIFIED OR AS DIRECTED BY THE ENGINEER.

[2] DEPTH OF 12" TYPICAL

CONSTRUCTED RIFFLE

NOT TO SCALE

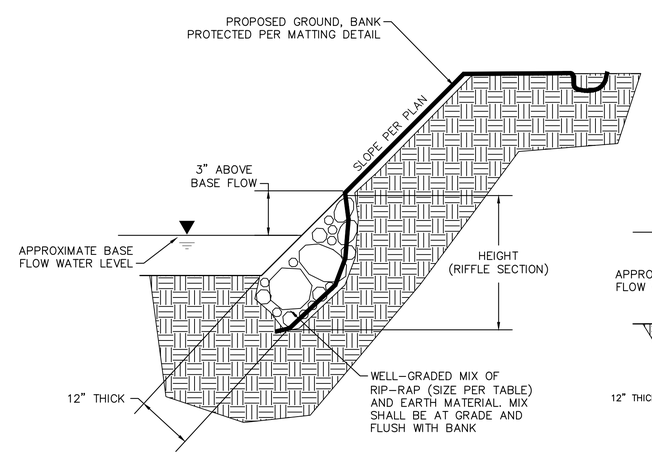


NOTES:

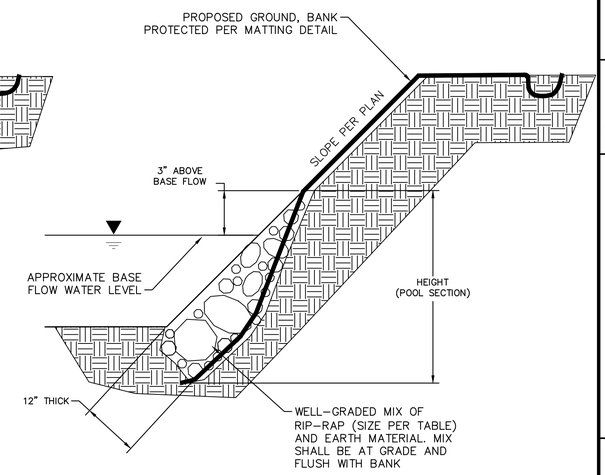
1. INSPECT TREE FOR DAMAGED BRANCHES, APPLY CORRECTIVE PRUNING.
2. SET ROOT BALL ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL SHALL BE TWO INCHES ABOVE SURROUNDING GRADE WITH BURLAP AND WIRE BASKET INTACT.
3. REMOVE WIRE BASKET AND BURLAP DOWN FOUR TO SIX INCHES BELOW TOP OF ROOT BALL. REMOVE ALL TWINE AND (IF USED), SYNTHETIC MATERIAL. REMOVE OR CORRECT GIRDLING ROOTS.
4. TAMP EXCAVATED SOIL AROUND BASE OF ROOTBALL.
5. BACKFILL REMAINDER EXCAVATED SOIL TAMPED LIGHTLY. HIGH CLAY OR POOR SOIL SHALL RECEIVE SOIL AMENDMENT PER LANDSCAPE NOTES.
6. WATER THOROUGHLY WITHIN TWO HOURS USING 10 TO 15 GALLONS OF WATER.
7. APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE.
8. FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.

TREE PLANTING DETAIL

NOT TO SCALE



RIFFLE SECTION



POOL SECTION

NOTES:

1. ROCK TOE TO BE PLACED ON TOP OF COIR MATTING

ROCK TOE PROTECTION

NOT TO SCALE

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DETAILS

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC7.1

Drawing name: K:\CLB_LDEV\190118000_Kebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM DETAILS.dwg EC7.1 STREAM DETAILS Oct 17, 2022 5:00pm by: Gavin.Rivera
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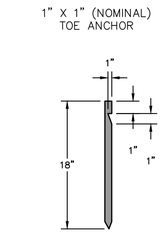
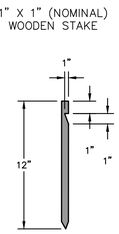


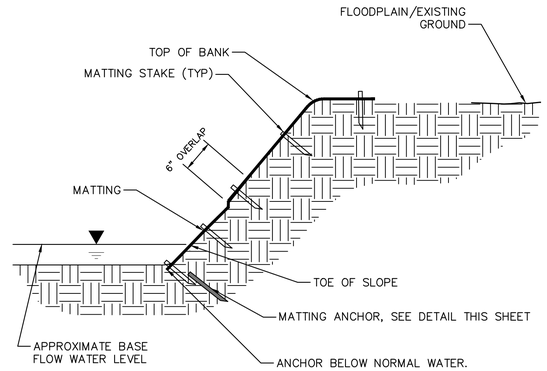
*GALVANIZED NAIL MAY BE USED IN LIEU OF THE NOTCH.

TOE ANCHOR

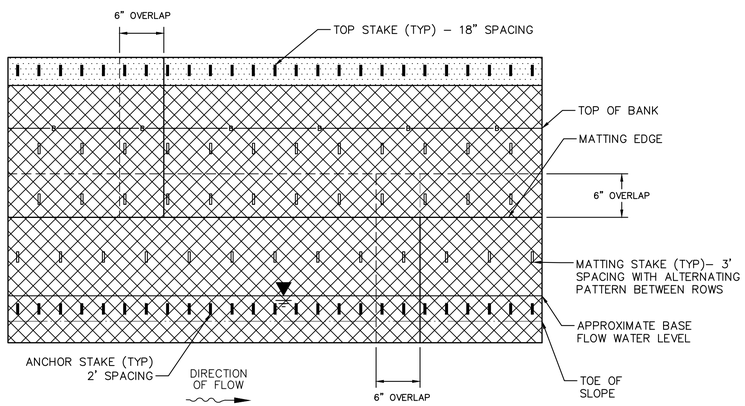


*GALVANIZED NAIL MAY BE USED IN LIEU OF THE NOTCH.

STAKE - OPTION 1



TYPICAL SECTION



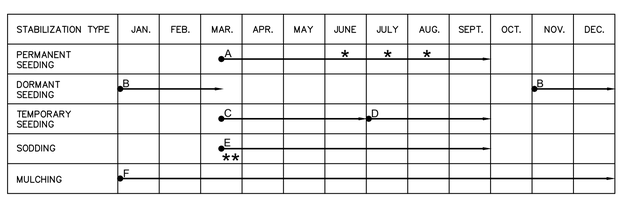
PLAN VIEW

NOTES:

1. THE SLOPE AND/OR STREAM BANK SHALL BE PREPARED (GRADED, TILLED, SMOOTHED, ETC.) AND SEEDED AND MULCHED AS SPECIFIED BY THE DESIGNER PRIOR TO THE PLACEMENT OF THE MATTING.
2. THE MATTING SHALL BE INSTALLED SO AS TO NOT BE IN TENSION, BUT BE PLACED NEATLY, FLUSH AGAINST THE SOIL, AND WITH NO GAPS OR WRINKLES.
3. MATTING SHALL BE NEATLY SECURED AROUND ANY PROJECT STRUCTURES, STRUCTURE ARMS, AND/OR SILLS TO PREVENT ANY LOOSE OR FRAYED EDGES.
4. THERE SHALL BE NO LOOSE ENDS OR UNSECURED MATTING ON THE COMPLETED WORK.

EROSION CONTROL MATTING

NOT TO SCALE



A KENTUCKY BLUEGRASS 90 LBS/ACRE MIXED WITH PERENNIAL RYEGRASS 30 LBS/ACRE

B KENTUCKY BLUEGRASS 135 LBS/ACRE MIXED WITH PERENNIAL RYEGRASS 45 LBS/ACRE + 2 TONS STRAW MULCH/ACRE

C SPRING OATS 100 LBS/ACRE

D WHEAT OR CEREAL RYE 150 LBS/ACRE

E SOD

F STRAW MULCH 2 TONS/ACRE

* WATERING NEEDED DURING JUNE AND JULY

** WATERING NEEDED FOR 2 TO 3 WEEKS AFTER APPLYING SOD

SEEDING CHART

NOT TO SCALE

SPACE INTENTIONALLY LEFT BLANK

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DETAILS

STREAM RELOCATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022

KHA PROJECT NO. 190118000

SHEET NUMBER

EC7.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\8_StreamRelocation\STREAM DETAILS.dwg EC7.2 STREAM DETAILS Oct 17, 2022 5:00pm by: Gavin.Rivera
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Appendix F: SCPZ Reforestation Plan(s)

BUCKEYE XO, LLC

BUCKEYE YARD

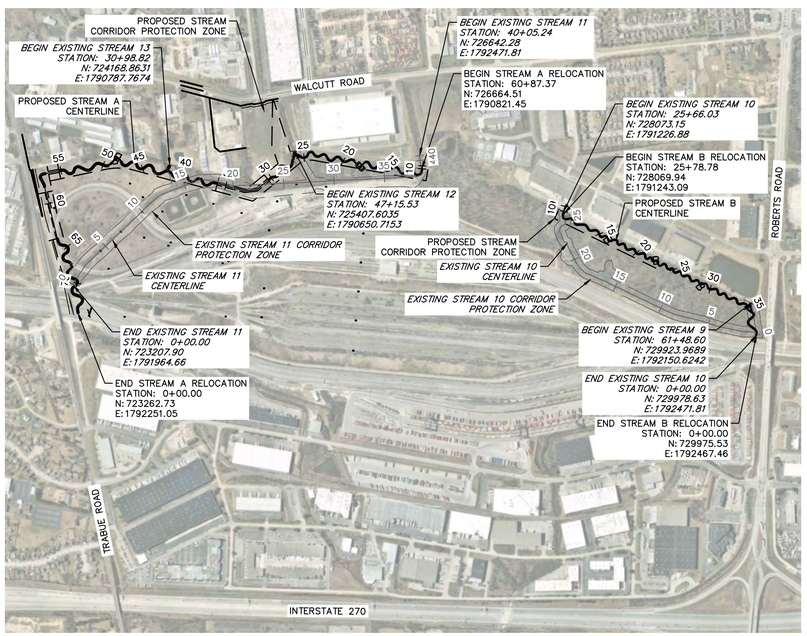
STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS

STATE OF OHIO, FRANKLIN COUNTY

CITY OF COLUMBUS

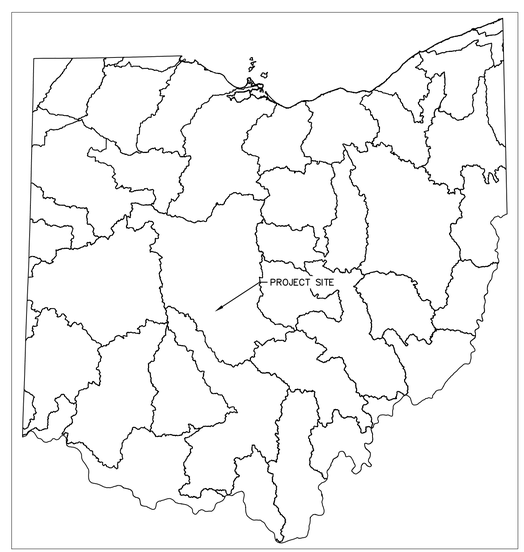
2022

SHEET LIST TABLE	
Sheet Number	Sheet Title
EC0.0	COVER SHEET
EC1.0	GENERAL NOTES
EC2.0	EXISTING CONDITIONS AND TREE REMOVAL PLAN
EC2.1	EXISTING CONDITIONS AND TREE REMOVAL PLAN
EC3.0	PLANTING PLAN OVERVIEW
EC3.1	PLANTING PLAN OVERVIEW
EC3.2	PLANTING PLAN
EC3.3	PLANTING PLAN
EC3.4	PLANTING PLAN
EC3.5	PLANTING PLAN
EC4.0	REFORESTATION PLAN OVERVIEW
EC4.1	REFORESTATION PLAN OVERVIEW
EC4.2	REFORESTATION PLAN
EC4.3	REFORESTATION PLAN
EC4.4	REFORESTATION PLAN
EC4.5	REFORESTATION PLAN
EC5.0	STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE
EC5.1	STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE
EC5.2	STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE
EC5.3	STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE
EC5.4	REFORESTATION – PLANTING LISTS
EC5.5	REFORESTATION– SEED MIXES
EC5.6	REFORESTATION – PLANTING STANDARDS
EC5.7	REFORESTATION– NOTES
EC6.0	DETAILS
EC6.1	DETAILS
EC6.2	DETAILS
EC6.3	DETAILS
EC7.0	WETLAND PLANTING PLAN
EC7.1	WETLAND PLANTING NOTES



SITE LOCATION MAP

GRAPHIC SCALE IN FEET
0 375 750 1500



USGS 8-DIGIT HUC BOUNDARY MAP

UPPER SCIOTO
HUC ID: 05060001
NOT TO SCALE

UPPER PORTION OF EXISTING STREAM 11

LOWER PORTION OF EXISTING STREAM 11

UPPER PORTION OF EXISTING STREAM 10

LOWER PORTION OF EXISTING STREAM 10

PROJECT TEAM

DEVELOPER/OWNER
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2100 ROSS AVE, STE. 895
DALLAS, TX 75201
TEL: (214) 883-0269
CONTACT: DAVIS BITTNER
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COVER SHEET

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\COVER SHEET.dwg Layout1 Oct 17, 2022 5:50pm by: bill.skebba
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GENERAL NOTES:

THE CONTRACTOR SHALL ONLY CONDUCT BANK AND STREAM BED WORK, INCLUDING ALL IN–STREAM, GRADING BANK STABILIZATION, AND IN–STREAM STRUCTURES ON A SECTION OF STREAM THAT CAN BE ENTIRELY STABILIZED BEFORE MOBILIZING TO A NONADJACENT REACH OF PROPOSED CHANNEL IMPROVEMENTS.

EVERY EFFORT SHALL BE TAKEN TO MINIMIZE DISTURBANCE GAINING ACCESS TO/FROM THE WORK AREA.

THE GRADE LINE ELEVATIONS SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED OR FUTURE SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING, ENDING AND AT STRUCTURES AS DIRECTED BY THE DESIGNER IN ORDER TO SECURE A PROPER TIE–IN, SAVE TREES OR TO CREATE A MORE "NATURAL" APPEARANCE. NOTE, FINISHED GRADE ELEVATIONS AS SHOWN IN THE PLANS INCLUDE PLACED TOPSOIL AS DESCRIBED IN THE PLANTING NOTES.

SUBSURFACE:

NO SUBSURFACE DATA IS MADE AVAILABLE TO THE CONTRACTOR FOR THIS PROJECT OTHER THAN THAT PROVIDED IN THE BID MANUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING HIS OWN SUBSURFACE INVESTIGATIONS AS THEY RELATE TO THIS PROJECT.

SITE/EASEMENT:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGED ITEMS DURING CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, EXISTING ROADS, FENCES, SIDEWALKS, LANDSCAPING, CURB AND GUTTER, SEWER LINES, MANHOLES, ETC.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY IMPROVEMENT TO THE ROAD CONDITION, GATES, SIDEWALKS, CURB AND GUTTER, SEWER LINES, MANHOLES AND FENCES, REQUIRED FOR ACCESS DURING CONSTRUCTION.

ANY DRAINAGE TO PUBLIC INFRASTRUCTURE IN THE VICINITY OF THE TEMPORARY CONSTRUCTION ENTRANCE/EXIT SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER. THE TEMPORARY CONSTRUCTION ENTRANCE/EXIT SHALL BE REMOVED AND RETURNED TO THE ORIGINAL CONDITION OR BETTER AT THE END OF USE.

STAGING, STOCKPILES AND HAUL ROAD AREAS:

SPECIFIED AREAS SHOWN ON THE PLANS HAVE BEEN ESTABLISHED AS ACCESS AND STAGING AREAS. THE CONTRACTOR SHALL ESTABLISH STOCKPILE AREAS ALONG THE PROJECT, AS NECESSARY, TO CARRY OUT THE WORK. ALL STOCKPILE AREAS MUST BE INSIDE THE LIMITS OF CONSTRUCTION AND APPROVED BY THE DESIGNER. ADDITIONAL STOCKPILE AREAS SHOULD NOT BE LOCATED WITHIN FORESTED AREAS. SILT FENCE SHALL BE REQUIRED IN AREAS WHERE LOOSE SOIL HAS BEEN PLACED IN THE STAGING AND STOCKPILING AREAS.

EXISTING GRADE ELEVATIONS WITHIN THE 100 YEAR FLOODPLAIN SHALL NOT BE RAISED AS PART OF THIS PROJECT UNLESS SHOWN. ANY EXCESS MATERIAL MUST BE TRANSPORTED OFFSITE TO AN APPROPRIATE DISPOSAL AREA.

MATERIALS:

THE UPPER 6" OF TOPSOIL SHALL BE SAVED FROM THOSE AREAS THAT WILL BE DISTURBED BY EXCAVATION, FILL, HAUL ROADS, OR COMPACTION EQUIPMENT. TOPSOIL SHALL BE KEPT SEPARATE FROM ANY SITE SPOIL. UPON COMPLETION OF CONSTRUCTION, TOPSOIL WILL BE SPREAD OVER AREAS TO BE PLANTED. SEE PLANTING NOTES FOR ADDITIONAL INFORMATION.

STREAM BED MATERIAL, DEEMED SUITABLE BY THE DESIGNER, SHALL BE SAVED FROM AREAS OF THE EXISTING STREAM THAT WILL BE IMPACTED BY CONSTRUCTION. THESE AREAS WILL BE FLAGGED BY THE STREAM DESIGNER PRIOR TO THE CONSTRUCTION OF THE PROPOSED STREAM. EXCAVATED BED MATERIALS, (i.e, GRAVEL ROCK AND COARSE SAND) WILL BE UTILIZED IN CLOSE PROXIMITY TO THEIR LOCATION OF EXCAVATION, AND WILL NOT REQUIRE EXTENSIVE HAULING. THIS EXCAVATED BED MATERIAL WILL BE USED IN THE STREAM'S RIFFLES AND IN–STREAM STRUCTURES.

THE REMAINING EXCAVATED MATERIAL, NOT MENTIONED ABOVE, SHALL BE CONSIDERED SITE SPOIL AND BE STOCKPILED SEPARATELY FROM THE ITEMS LISTED ABOVE. APPROPRIATE AMOUNT OF SUITABLE SITE SPOIL SHALL BE SAVED FOR LATER USE AS BACKFILL.

OTHER SITE SPOIL SHALL BE LEGALLY TRANSPORTED OFFSITE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THIS ACTION IS CONDUCTED UNDER AN EROSION CONTROL PERMIT. THE CONTRACTOR SHALL NOTIFY THE OHIO ENVIRONMENTAL PROTECTION AGENCY BEFORE ANY SPOIL IS TRANSPORTED OFFSITE. CONTRACTOR WILL BE REQUIRED TO INFORM THE LAND QUALITY SECTION OF THE LOCATION AND METHOD OF OFFSITE SPOIL DISPOSAL. ALL PERMITS REQUIRED FOR THE OFFSITE DISPOSAL OF SITE SPOIL IS THE RESPONSIBILITY OF THE CONTRACTOR.

CONSTRUCTION SURVEY:

THE STREAM CENTERLINE, BREAK LINES SHOWN, CUT AND FILL LINES, AND LIMITS OF DISTURBANCE SHOULD BE SET AND STAKED PER THE DRAWINGS. UPON COMPLETION OF THE CONSTRUCTION STAKING THE DESIGNER MUST INSPECT AND APPROVE THE STAKING BEFORE CONSTRUCTION CAN BEGIN. THE DESIGNER RESERVES THE RIGHT TO ADJUST THE LOCATION OF THE PROPOSED STREAM CENTERLINE, BREAKLINES, CUTLINES OR ANY HAUL ROADS.

TREE PROTECTION:

TREES GREATER THAN 6" DBH OUTSIDE THE CUT LINE ARE NOT TO BE REMOVED WITHOUT THE ENGINEER'S APPROVAL, UNLESS THEY ARE MARKED IN THE PLANS.

CONTRACTOR SHALL PREVENT DAMAGE TO TREES TO REMAIN. IN THE EVENT OF DAMAGE, REPAIR ANY DAMAGE TO THE CROWN, TRUNK, OR ROOT SYSTEM IMMEDIATELY.

- REPAIR ROOTS BY CUTTING OFF DAMAGED AREAS AND PAINTING THEM WITH TREE PAINT. SPREAD PEAT MOSS OR MOIST TOPSOIL OVER EXPOSED ROOTS.
- REPAIR DAMAGE TO BARK BY TRIMMING AROUND DAMAGED AREA, TAPER THE CUT TO PROVIDE DRAINAGE, AND PAINT WITH TREE PAINT.
- CUT OFF ALL DAMAGED TREE LIMBS ABOVE THE TREE COLLAR AT THE TRUNK OR MAIN BRANCH. USE A SEPARATE CUT TO AVOID PEELING BARK FROM HEALTHY AREAS OF THE TREE.
- REFER TO THE OEPA GENERAL PERMIT OHC000005 FOR MORE INFORMATION.

TRAFFIC CONTROL:

ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF COLUMBUS DEPARTMENT OF PUBLIC SERVICE MAINTENANCE OF TRAFFIC NOTES. WORK IN THE RIGHT–OF–WAY OR STATE SYSTEM STREETS MAY REQUIRE ADDITIONAL TRAFFIC CONTROL PROVISIONS. REFER TO ODOT WORK ZONE TRAFFIC CONTROL PROGRAM, MUTCD AND ODOT STANDARD DRAWINGS.

EROSION CONTROL:

TOTAL AREA DISTURBED = 24.09 ACRES

SOIL TYPES: URBAN LAND–CELINA COMPLEX, CROSBY SILT LOAM, KOKOMO SILTY CLAY LOAM

INSTALLATION OF SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH STATE EROSION CONTROL REGULATIONS.

THE CONTRACTOR SHALL INSTALL AND MAINTAIN THROUGHOUT THE PROJECT CONSTRUCTION ALL EROSION CONTROL MEASURES SHOWN WITHIN THESE PLANS IN ACCORDANCE WITH APPLICABLE NCDEQ EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACTOR MAY ADJUST LOCATION OF HAUL ROADS AND SILT FENCE AS NECESSARY AFTER SUCH PROPOSED CHANGES HAVE BEEN APPROVED BY THE DESIGNER.

ALL CONSTRUCTION WORK SHALL BE IN COMPLIANCE WITH REGULATIONS OF THE NATIONAL AND STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER GENERAL PERMIT.

CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING A RAIN GAUGE ON THE PROJECT SITE AND FOR RECORDING DAILY RAINFALL AMOUNTS DURING CONSTRUCTION.

SILT FENCE SHOULD BE LOCATED BETWEEN THE HAUL ROAD AND STREAM WHERE HAUL ROADS ARE LOCATED NEAR A SECTION OF STREAM THAT WILL NOT BE WORKED ON AS PART OF THIS PROJECT.

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED CONTINUOUSLY, RELOCATED WHEN AND AS NECESSARY, AND SHALL BE CHECKED FOR MAINTENANCE ISSUES AFTER EVERY RAINFALL. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH THE LOCAL OR OEPA SO THAT PERIODIC INSPECTIONS CAN BE PERFORMED AT APPROPRIATE STAGES OF CONSTRUCTION.

STABILIZATION IS THE BEST FORM OF EROSION CONTROL. SEEDED AREAS SHALL BE CHECKED REGULARLY AND SHALL BE WATERED, FERTILIZED, RESEEDED AND MULCHED AS NECESSARY TO OBTAIN A DENSE STAND OF GRASS. ALL DISTURBED AREAS THAT ARE NOT OTHERWISE STABILIZED SHALL BE TOP SOILED AND SEEDED, TEMPORARILY OR PERMANENTLY IN ACCORDANCE WITH THE OEPA GENERAL PERMIT OHC000005. PERMANENT SEEDING AND GRASS ESTABLISHMENT IS REQUIRED PRIOR TO PROJECT COMPLETION AND ACCEPTANCE.

CONTRACTOR SHALL PROVIDE GROUND STABILIZATION ON PERIMETER AREAS AND EXPOSED SLOPES GREATER THAN 3:1 WITHIN 7 DAYS AND WITHIN 14 DAYS IN ALL OTHER AREAS. CONTRACTOR TO LIMIT CLEARING TO 1,000 LF PRIOR TO COMPLETING BANK GRADING AND/OR STABILIZATION. LIMIT REMOVAL OF TREE STUMPS PRIOR TO INITIATION OF BANK GRADING.

ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 21 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.

CONTRACTOR SHALL KEEP ALL SURROUNDING PUBLIC ROADWAYS AND DRAINAGE SYSTEMS FREE FROM DIRT, MUD, AND CONSTRUCTION DEBRIS AT ALL TIMES. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT ALL ACCESS LOCATIONS PER THE PLANS AND SPECIFICATIONS. WHEN A CRUSHED STONE CONSTRUCTION ENTRANCE HAS BEEN COVERED WITH SOIL OR HAS BEEN PUSHED INTO THE SOIL BY CONSTRUCTION TRAFFIC, IT SHALL BE REPLACED WITH A DEPTH OF STONE EQUAL TO THAT OF THE ORIGINAL APPLICATION.

ALL DRAINAGE INLETS SHALL BE PROTECTED FROM SILTATION. INEFFECTIVE PROTECTION DEVICES SHALL BE IMMEDIATELY REPLACED AND THE INLET CLEANED. FLUSHING IS NOT AN ACCEPTABLE METHOD OF CLEANING.

DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL TEMPORARY SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

ALL HAUL ROAD LOCATIONS ONSITE MAY BE ADJUSTED IN THE FIELD TO PROTECT EXISTING TREES LARGER THAN 6" DBH. THE FINAL STAKING OF THE HAUL ROADS SHALL BE APPROVED BY THE DESIGNER BEFORE CLEARING COMMENCES.

CONTRACTOR SHALL ONLY CROSS STREAM AT STABILIZED CROSSINGS AS SHOWN IN PLANS. CONTRACTOR TO COORDINATE WITH OEPA IF ADDITIONAL CROSSINGS ARE NEEDED.

SEDIMENT BASINS AND TRAPS, PERIMETER DIKES, TEMPORARY SILT CHECK DAMS, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND–DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.

STABILIZATION MEASURES SHALL BE APPLIED TO STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL EROSION CONTROL MEASURES NOT SHOWN ON THE PLANS BUT NECESSARY TO CONTROL EXCESS SEDIMENT, IF DETERMINED TO BE NECESSARY BY THE DESIGNER.

GENERAL SEQUENCE:

THE CONTRACTOR SHALL CONSTRUCT NEW CHANNEL SECTIONS TO A STABLE FORM BEFORE MOVING OUT OF THE WORK AREA. A STABLE FORM SHALL INCLUDE, BUT IS NOT LIMITED TO THE COMPLETE INSTALLATION OF IN STREAM STRUCTURES, EROSION CONTROL MATTING, AND TEMPORARY VEGETATION.

PERMANENT VEGETATION SHALL BE INSTALLED IN CONJUNCTION WITH TEMPORARY SEEDING IF CONSTRUCTION IS PERFORMED DURING THE SEASON SPECIFIED IN THE DRAWINGS AND SPECIFICATIONS. PERMANENT VEGETATION SHALL BE INSTALLED DURING SPECIFIED PLANTING SEASONS.

CONSTRUCTION SEQUENCE:

1. STAKE THE STREAM PER SPECIFICATIONS..
2. THE CONTRACTOR SHALL INSTALL THE EROSION CONTROL MEASURES. THE CONTRACTOR SHALL CLEAR ONLY AS NECESSARY TO INSTALL THESE ITEMS, AND SHALL NOTIFY THE PROJECT ENGINEER WHEN INSTALLATION OF THESE ITEMS IS COMPLETE FOR INSPECTION BY THE LOCAL EROSION CONTROL INSPECTOR.
3. WHERE PROPOSED CHANNEL GRADING IS TO BE PERFORMED, EXCAVATE AND STORE DESIGNATED TOPSOIL, CHANNEL BED MATERIAL, AND TREES THAT CAN BE UTILIZED FOR CONSTRUCTION OF IN–STREAM STRUCTURES, INCLUDING LOG VANES, JOG J–HOOKS, LOG RIFFLES, AND TOE WOOD. CLEAR THE LOGS, BRUSH, TREES AND SHRUBS INSIDE THE CUT LINES. NO TREES OUTSIDE OF THE DESIGNATED AREAS OF EXCAVATION GREATER THAN 6" DBH ARE TO BE REMOVED WITHOUT DESIGNER'S APPROVAL. SHRUBS AND TREES THAT ARE TO BE TRANSPLANTED SHALL BE MARKED. THESE SHRUBS AND TREES SHALL BE SAVED FOR TRANSPLANTING AND STOCKPILED. ALL SHRUBS AND TREES MARKED TO BE TRANSPLANTED SHALL BE REMOVED ENSURING THAT THE ROOT MASS IS INTACT.
4. CONSTRUCTION SHALL BE COMPLETED INCLUDING TEMPORARY VEGETATION, EROSION CONTROL MATTING, LIVE STAKING, MATERIAL TRANSPLANTS (INCLUDING BED MATERIAL), AND STRUCTURES. THESE SHALL BE APPROVED BY THE DESIGNER PRIOR TO DIVERTING STREAM FLOWS INTO THE NEW CHANNEL.
5. THE CONTRACTOR SHALL STABILIZE THE SITE AS AREAS ARE BROUGHT UP TO FINISHED GRADE.
6. INSTALL PLANTINGS ACCORDING TO THE PLANTING PLANS.

UTILITIES:

THE CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES INSIDE THE CONSTRUCTION CORRIDOR.

UNDERGROUND UTILITIES TO BE TRAVERSED BY CONSTRUCTION EQUIPMENT SHALL BE APPROPRIATELY PROTECTED OR BRIDGED TO PREVENT DAMAGE. THE CONTRACTOR SHALL FURNISH ALL PROTECTION CROSSINGS REQUIRED FOR ALL UTILITY CROSSINGS. PROTECTION CROSSINGS SHALL BE INSTALLED AS REQUIRED TO PROTECT EXISTING UTILITIES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO ANY UTILITY LINES DURING THE CONSTRUCTION PROCESS.

THE CONTRACTOR SHALL FOLLOW OSHA GUIDELINES AND UTILITY OWNER GUIDELINES WHEN WORKING NEAR UTILITIES.

THE CONTRACTOR SHALL CALL THE "OHIO811" BY DIALING 811 OR 1–800–362–2764 BEFORE DIGGING.

PLANTING NOTES

THE PLANTING SHOULD BE COMPLETED ACCORDING TO THE PLAN AND SPECIFICATIONS THAT ARE IN THE CONSTRUCTION DOCUMENTS. ANY SPECIFICATIONS CAN BE MODIFIED OR ADJUSTED BY KIMLEY–HORN DEPENDING ON THE SITE–SPECIFIC CONDITIONS OR AVAILABILITY OF PLANS.

PLANTS MAY REQUIRE ADDITIONAL CARE AFTER THE COMPLETION OF 1 GROWING SEASON (MID–APRIL TO LATE OCTOBER). STANDARD PRACTICES SUCH AS WATERING, MULCHING, AND FERTILIZER SHOULD BE COMPLETED DURING THIS TIME AS NECESSARY.

PLANT SPECIES CAN BE SUBSTITUTED IF THE SPECIFIED PLANTS ARE NOT AVAILABLE, BUT MUST BE APPROVED BY ENGINEER.

ALL SEEDS/VEGETATION SHALL ENSURE THAT THE ORIGIN OF THE SEEDS FROM WHICH THE PLANTS OR SEEDS WERE PRODUCED FROM HARDINESS ZONES 5, 6, OR 7, FROM THE EASTERN OR CENTRAL PORTIONS OF THE U.S., PRIOR TO PLANTING.

AN EXPERIENCED CONTRACTOR WHO HAS SUCCESSFULLY COMPLETED PLANTING PROJECTS SIMILAR IN SIZE SHALL BE HIRED FOR THE WORK.

A FULL TIME AND EXPERIENCED SUPERVISOR SHALL BE ON THE PROJECT SITE WHEN PLANTING IS IN PROGRESS.

STOCK FURNISHED SHALL BE AT LEAST THE MINIMUM SIZE INDICATED. LARGER STOCK IS ACCEPTABLE AS LONG AS QUALITY AND VARIETY IS MAINTAINED AND DOES NOT PRESENT PROBLEMS WITH THE INSTALLATION PROCESS.

ENSURE THAT THE ROOTS.ROOT BALLS ARE PROTECTED FORM DIRECT SUN, BREAKAGE, WARM AIR AND DRYING WINDS. STOCK IN CONTAINERS SHALL BE WATERED FREQUENTLY TO KEEP SOIL MOIST. DRIED OUT TOPS OF PLANTS OR ROOTS SHALL BE REJECTED.

ALL PLANT MATERIAL SHALL BE TRANSPORTED AND STORED TO PREVENT PHYSICAL DAMAGE.

ROOT STOCK TO BE PRUNED AS NECESSARY BEFORE INSTALLATION.

DO NOT BEND OR BIND–TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DESTROY THEIR NATURAL SHAPE. USE PROTECTIVE COVERING ON PLANS DURING DELIVERY.

IF PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY, SET PLANT MATERIALS IN SHADE TO PROTECT FROM MECHANICAL OR WEATHER DAMAGE.

PROTECT BARK, BRANCHES, AND ROOT SYSTEMS FROM SUN SCALD, DRYING, SWEATING, DESTRUCTIVE WINDS AND OTHER TYPES OF DAMAGE.

PLANTING NOTES (CONTINUED)

PLANTINGS SHOULD FOLLOW DETAILS ON SHEETS EC7.0 TO EC7.3. A PUNCH/PLANTING BAR, AUGER, REBAR, OR WATER–JET MAY BE USED TO PRE–DRILL HOLES IF NECESSARY. SOIL AROUND STAKE SHOULD BE TAMPED FOLLOWING INSTALLATION.

SHRUB SEEDLINGS AND BARE ROOT TREE PLANTINGS ARE PERMITTED BETWEEN THE NOVEMBER 1 AND DECEMBER 15, AND FEBRUARY 15 TO APRIL 15. THESE DATES CAN ONLY BE CHANGED WITH ADVANCED APPROVAL BY KIMLEY–HORN. IF PLANTED OUTSIDE THESE DATES, THE CONTRACTOR BARES RESPONSIBILITY FOR THE SURVIVAL OF THE PLANTINGS.

ALL BARE ROOT PLANTS SHALL BE SET STRAIGHT OR PLUMB TO ALLOW UPRIGHT GROWTH. CONTAINERIZED PLANTS SHALL BE SET PLUMB AND CENTERED WITHIN THE HOLE, WHILE MAKING SURE THAT ROOT BALL IS ELEVATED 2 TO 3 INCHES ABOVE THE SURROUNDING SOIL ELEVATIONS. THE PLANTING HOLES SHALL BE BACKFILLED WITH THE SAME SOIL THAT WAS EXCAVATED FORM THE HOLE AFTER REMOVING ALL STONES, ROOTS AND OTHER DEBRIS GREATER THAN 2 INCHES IN DIAMETER. AFTER BACKFILLING THE HOLE, ALL PLANTED SPECIES SHOULD BE WATERED TO THE POINT OF SOIL SATURATION IF NOT PLANTED IN AN EXISTING WET CONDITION.

MAKE SURE THAT ROOTS ARE NOT POT BOUND AND SEPARATE ANY CRAMPED ROOTS BEFORE SETTING THE PLANT.

ENSURE THAT EXISTING SOIL AROUND THE PLANTING IS NOT MOUNDED AND RAKE TO EVEN SOIL OUT AS NECESSARY.

ANY LIVE STAKES USED SHALL BE AT LEAST 1 YEAR OLD AND HARVESTED AND TRANSPORTED WHEN THE PLANS ARE DORMANT (NOV. 1 TO MARCH 1). REFER TO LIVE STAKE DETAIL IN PLANS.

VERIFY THE ELEVATIONS OF THE SUBGRADE AND TOPSOIL AND VERIFY THE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED.

COMPACTED SOIL SHALL BE RAKED, DUSTED, OR ADJUSTED AS NECESSARY TO FACILITATE WATER INFILTRATION AND ROOT GROWTH.

ANY SOIL ADJUSTMENTS SHALL BE COMPLETED PRIOR TO SEEDING AND PLANT INSTALLATION. DO NOT START INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN A MANNER ACCEPTABLE TO THE ENGINEER.

ANY ROCK FRAGMENTS LARGER THAN 2 INCHES IN SIZE, OR LARGE DEBRIS SHALL BE REMOVED BEFORE ANY PLANTING INSTALLATION. ADEQUATE SOIL FOR PLANTING SHOULD BE COMPRISED MAINLY OF LOAM TO SILTY CLAY LOAM SOILS.

PLANTS SHALL BE INSTALLED IN UNFROZEN SOIL CONDITIONS (OCTOBER 1 TO DECEMBER 15, OR MARCH 1 TO MAY 31) AND OUTSIDE OF POTENTIAL FROST. PLANT INSTALLATION OUTSIDE OF THIS TIME PERIOD SHALL NOT OCCUR UNLESS APPROVED BY THE ENGINEER AND MAY REQUIRE ADDITIONS TO THE SCOPE OF WORK, SUCH AS WATERING REGIMES, MULCHING, OR ADDITIONAL PLANT QUANTITIES.

SEEDING SHALL OCCUR FORM FALL (SEPTEMBER 1) TO LATE SPRING (MAY 31). WEEDING AND SOIL PREPARATION CAN BE CONDUCTED AS NEEDED PRIOR TO SEEDING AND PLANTING.

WET SEED, MOLDY SEED, OR DAMAGED SEED SHALL NOT BE USED. SEED SHOULD BE CLEAN AND DRY.

USE STRAW MULCH IMMEDIATELY FOLLOWING COMPLETION OF SEEDING OPERATIONS IF OTHER EROSION CONTROL MEASURES ARE NOT OTHERWISE SPECIFIED.

RAKE SEED LIGHTLY INTO THE TOP $\frac{1}{4}$ TO $\frac{1}{2}$ INCH OF TOPSOIL, ROLL LIGHTLY AND WATER WITH A SPRAY.

No.	REVISIONS	DATE	BY	APR DATE	APR BY

Kimley»Horn
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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

GENERAL NOTES

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC1.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\GENERAL NOTES.dwg Layout1 Oct 17, 2022 5:50pm by: bill.skebba
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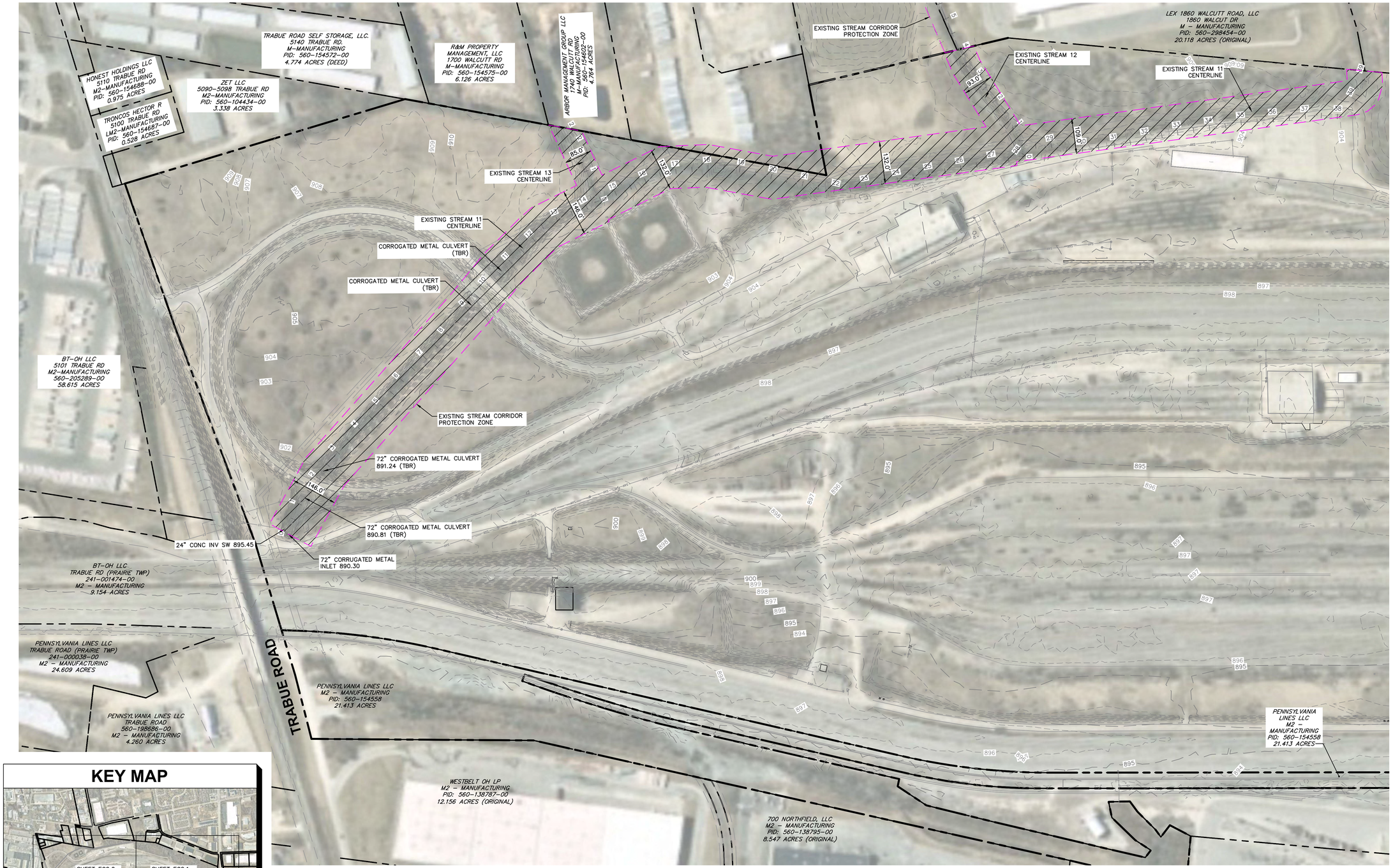
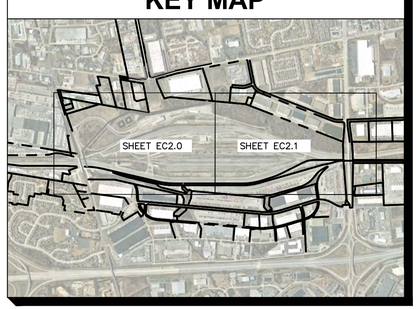


KEY MAP



LEGEND

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- EXISTING ELECTRIC
- EXISTING STREAM CORRIDOR PROTECTION ZONE
- LIMITS OF TREES TO BE REMOVED

NORTH

GRAPHIC SCALE IN FEET
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EXISTING CONDITIONS AND TREE REMOVAL PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
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CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
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Drawing name: K:\CLB_LDEV\190118000_Kebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\EXISTING CONDITIONS AND TREE REMOVAL PLAN.dwg OVERVIEW A Oct 17, 2022 5:50pm by: bill.skebba
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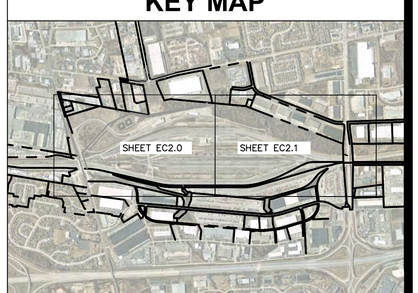

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EXISTING CONDITIONS AND TREE REMOVAL PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\3_StreamReforestation\EXISTING CONDITIONS AND TREE REMOVAL PLAN.dwg OVERVIEW B Oct 17, 2022 5:50pm by: billi.skebba
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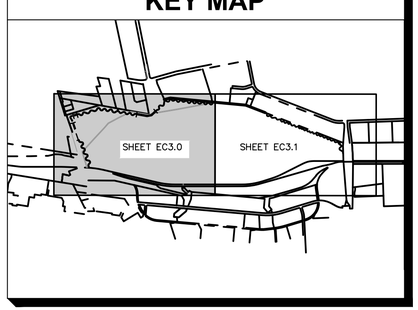

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- PROPOSED RIGHT–OF–WAY
- PROPOSED STORM
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- LIVE STAKE PLANTING (3.88 AC.)
- UPPER SHORELINE PLANTING (11.56 AC.)
- UPLAND PLANTING (5.99 AC.)

NORTH

GRAPHIC SCALE IN FEET
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PLANTING PLAN OVERVIEW

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

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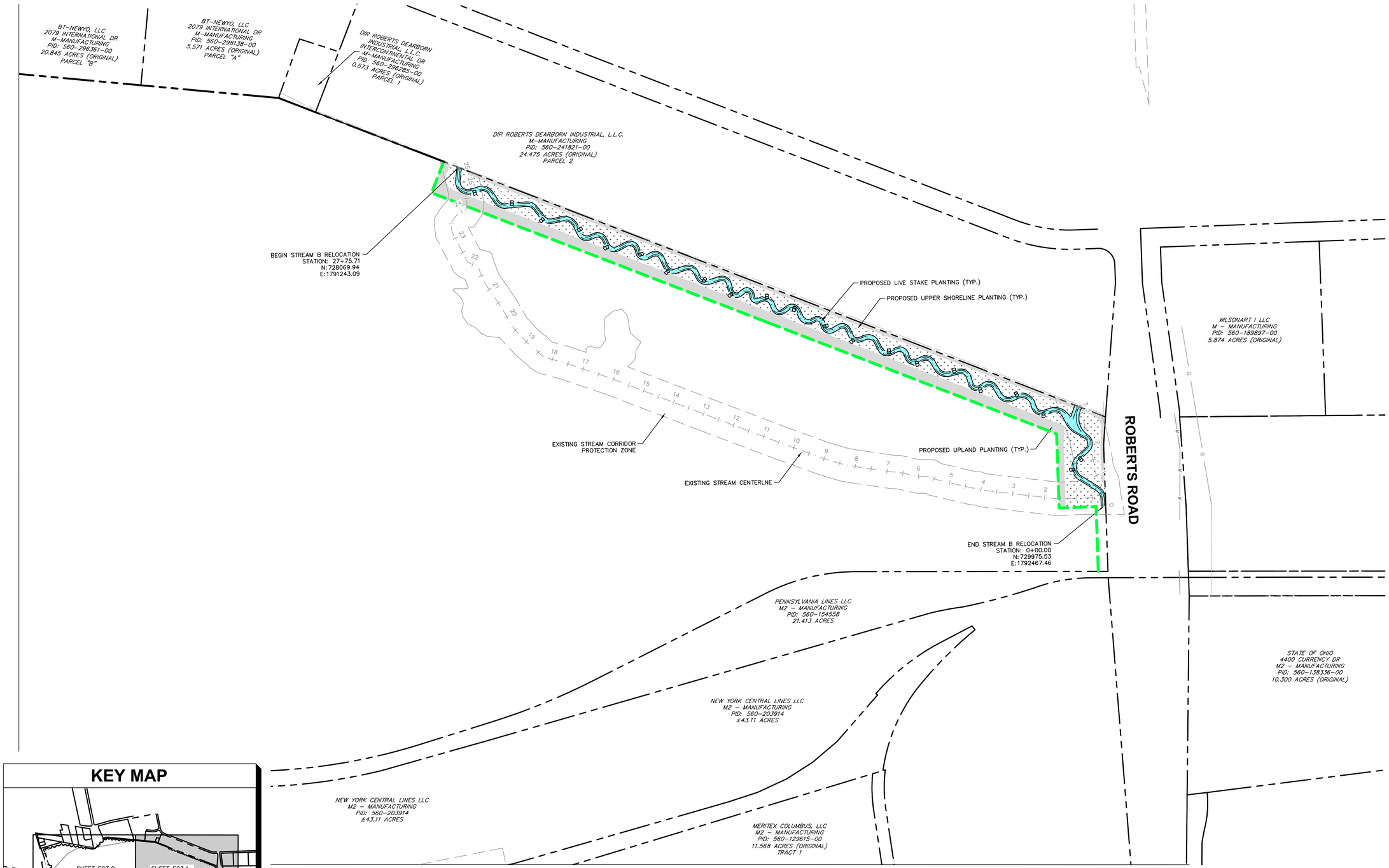

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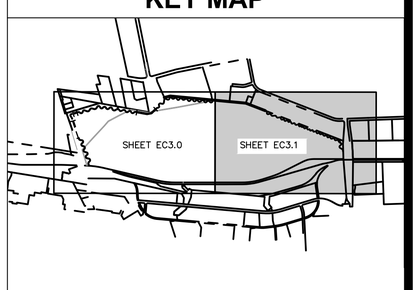

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PLANTING PLAN OVERVIEW

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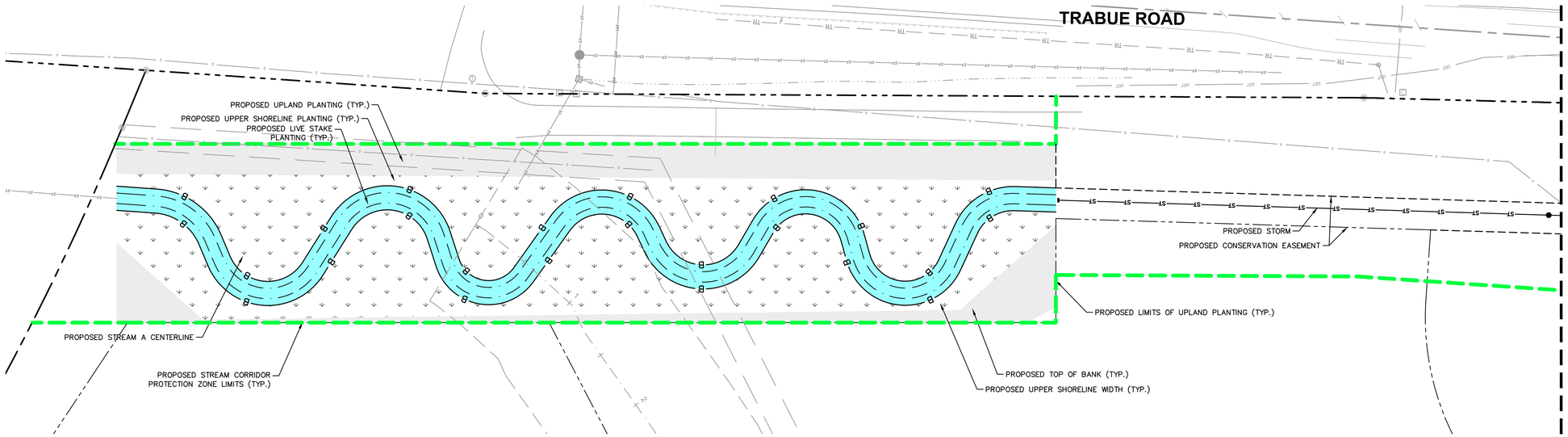

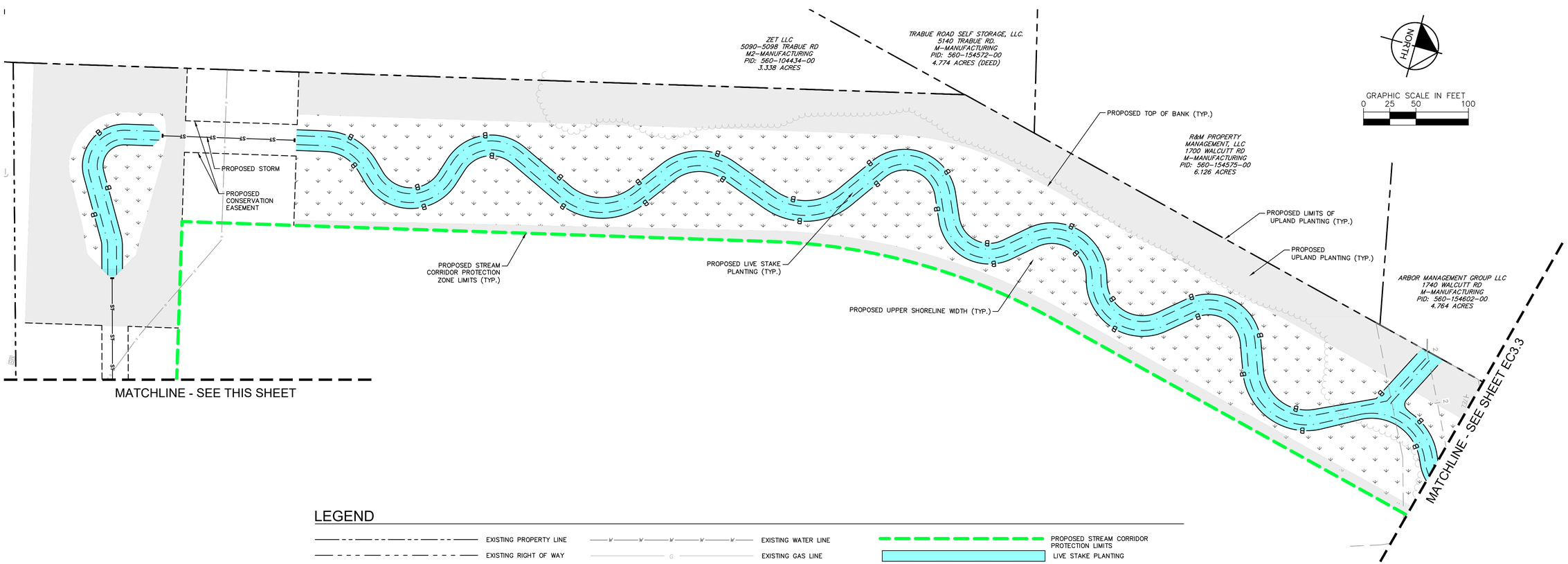

LEGEND

EXISTING PROPERTY LINE	EXISTING WATER LINE
EXISTING RIGHT OF WAY	EXISTING GAS LINE
EXISTING EASEMENT	EXISTING OVERHEAD LINE
EXISTING PAVEMENT	EXISTING ELECTRIC
EXISTING CENTERLINE	PROPOSED RIGHT-OF-WAY
EXISTING STORM	PROPOSED STORM
EXISTING SANITARY	

- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- LIVE STAKE PLANTING
- UPPER SHORELINE PLANTING
- UPLAND PLANTING

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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SCALE:
DESIGNED BY: MCS
DRAWN BY: MCS
CHECKED BY: JMM

PLANTING PLAN

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\PLANTING PLAN.dwg STREAM A - 1 Oct 17, 2022 5:50pm by: bill.skebba
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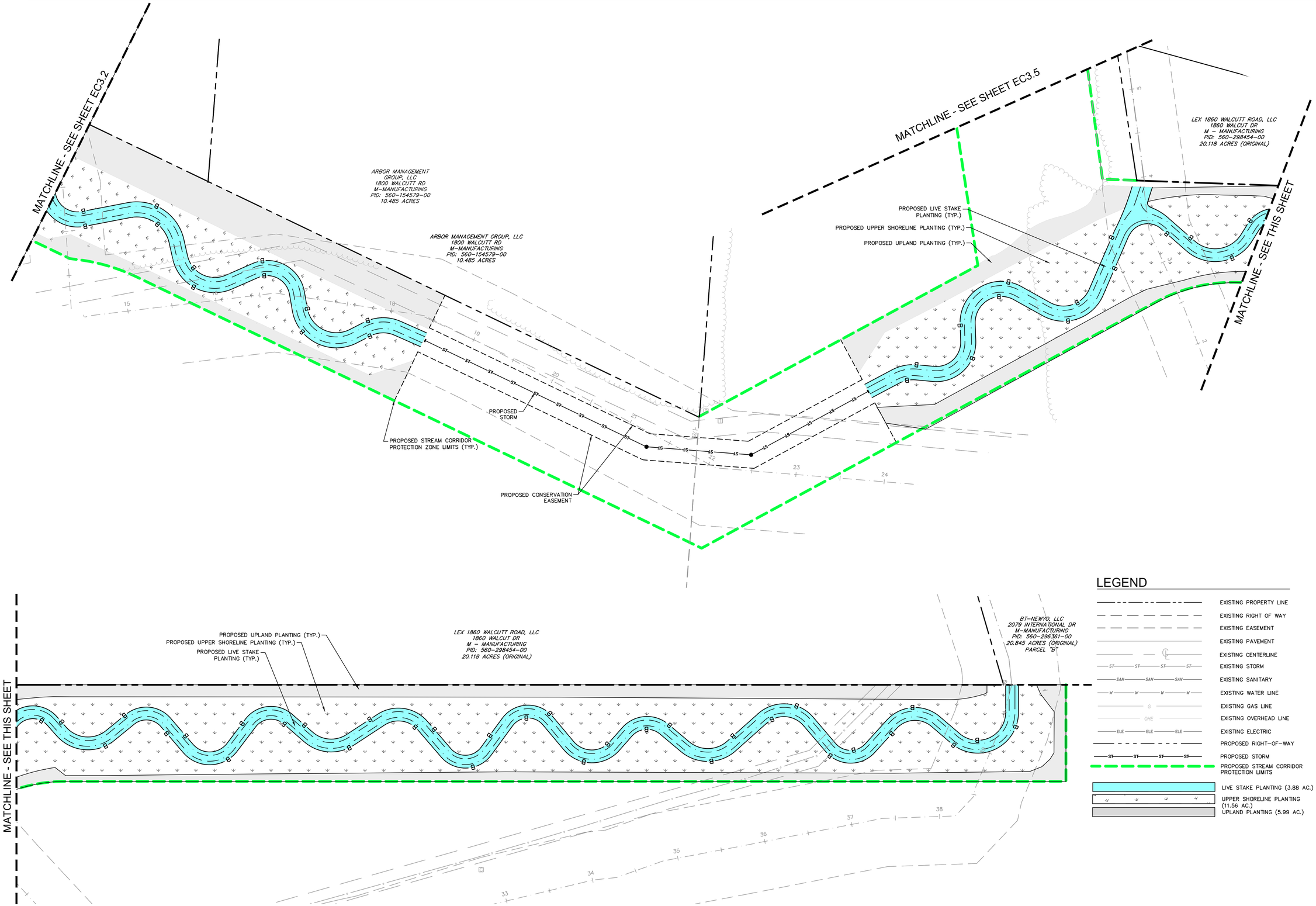

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SCALE:

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PLANTING PLAN

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022

KHA PROJECT NO. 190118000

SHEET NUMBER

EC3.3

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\PLANTING PLAN.dwg STREAM A - 2 Oct 17, 2022 5:50pm by: bill.skebba
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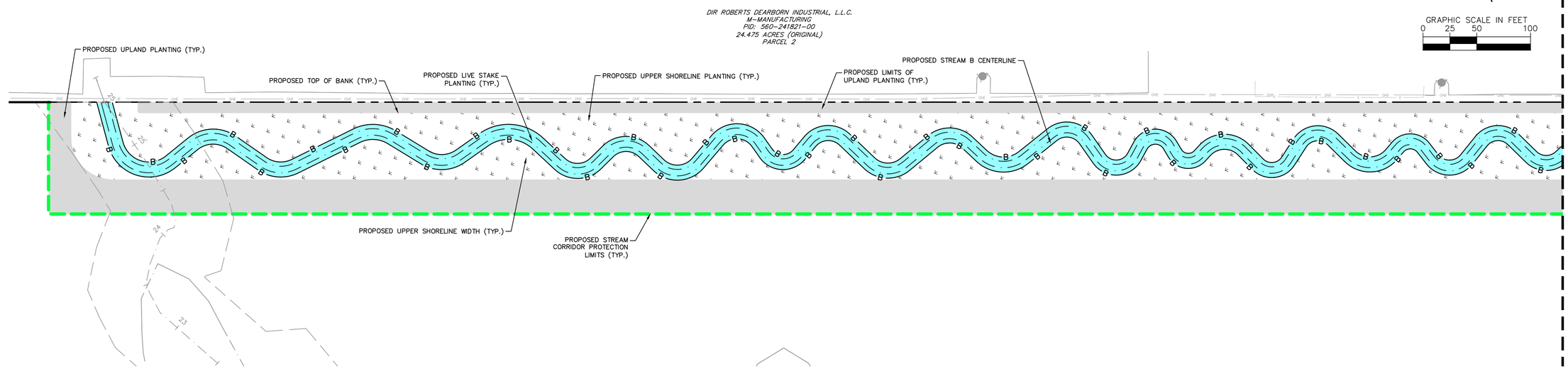

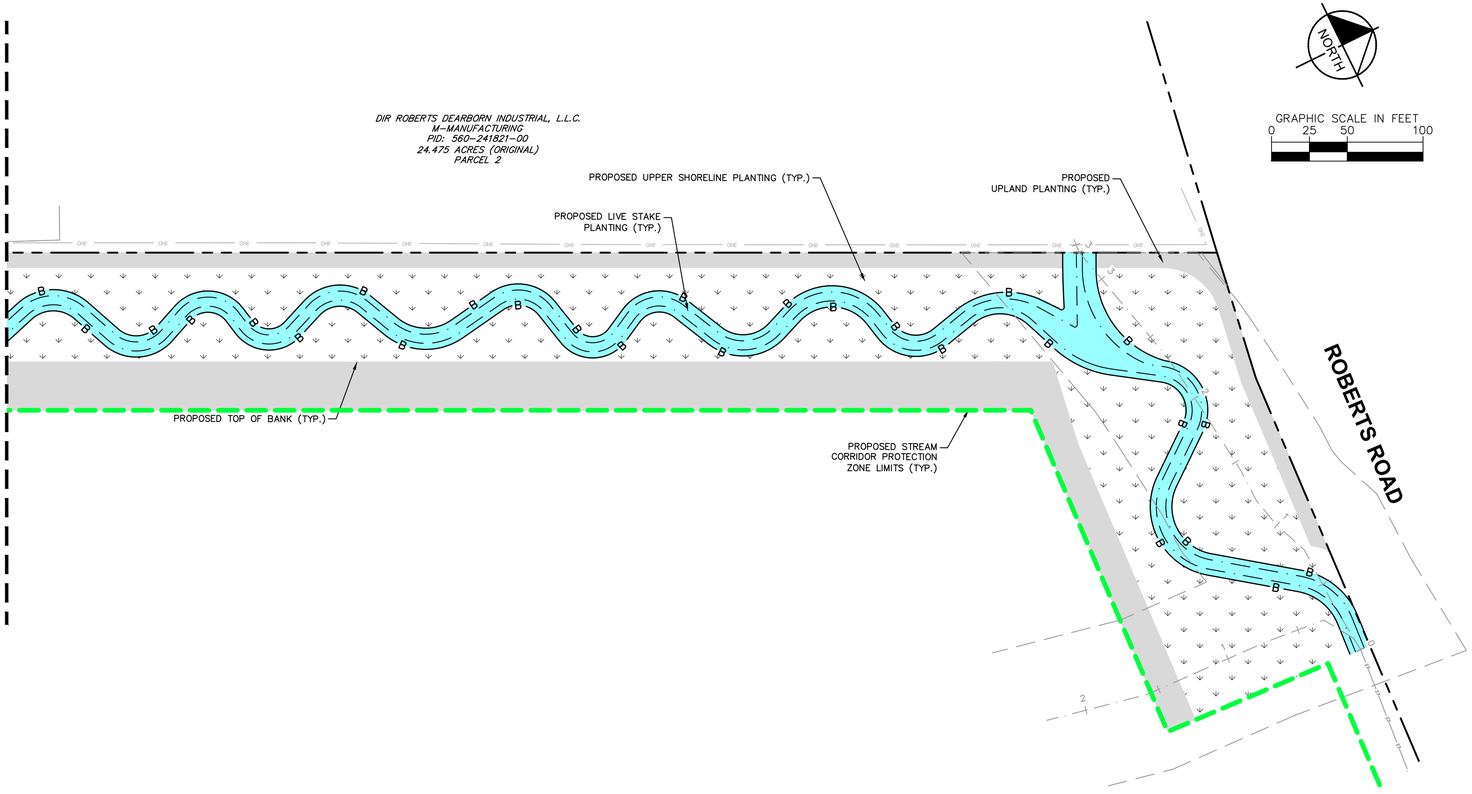

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING PAVEMENT
- EXISTING CENTERLINE
- EXISTING STORM
- EXISTING SANITARY
- EXISTING WATER LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD LINE
- EXISTING ELECTRIC
- PROPOSED RIGHT-OF-WAY
- PROPOSED STORM
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- LIVE STAKE PLANTING (3.88 AC.)
- UPPER SHORELINE PLANTING (11.56 AC.)
- UPLAND PLANTING (5.99 AC.)

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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CHECKED BY: JMM

PLANTING PLAN

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.4

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\PLANTING PLAN.dwg STREAM B Oct 17, 2022 5:50pm by: bill.skebba
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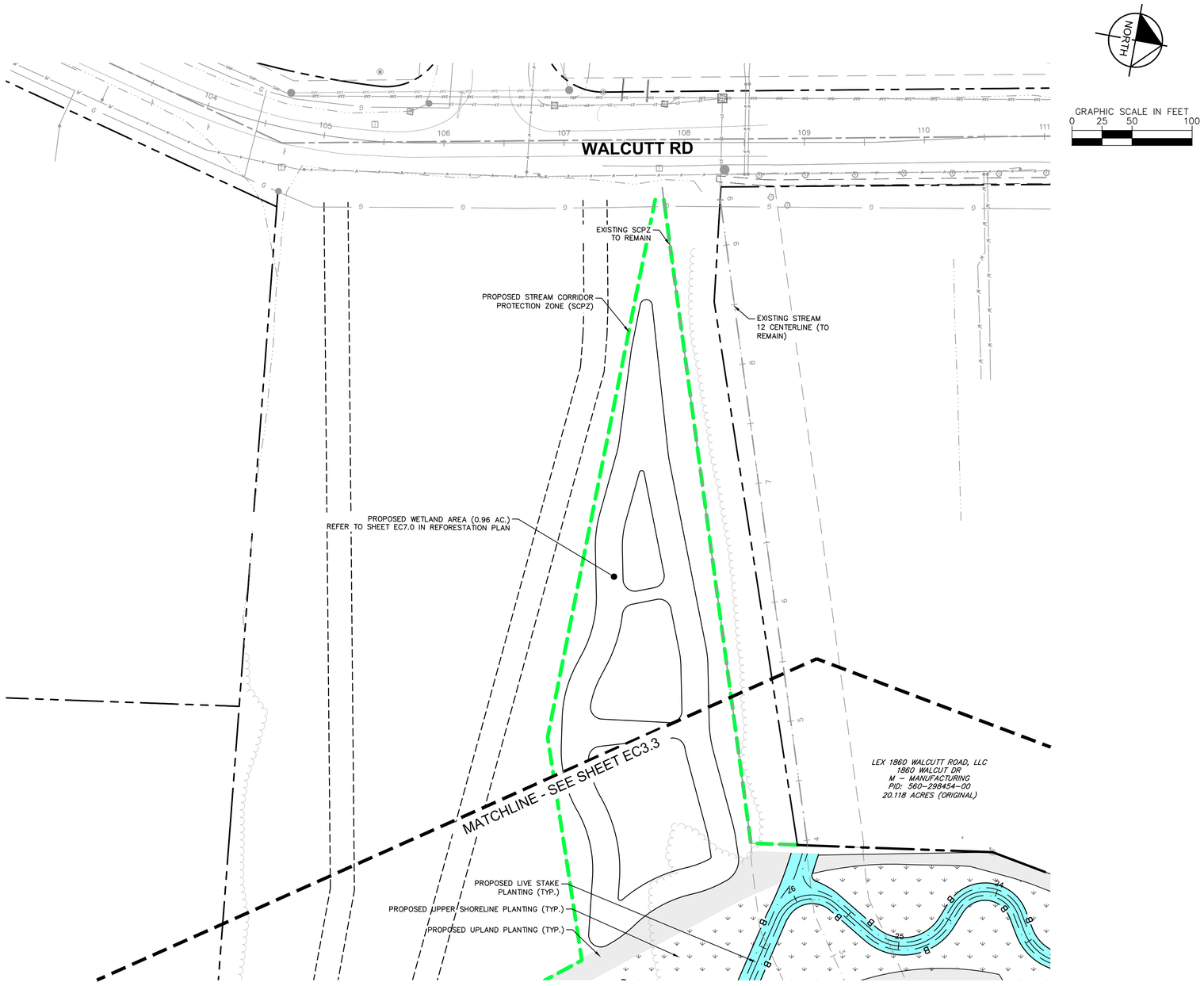

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING PAVEMENT
- EXISTING CENTERLINE
- EXISTING STORM
- EXISTING SANITARY
- EXISTING WATER LINE
- EXISTING GAS LINE
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- LIVE STAKE PLANTING (3.88 AC.)
- UPPER SHORELINE PLANTING (11.56 AC.)
- UPLAND PLANTING (5.99 AC.)

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SCALE:
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PLANTING PLAN

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC3.5

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\PLANTING PLAN.dwg EC5.6 PLANTING PLAN Oct 17, 2022 5:50pm by: bill.skebba
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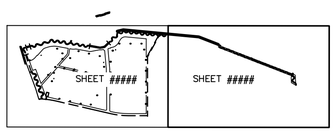
KEY MAP



LEGEND

EXISTING PROPERTY LINE	EXISTING WATER LINE
EXISTING RIGHT OF WAY	EXISTING GAS LINE
EXISTING EASEMENT	EXISTING OVERHEAD LINE
EXISTING PAVEMENT	EXISTING ELECTRIC
EXISTING CENTERLINE	PROPOSED RIGHT-OF-WAY
EXISTING STORM	PROPOSED STORM
EXISTING SANITARY	PROPOSED STREAM CORRIDOR PROTECTION LIMITS
	REFORESTATION AREA (15.22 AC.)

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

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SCALE:
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DRAWN BY: MCS
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REFORESTATION PLAN OVERVIEW

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

SHEET NUMBER
EC4.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.0 REFORESTATION PLAN OVERVIEW Oct 17, 2022 5:50pm by: bill.skebba
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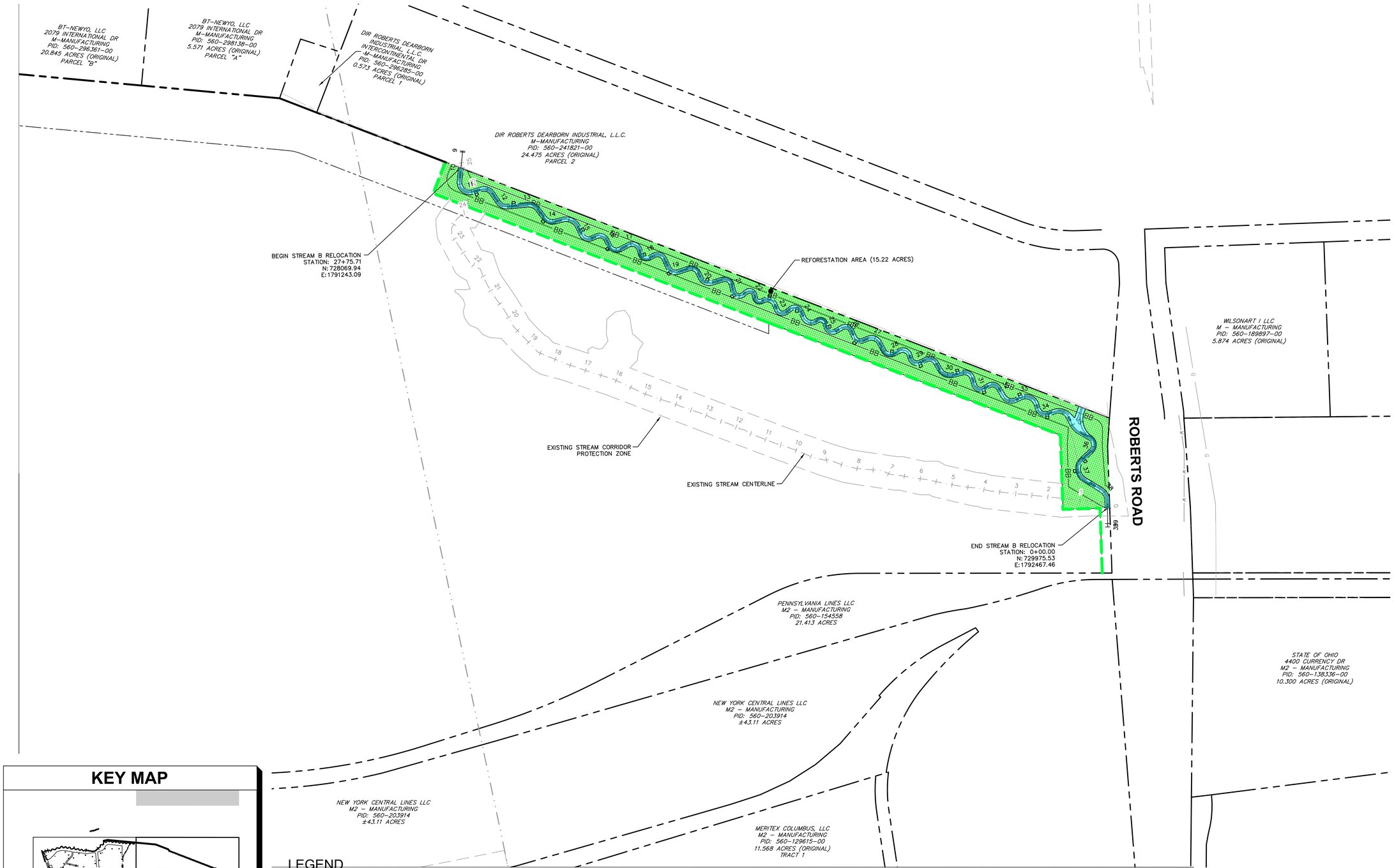
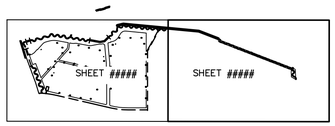


KEY MAP



LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING PAVEMENT
- EXISTING CENTERLINE
- EXISTING STORM
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- PROPOSED STORM
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- REFORESTATION AREA (15.22 AC.)

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

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SCALE:
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REFORESTATION PLAN OVERVIEW

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC4.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.1 REFORESTATION PLAN OVERVIEW Oct 17, 2022 5:50pm by: bill.skebba
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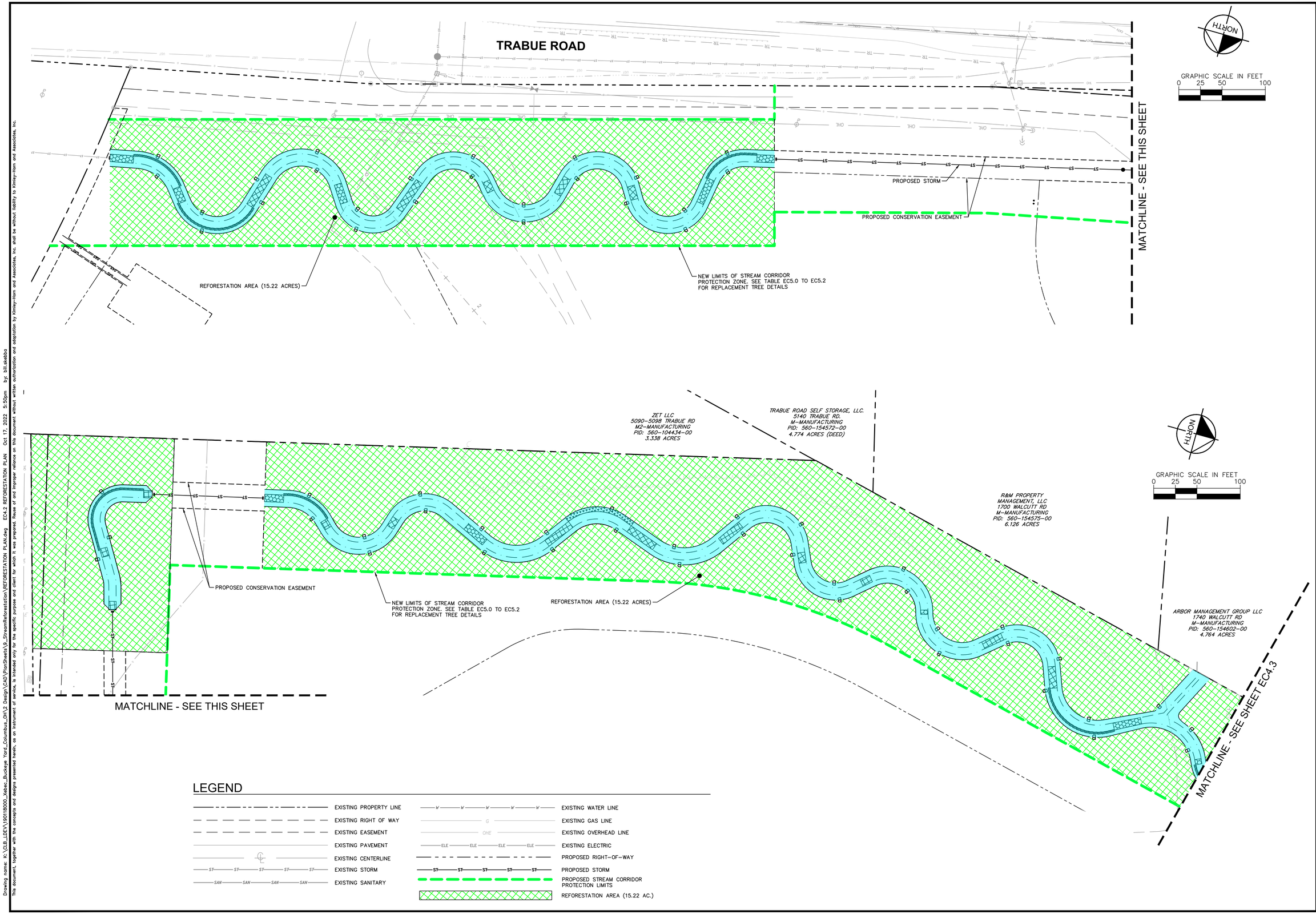

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SCALE:

DESIGNED BY: MCS
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REFORESTATION PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022

KHA PROJECT NO. 190118000

SHEET NUMBER

EC4.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.2 REFORESTATION PLAN Oct 17, 2022 5:50pm by: bill.skebba
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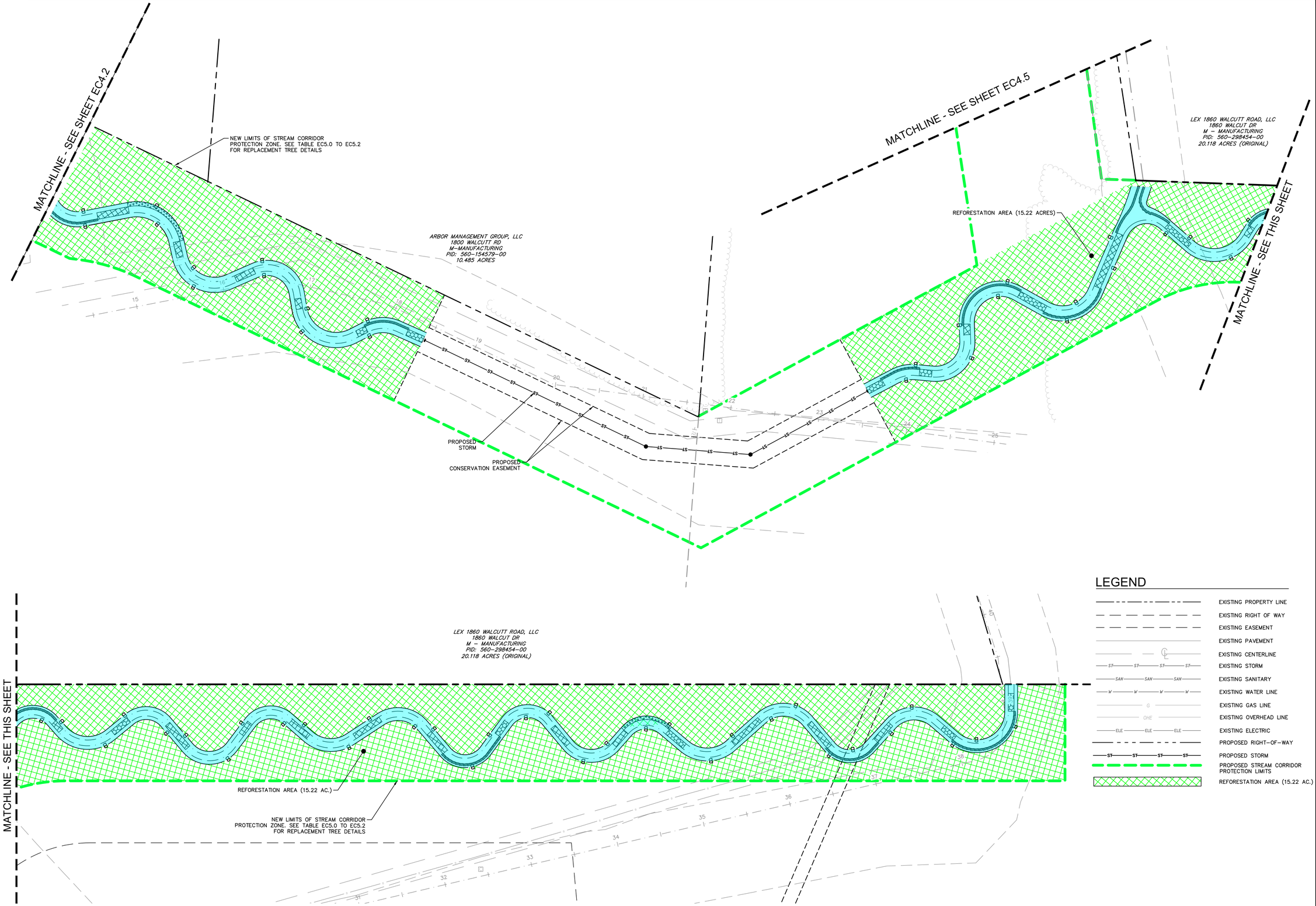

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SCALE:
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REFORESTATION PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC4.3

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.3 REFORESTATION PLAN Oct 17, 2022 5:50pm by: bill.skebba
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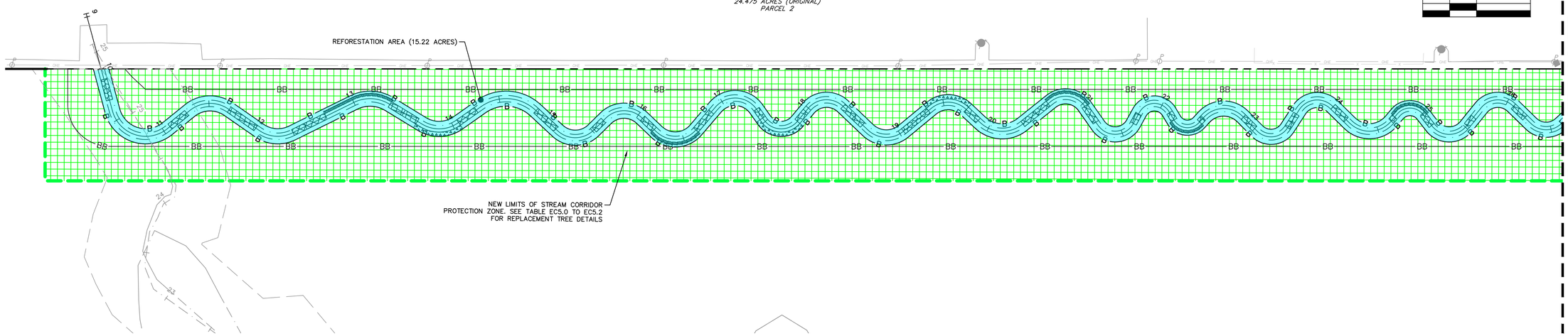

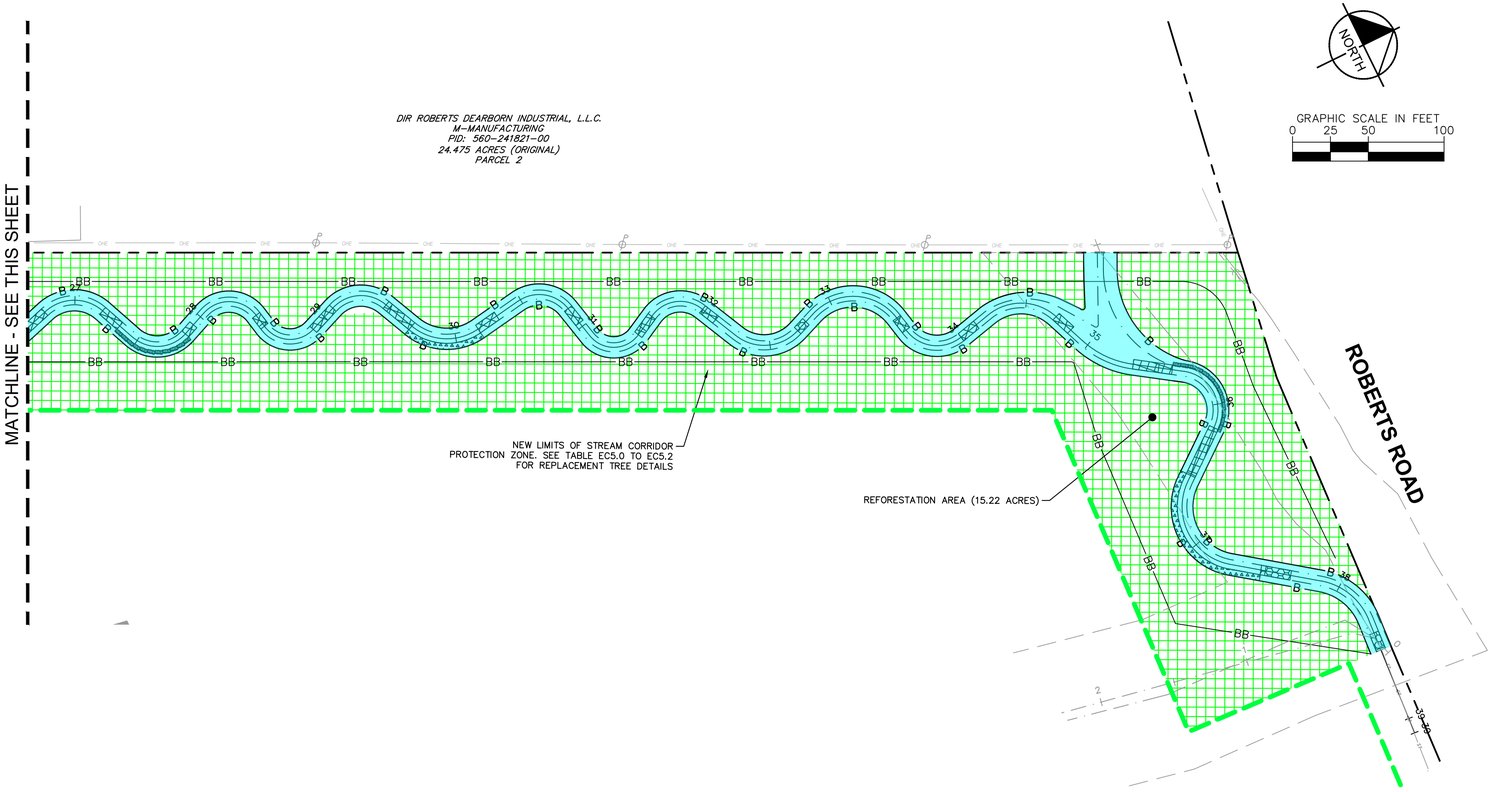

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
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- EXISTING SANITARY
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- PROPOSED STORM
- PROPOSED STREAM CORRIDOR PROTECTION LIMITS
- REFORESTATION AREA (15.22 AC.)

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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REFORESTATION PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.4 REFORESTATION PLAN Oct 17, 2022 5:50pm by: bill.skebba
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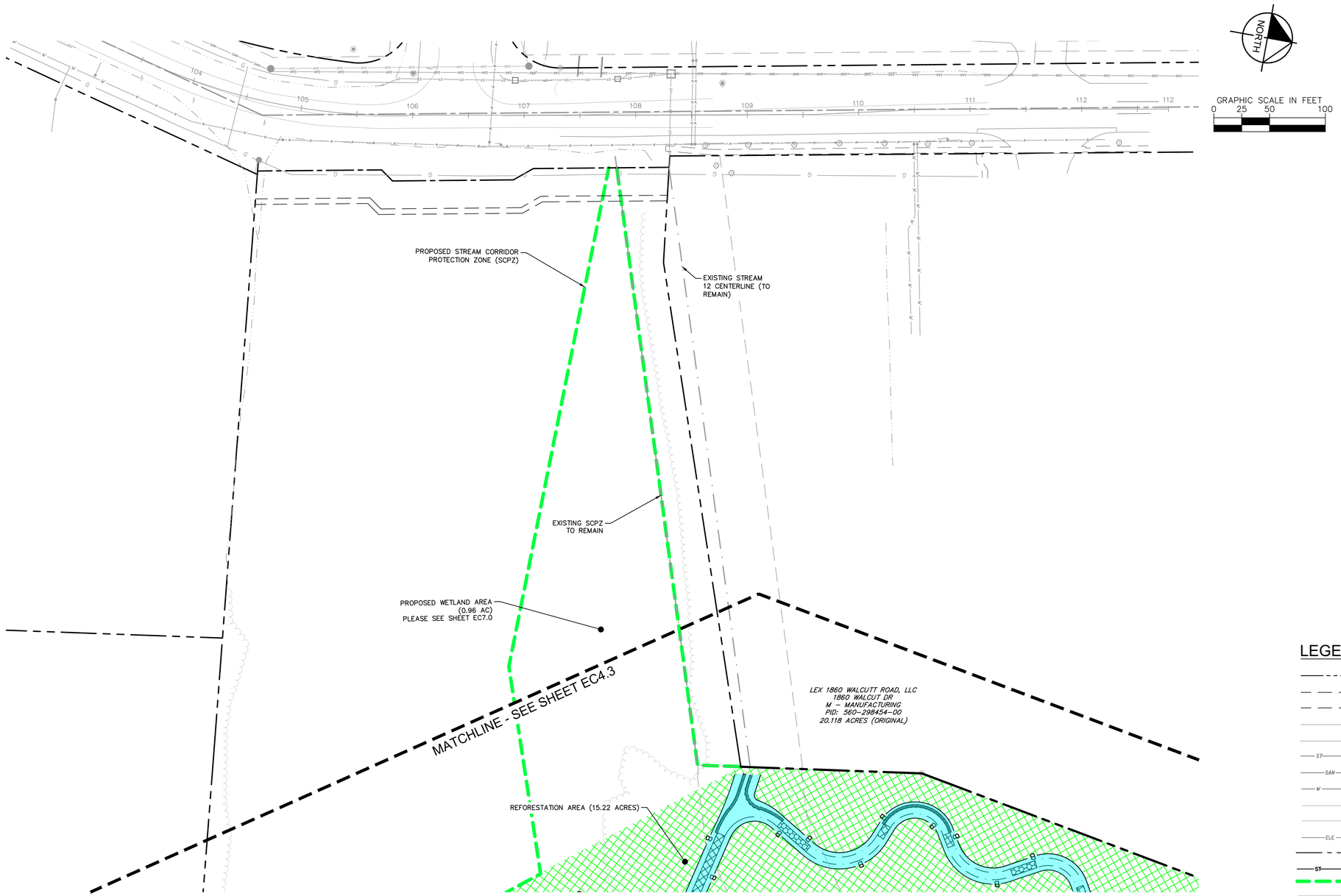

LEGEND

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- REFORESTATION AREA (15.22 AC.)

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SCALE:
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REFORESTATION PLAN

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC4.5

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION PLAN.dwg EC4.5 REFORESTATION PLAN Oct 17, 2022 5:50pm by: billi.akebba
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ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
2004	*Maclura pomifera*	OSAGE ORANGE	GOOD	7	2 TRUNK	728172.5	1791643.6	**1**
2009	*Salix ssp.*	WILLOW	GOOD	8	2 TRUNK	725559.2	1790975.9	**1**
2013	*Carya ovata*	HICKORY	GOOD	7	2 TRUNK	726471.3	1790864.8	**1**
2014	*Acer ssp.*	MAPLE	GOOD	8	2 TRUNK	725490.2	1790838	**1**
2015	*Prunus serotina*	BLACK CHERRY	GOOD	8	2 TRUNK	725508.4	1790869.5	**1**
2017	*Populus deltoides*	EASTERN COTTONWOOD	POOR	21	2 TRUNK	726653.2	1790914.1	**3**
2023	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	8		728017.4	1791387.3	**1**
2024	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8	2 TRUNK	728266.7	1791814.4	**1**
2025	*Quercus rubra*	NORTHERN RED OAK	GOOD	6		728286.7	1791802.1	**1**
2026	*Quercus rubra*	NORTHERN RED OAK	GOOD	9		728286.8	1791802.8	**1**
2027	*Quercus rubra*	NORTHERN RED OAK	GOOD	13	2 TRUNK	728267.9	1791735.8	**2**
2030	*Quercus rubra*	NORTHERN RED OAK	GOOD	18	2 TRUNK	728564.6	1791941.4	**2**
2037	*Ulmus americana*	ELM	GOOD	8	3 TRUNK	729146.6	1792218	**1**
2038	*Ulmus americana*	ELM	GOOD	7	3 TRUNK	729147.4	1792218.6	**1**
2039	*Juglans nigra*	WALNUT	POOR	14	2 TRUNK	729051.4	1792175.3	**2**
2044	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12	2 TRUNK	728679.3	1792040.8	**2**
2045	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729088	1792239.1	**2**
2046	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13	2 TRUNK	729183.7	1792272.4	**2**
2047	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14	2 TRUNK	729477.6	1792355.6	**2**
2048	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	18	2 TRUNK	729519.6	1792365.8	**2**
2051	*Populus deltoides*	EASTERN COTTONWOOD	POOR	16	2 TRUNK	729807.2	1792431.5	**2**
2052	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17	2 TRUNK	729815.5	1792432.8	**2**
2053	*Prunus serotina*	BLACK CHERRY	GOOD	6	2 TRUNK	729945.2	1792480.4	**1**
2054	*Acer ssp.*	MAPLE	GOOD	12	2 TRUNK	729946.8	1792447.3	**2**
2055	*Ulmus americana*	ELM	GOOD	9	2 TRUNK	729824.2	1792392.5	**1**
2056	*Ulmus americana*	ELM	GOOD	9	2 TRUNK	729819	1792415.4	**1**
2057	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729955.8	1792434	**2**
2059	*Acer ssp.*	MAPLE	GOOD	10	2 TRUNK	729920.6	1792185.4	**1**
2060	*Salix ssp.*	WILLOW	POOR	9	4 TRUNK	729954.8	1792298.9	**1**
2061	*Salix ssp.*	WILLOW	POOR	7	4 TRUNK	729954.7	1792299.5	**1**
2062	*Salix ssp.*	WILLOW	POOR	6	4 TRUNK	729954.6	1792300.1	**1**
2063	*Prunus serotina*	BLACK CHERRY	GOOD	12	2 TRUNK	723304	1791845.9	**2**
2065	*Juniperus virginiana*	EASTERN RED CEDAR	GOOD	4		723582	1791510.3	**1**
381037	*Acer ssp.*	MAPLE	GOOD	8		724005.9	1791146.4	**1**
381039	*Acer ssp.*	MAPLE	GOOD	6	3 TRUNK	724380.2	1790985	**1**
391001	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	20		728095.8	1791600.6	**3**
391005	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	7		728032.8	1791616	**1**
391009	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	31		728102.6	1791633.2	**5**
391010	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	31		728095.8	1791629.7	**5**
391011	*Ulmus americana*	ELM	GOOD	6		728113.6	1791629	**1**
391012	*Ulmus americana*	ELM	GOOD	6		728021	1791607.5	**1**
391016	*Ulmus americana*	ELM	POOR	6		728072.1	1791579.3	**1**
391017	*Ulmus americana*	ELM	GOOD	8		728079.2	1791569.1	**1**
391018	*Salix ssp.*	WILLOW	GOOD	12		728082.1	1791561.3	**2**
391019	*Ulmus americana*	ELM	POOR	11		728057.8	1791558	**1**
391020	*Ulmus americana*	ELM	GOOD	11		728061.1	1791547.7	**1**
391021	*Salix ssp.*	WILLOW	GOOD	13		728086.1	1791523.4	**2**
391022	*Catalpa speciosa*	CATALPA	GOOD	11		728081.9	1791514.7	**1**
391023	*Crataegus pennsylvanica*	HAWTHORN	GOOD	6		728106.6	1791521.4	**1**
391024	*Juglans nigra*	WALNUT	GOOD	13		728108.8	1791543	**2**
391026	*Ulmus americana*	ELM	GOOD	6		728122.2	1791552.2	**1**
391027	*Liriodendron tulipifera*	TULIP POPLAR	POOR	7		728126.1	1791548.7	**1**
391029	*Ulmus americana*	ELM	GOOD	6		728137.2	1791541.6	**1**
391031	*Ulmus americana*	ELM	POOR	6		728145.7	1791575.3	**1**
391032	*Liriodendron tulipifera*	TULIP POPLAR	POOR	7		728147	1791583.1	**1**
391033	*Ulmus americana*	ELM	GOOD	10		728139.7	1791593.3	**1**
391034	*Ulmus americana*	ELM	GOOD	6		728142.1	1791610.7	**1**
391035	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728132.1	1791623.3	**1**
391036	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728116.9	1791595	**2**
391040	*Maclura pomifera*	OSAGE ORANGE	GOOD	8	2 TRUNK	728171.8	1791643.6	**1**
391041	*Prunus serotina*	BLACK CHERRY	GOOD	6		728172.4	1791647.7	**1**
391042	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		728147.6	1791662.3	**2**
391043	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10	2 TRUNK	728155.1	1791663	**1**
391044	*Ulmus americana*	ELM	GOOD	6		728158.9	1791660.7	**1**
391045	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		728161.7	1791670.3	**2**
391046	*Ulmus americana*	ELM	GOOD	6		728171	1791664.6	**1**
391047	*Ulmus americana*	ELM	GOOD	8		728141.2	1791630.3	**1**
391048	*Ulmus americana*	ELM	GOOD	8		728153.1	1791639	**1**
391049	*Prunus serotina*	BLACK CHERRY	GOOD	10		728178.7	1791663.2	**1**
391065	*Maclura pomifera*	OSAGE ORANGE	GOOD	6		728084.6	1791492.3	**1**

ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
391072	*Quercus rubra*	RED OAK	GOOD	15		728080	1791415.7	**2**
391073	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	12		728076.1	1791409.1	**2**
391074	*Salix ssp.*	WILLOW	LEANING	10		728056.1	1791410.2	**1**
391075	*Salix ssp.*	WILLOW	LEANING	7		728050.8	1791411.1	**1**
391076	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	12		728074.1	1791386.9	**2**
391077	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	12		728067.3	1791383.1	**2**
391078	*Ulmus americana*	ELM	GOOD	10		728096.3	1791389	**1**
391079	*Juglans nigra*	WALNUT	GOOD	16		728097.7	1791397.1	**2**
391080	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	15		728099.2	1791378.1	**2**
391081	*Ulmus americana*	ELM	GOOD	7		728114.5	1791385.9	**1**
391082	*Carya ovata*	HICKORY	GOOD	7		728109.6	1791373.9	**1**
391088	*Acer ssp.*	MAPLE	GOOD	9		728099.6	1791441.6	**1**
391101	*Ulmus americana*	ELM	GOOD	6		728105.5	1791286.6	**1**
391102	*Maclura pomifera*	OSAGE ORANGE	GOOD	11		728089.9	1791283.9	**1**
391103	*Maclura pomifera*	OSAGE ORANGE	GOOD	12		728090	1791289.2	**2**
391104	*Ulmus americana*	ELM	GOOD	12		728085.7	1791290.4	**2**
391105	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	11		728095.4	1791310.7	**1**
391106	*Crataegus pennsylvanica*	HAWTHORN	GOOD	8		728111.4	1791318.3	**1**
391107	*Ulmus americana*	ELM	GOOD	12		728108.1	1791328.5	**2**
391109	*Ulmus americana*	ELM	GOOD	7		728105.2	1791353.9	**1**
401006	*Ulmus americana*	ELM	GOOD	6		724636.6	1790937.9	**1**
401007	*Acer ssp.*	MAPLE	GOOD	6	2 TRUNK	724672	1790941	**1**
401011	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	7		725018.2	1791014.8	**1**
401012	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	7		725058.7	1791013.1	**1**
401013	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	6		725396.6	1790982.9	**1**
401014	*Acer ssp.*	MAPLE	GOOD	7		725504.4	1790974.1	**1**
401015	*Salix ssp.*	WILLOW	GOOD	8		725562	1790960.4	**1**
401016	*Salix ssp.*	WILLOW	GOOD	8	2 TRUNK	725559.2	1790961.2	**1**
401020	*Acer ssp.*	MAPLE	GOOD	6		724675.3	1790939.6	**1**
401022	*Prunus serotina*	BLACK CHERRY	GOOD	7		724546.3	1790908	**1**
401023	*Populus deltoides*	EASTERN COTTONWOOD	POOR	16		726282	1790896.4	**2**
401024	*Populus deltoides*	EASTERN COTTONWOOD	POOR	14		726244	1790895.2	**2**
401025	*Populus deltoides*	EASTERN COTTONWOOD	POOR	16		726190.6	1790905.6	**2**
401026	*Acer ssp.*	MAPLE	GOOD	6		726027.3	1790885.2	**1**
401027	*Acer ssp.*	MAPLE	GOOD	9		725682.6	1790959.1	**1**
401028	*Acer ssp.*	MAPLE	GOOD	9		725676.2	1790963.6	**1**
401029	*Acer ssp.*	MAPLE	GOOD	10		725648.2	1790962.5	**1**
401030	*Acer ssp.*	MAPLE	GOOD	6		725626.5	1790964.4	**1**
401031	*Acer ssp.*	MAPLE	GOOD	6		725619.6	1790916.6	**1**
401051	*Acer ssp.*	MAPLE	GOOD	9		725486.1	1790778.1	**1**
401052	*Carya ovata*	HICKORY	GOOD	9		726453.1	1790884.6	**1**
401053	*Carya ovata*	HICKORY	GOOD	9		726463.6	1790880.7	**1**
401054	*Carya ovata*	HICKORY	GOOD	9		726467.7	1790863.8	**1**
401055	*Carya ovata*	HICKORY	GOOD	7	2 TRUNK	726472	1790864.8	**1**
401056	*Populus deltoides*	EASTERN COTTONWOOD	POOR	6		726483.2	1790880.7	**1**
401057	*Carya ovata*	HICKORY	GOOD	6		726479.9	1790858	**1**
411001	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		725242	1790219.9	**2**
411002	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		725248.1	1790239.3	**2**
411003	*Prunus serotina*	BLACK CHERRY	GOOD	6		725254.3	1790258.3	**1**
411004	*Populus deltoides*	EASTERN COTTONWOOD	POOR	7		725281.2	1790333.8	**1**
411005	*Prunus serotina*	BLACK CHERRY	GOOD	7		725284.1	1790350.3	**1**
411008	*Acer ssp.*	MAPLE	POOR	6		725459.4	1790778.3	**1**
411009	*Acer ssp.*	MAPLE	GOOD	7		725460.7	1790781.9	**1**
411010	*Acer ssp.*	MAPLE	GOOD	6		725477.1	1790817.7	**1**
411011	*Acer ssp.*	MAPLE	GOOD	6	2 TRUNK	725490.2	1790838.7	**1**
411012	*Prunus ssp*	BLACK CHERRY	GOOD	6	2 TRUNK	725508.4	1790870.2	**1**
411013	*Acer ssp.*	MAPLE	GOOD	10		725515.1	1790880.9	**1**
411018	*Populus deltoides*	EASTERN COTTONWOOD	POOR	7		726615.7	1790808.3	**1**
411020	*Populus deltoides*	EASTERN COTTONWOOD	POOR	11		726626.3	1790833.9	**1**
411022	*Juglans nigra*	WALNUT	GOOD	11		726637.9	1790839.8	**1**
411023	*Salix ssp.*	WILLOW	GOOD	11		726637.6	1790864.4	**1**
411025	*Acer ssp.*	MAPLE	GOOD	11		726639.7	1790868.5	**1**
411027	*Juglans nigra*	WALNUT	GOOD	10		726611.4	1790863	**1**
411035	*Maclura pomifera*	OSAGE ORANGE	GOOD	9		726667.7	1790915.4	**1**
411036	*Populus deltoides*	EASTERN COTTONWOOD	POOR	13		726653.2	1790913.5	**2**
411037	*Juglans nigra*	WALNUT	GOOD	6		726663.3	1790907.1	**1**
411039	*Juglans nigra*	WALNUT	GOOD	8		726669.6	1790849.2	**1**
411040	*Juglans nigra*	WALNUT	GOOD	6		726668.2	1790824.4	**1**

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC5.0

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg Layout1 Oct 17, 2022 5:50pm by: bill.skebba
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ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
421109	*Quercus rubra*	RED OAK	GOOD	13		728270.8	1791778.4	**2**
421111	*Quercus rubra*	RED OAK	GOOD	11		728270.6	1791787.1	**1**
421112	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17		728255.9	1791800.4	**2**
421113	*Ulmus americana*	ELM	GOOD	11		728238.2	1791789.4	**1**
451001	*Carya ovata*	SHAG BARK HICKORY	GOOD	8		728231.6	1791751.9	**1**
451002	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		728228.9	1791761.4	**2**
451003	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	22		728226.8	1791765	**3**
451004	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		728220.4	1791763.9	**3**
451005	*Populus deltoides*	EASTERN COTTONWOOD	POOR	22		728213.4	1791767	**3**
451006	*Juglans nigra*	WALNUT	GOOD	9		728212.9	1791742.1	**1**
451007	*Ulmus americana*	ELM	GOOD	6		728208.1	1791742.3	**1**
451008	*Ulmus americana*	ELM	GOOD	11		728206	1791734.1	**1**
451010	*Ulmus americana*	ELM	GOOD	7		728193.4	1791719	**1**
451011	*Crataegus pennsylvanica*	HAWTHORN	GOOD	6		728198.5	1791706.3	**1**
451012	*Ulmus americana*	ELM	GOOD	6		728192.4	1791700.2	**1**
451013	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	7		728188.5	1791687.6	**1**
451022	*Carya ovata*	SHAG BARK HICKORY	GOOD	11		728385.9	1791871.5	**1**
451023	*Carya ovata*	HICKORY	GOOD	7		728418.2	1791880	**1**
451024	*Carya ovata*	HICKORY	GOOD	7		728415.6	1791892.8	**1**
451025	*Carya ovata*	HICKORY	GOOD	11		728433.2	1791887.3	**1**
451026	*Quercus alba*	WHITE OAK	GOOD	11		728435.7	1791882.6	**1**
451027	*Carya ovata*	HICKORY	GOOD	6		728426.2	1791882.9	**1**
451028	*Ulmus americana*	ELM	GOOD	7		728454.6	1791882.5	**1**
451029	*Acer ssp.*	MAPLE	GOOD	11		728457.2	1791884	**1**
451036	*Carya ovata*	SHAG BARK HICKORY	GOOD	10		728528	1791927.8	**1**
451037	*Carya ovata*	SHAG BARK HICKORY	GOOD	6		728521	1791943.3	**1**
451038	*Carya ovata*	SHAG BARK HICKORY	GOOD	11		728541.8	1791934.8	**1**
451039	*Quercus rubra*	RED OAK	GOOD	18		728564.6	1791942.3	**2**
451040	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728552.1	1791965.4	**2**
451041	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728590.3	1791985.1	**1**
451042	*Juglans nigra*	WALNUT	GOOD	6		728597.3	1791979.1	**1**
451048	*Quercus rubra*	RED OAK	GOOD	12		728670.5	1792003.6	**2**
451049	*Carya ovata*	HICKORY	GOOD	6		728668	1792000.9	**1**
451054	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728688	1792033.8	**1**
451055	*Prunus serotina*	BLACK CHERRY	GOOD	6		728674	1792019	**1**
451056	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728682.3	1792031	**1**
451057	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728743.8	1792024.5	**2**
451061	*Carya ovata*	HICKORY	GOOD	8		728766.6	1792025.5	**1**
451063	*Juglans nigra*	WALNUT	GOOD	12		728761	1792043.3	**2**
451064	*Juglans nigra*	WALNUT	GOOD	11		728780.7	1792042.7	**1**
451066	*Ulmus americana*	ELM	GOOD	8		728779.4	1792066.6	**1**
451070	*Prunus serotina*	BLACK CHERRY	GOOD	10		728806	1792081.9	**1**
451071	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728819.7	1792091.2	**1**
451072	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728832	1792094.8	**1**
451073	*Salix ssp.*	WILLOW	FAIR	6		729225.5	1792275.2	**1**
451074	*Ulmus americana*	ELM	GOOD	6		729229.4	1792270.8	**1**
451075	*Ulmus americana*	ELM	GOOD	11		729233.3	1792257	**1**
451080	*Ulmus americana*	ELM	GOOD	8		729195.2	1792250.5	**1**
451081	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		729211.5	1792261.6	**1**
451082	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	6		729176.8	1792241	**1**
451083	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		729171.5	1792249.7	**2**
451084	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729166.2	1792250.1	**1**
451085	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729160.4	1792247.1	**2**
451087	*Ulmus americana*	ELM	GOOD	10		729146.6	1792218.6	**1**
451088	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		729130.1	1792232.3	**1**
451089	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		729125.3	1792230.8	**2**
451090	*Ulmus americana*	ELM	GOOD	9		729103	1792207.8	**1**
451091	*Acer ssp.*	MAPLE	GOOD	6		729091.2	1792221.8	**1**
451092	*Ulmus americana*	ELM	GOOD	7		729089.2	1792225.7	**1**
451093	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		729068.2	1792214.8	**2**
451094	*Salix ssp.*	WILLOW	GOOD	10		729051	1792206.6	**1**
451095	*Fagus grandifolia*	BEECH	GOOD	6		729041.6	1792198.1	**1**
451096	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	9		729034.1	1792191.6	**1**
451097	*Juglans nigra*	WALNUT	POOR	12		729050.5	1792175.3	**2**
451107	*Ulmus americana*	ELM	GOOD	11		728932.2	1792128.1	**1**
451108	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	18		728939.7	1792148.4	**2**
451109	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728946.2	1792152.6	**1**
451110	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728953.7	1792156.6	**2**
451111	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728963.2	1792156.3	**1**
451112	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	9		728979.5	1792166.1	**1**

ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
451113	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		728999.6	1792179.7	**2**
451114	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728994.3	1792178	**2**
451116	*Ulmus americana*	ELM	GOOD	13		728915.4	1792133.8	**2**
451117	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728912.5	1792136.6	**1**
451118	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728910.8	1792133.9	**1**
451119	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728892.7	1792130.9	**1**
451120	*Ulmus americana*	ELM	GOOD	10		728899.3	1792105.1	**1**
451121	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	6		728871.9	1792119.5	**1**
451122	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		728867.9	1792115.2	**2**
451123	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		728850.7	1792110.3	**1**
451124	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		728844.2	1792103.7	**1**
451125	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		728841.9	1792101.8	**2**
461000	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	9		729247.5	1792273.4	**1**
461001	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		729263.8	1792278.9	**3**
461002	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	21		729269.4	1792277.2	**3**
461009	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729325.4	1792293.9	**2**
461010	*Ulmus americana*	ELM	GOOD	9		729345.1	1792299.1	**1**
461011	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		729364.2	1792299.7	**2**
461012	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	7		729396.6	1792315.5	**1**
461013	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		729400.4	1792316.8	**1**
461014	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729421.8	1792317.2	**2**
461015	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729451.6	1792328.4	**2**
461016	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729465.9	1792330.3	**2**
461017	*Ulmus americana*	ELM	GOOD	12		729475.4	1792327	**2**
461020	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		729482.9	1792332.9	**2**
461021	*Ulmus americana*	ELM	GOOD	7		729499.2	1792327.2	**1**
461022	*Ulmus americana*	ELM	FAIR	7		729530.1	1792342	**1**
461023	*Liriodendron tulipifera*	TULIP POPLAR	GOOD	10		729535	1792332.6	**1**
461024	*Morus ssp.*	MULBERRY	GOOD	10		729540.7	1792334.4	**1**
461025	*Ulmus americana*	ELM	GOOD	8		729531.9	1792324.3	**1**
461027	*Ulmus americana*	ELM	POOR	6		729539.5	1792345.8	**1**
461028	*Ulmus americana*	ELM	POOR	6		729556.8	1792343.7	**1**
461029	*Ulmus americana*	ELM	POOR	11		729579.7	1792355.7	**1**
461031	*Ulmus americana*	ELM	POOR	7		729595.9	1792362	**1**
461032	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		729593.2	1792365.8	**2**
461034	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	6		728663.9	1792035.9	**1**
461035	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		728675.2	1792039.7	**2**
461036	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	6		728678.7	1792040.6	**1**
461037	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		728688	1792047.2	**2**
461038	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	7		728698.2	1792050.5	**1**
461039	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728698.2	1792052.4	**1**
461041	*Ulmus americana*	ELM	GOOD	6		728724.1	1792063	**1**
461042	*Ulmus americana*	ELM	GOOD	6		728727.5	1792069.9	**1**
461043	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728732.1	1792067.1	**2**
461044	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	13		728736.3	1792069.6	**2**
461045	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728782.8	1792093.4	**1**
461046	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		728790.2	1792096.3	**2**
461047	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	12		728792.3	1792094.2	**2**
461048	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		728797.7	1792098.8	**2**
461049	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728849.1	1792122.2	**1**
461050	*Ulmus americana*	ELM	POOR	9		728864.9	1792132.9	**1**
461051	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		728876.1	1792135.4	**2**
461052	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		728912.4	1792152.2	**2**
461053	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		728931.2	1792161	**1**
461054	*Ulmus americana*	ELM	GOOD	8		728936.1	1792163.7	**1**
461055	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		729000.9	1792193.7	**1**
461056	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17		729004.9	1792194.4	**2**
461057	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729020.2	1792201	**2**
461058	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		729018.4	1792203.5	**1**
461059	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		729026	1792206.8	**1**
461060	*Populus deltoides*	EASTERN COTTONWOOD	POOR	8		729048.7	1792215.8	**1**
461061	*Ulmus americana*	ELM	GOOD	8		729082.8	1792235.4	**1**
461062	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729087.5	1792239	**2**
461063	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	16		729135	1792252.2	**2**
461065	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729183.2	1792272.4	**2**
461066	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17		729213.1	1792288.6	**2**
461067	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729215.2	1792284	**2**
461068	*Ulmus americana*	ELM	GOOD	6		729257.6	1792295	**1**
461069	*Ulmus americana*	ELM	GOOD	6		729313.1	1792330	**1**
461070	*Juglans nigra*	WALNUT	GOOD	6		729312.7	1792328.3	**1**
461071	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	22		729339.5	1792315	**3**

No.	REVISIONS	DATE	BY	APR DATE	APR BY

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STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC5.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg EC6 STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE Oct 17, 2022 5:50pm by: bill.skebba
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ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
461072	*Acer ssp.*	MAPLE	GOOD	7		729343.3	1792342.9	**1**
461073	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17		729382.9	1792331.5	**2**
461074	*Acer ssp.*	MAPLE	GOOD	6		729385.3	1792347.4	**1**
461075	*Juglans nigra*	WALNUT	GOOD	6		729387.5	1792355.5	**1**
461076	*Ulmus americana*	ELM	GOOD	10		729397.2	1792359.7	**1**
461077	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729401.5	1792331.1	**1**
461078	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729402.3	1792334.3	**2**
461079	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729415.4	1792334.1	**2**
461080	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	14		729418	1792338.1	**2**
461081	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	18		729425.2	1792341.5	**2**
461082	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729428.9	1792338.3	**1**
461083	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		729431.7	1792339.6	**1**
461084	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729436.2	1792341.3	**2**
461085	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729438.9	1792344	**2**
461086	*Ulmus americana*	ELM	GOOD	10		729432.8	1792371.9	**1**
461087	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729445.3	1792343.2	**2**
461088	*Ulmus americana*	ELM	GOOD	10		729447.8	1792342.2	**1**
461089	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729466.5	1792350.5	**1**
461090	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729477.2	1792355.6	**1**
461091	*Ulmus americana*	ELM	GOOD	8		729482.8	1792386.8	**1**
461092	*Juglans nigra*	WALNUT	GOOD	8		729486.3	1792385.8	**1**
461093	*Juglans nigra*	WALNUT	GOOD	8		729500.2	1792379.5	**1**
461094	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	23		729520.3	1792365.9	**3**
461095	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	17		729528.4	1792364.9	**2**
461096	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729570.5	1792383.6	**2**
461097	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729577.8	1792382.9	**2**
461098	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		729595.7	1792386.5	**3**
461099	*Juglans nigra*	WALNUT	GOOD	11		729591.8	1792396.6	**1**
461104	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	6		729622.8	1792403	**1**
461105	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	6		729663.4	1792402.3	**1**
461106	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		729678.1	1792404.3	**1**
461107	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	16		729686.5	1792407.1	**2**
461108	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		729694.4	1792415.3	**3**
461109	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	8		729707.9	1792426.4	**1**
461110	*Carya ovata*	SHAG BARK HICKORY	GOOD	8		729742.6	1792434.1	**1**
461111	*Populus deltoides*	EASTERN COTTONWOOD	POOR	14		729806.4	1792431.4	**2**
461112	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		729814.9	1792432.7	**2**
461113	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	22		729915	1792443.9	**3**
461114	*Prunus serotina*	BLACK CHERRY	GOOD	6		729944.8	1792481.2	**1**
461115	*Gleditsia tricanthos*	HONEY LOCUST	GOOD	12		729941.7	1792463.7	**2**
461116	*Prunus serotina*	BLACK CHERRY	GOOD	6		729930.8	1792461.8	**1**
461117	*Acer ssp.*	MAPLE	GOOD	12		729947.3	1792447.3	**2**
461118	*Ulmus americana*	ELM	POOR	8		728426.2	1791898.7	**1**
461119	*Ulmus americana*	ELM	POOR	8		728451.9	1791901.5	**1**
461120	*Ulmus americana*	ELM	GOOD	9		728445.2	1791903.3	**1**
461121	*Ulmus americana*	ELM	GOOD	7		728471	1791905.7	**1**
461122	*Ulmus americana*	ELM	GOOD	6		728468.7	1791919.3	**1**
461123	*Ulmus americana*	ELM	GOOD	6		728475	1791923	**1**
461124	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	11		728485.1	1791909	**1**
461129	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		728513.5	1791908.3	**2**
471000	*Quercus rubra*	RED OAK	GOOD	8		729619	1792358.7	**1**
471001	*Crataegus pennsylvanica*	HAWTHORN	GOOD	8		729620	1792349.1	**1**
471003	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729639.9	1792361.8	**2**
471004	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729657.1	1792380.5	**1**
471005	*Crataegus pennsylvanica*	HAWTHORN	POOR	6		729650.4	1792379.7	**1**
471006	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	10		729675.4	1792384.1	**1**
471007	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729686.2	1792385	**2**
471008	*Ulmus americana*	ELM	POOR	7		729718.9	1792383.3	**1**
471009	*Ulmus americana*	ELM	POOR	7		729716.7	1792385.8	**1**
471010	*Ulmus americana*	ELM	POOR	8		729719.4	1792379.5	**1**
471013	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	23		729771.1	1792404.3	**3**
471014	*Salix ssp.*	WILLOW	GOOD	13		729795.3	1792409.9	**2**
471015	*Ulmus americana*	ELM	GOOD	9		729823.6	1792392.5	**1**
471016	*Ulmus americana*	ELM	GOOD	9		729818.9	1792416.1	**1**
471017	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729858.5	1792422.4	**2**
471019	*Ulmus americana*	ELM	GOOD	6		729888.4	1792428.6	**1**
471021	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	13		729921.2	1792425.4	**2**
471022	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	14		729955.6	1792434.6	**2**
471023	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	15		729962.4	1792405.6	**2**
471024	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		729961.9	1792392.8	**3**

ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
471025	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	18		729957.5	1792382.7	**2**
471026	*Crataegus pennsylvanica*	HAWTHORN	GOOD	7		729943.9	1792377.9	**1**
471027	*Ulmus americana*	ELM	GOOD	8		729931.6	1792368.2	**1**
471028	*Ulmus americana*	ELM	GOOD	8		729929.4	1792331.8	**1**
471029	*Acer ssp.*	MAPLE	GOOD	8		729949.1	1792323.6	**1**
471031	*Ulmus americana*	ELM	GOOD	6		729889.4	1792303.5	**1**
471032	*Ulmus americana*	ELM	GOOD	9		729916.9	1792279.3	**1**
471033	*Ulmus americana*	ELM	GOOD	9		729930	1792281.9	**1**
471034	*Ulmus americana*	ELM	GOOD	9		729934.6	1792284.1	**1**
471035	*Ulmus americana*	ELM	GOOD	6		729922	1792260.8	**1**
471036	*Ulmus americana*	ELM	GOOD	11		729914.5	1792257.5	**1**
471037	*Ulmus americana*	ELM	GOOD	9		729891.1	1792259.7	**1**
471038	*Ulmus americana*	ELM	GOOD	9		729887.2	1792247.1	**1**
471039	*Crataegus pennsylvanica*	HAWTHORN	GOOD	6		729897.2	1792243.2	**1**
471040	*Ulmus americana*	ELM	GOOD	8		729906.3	1792231	**1**
471041	*Ulmus americana*	ELM	GOOD	13		729895	1792221.3	**2**
471042	*Ulmus americana*	ELM	GOOD	12		729880.5	1792213.8	**2**
471043	*Ulmus americana*	ELM	GOOD	6		729909.5	1792218.1	**1**
471044	*Ulmus americana*	ELM	GOOD	9		729932.5	1792220.6	**1**
471045	*Crataegus pennsylvanica*	HAWTHORN	FAIR	6		729916.8	1792188.6	**1**
471046	*Acer ssp.*	MAPLE	GOOD	10		729921.8	1792185.2	**1**
471047	*Juglans nigra*	WALNUT	GOOD	6		729872.4	1792173.8	**1**
471048	*Juglans nigra*	WALNUT	GOOD	6		729861.9	1792139.1	**1**
471049	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	25		729935.9	1792172.4	**4**
471050	*Populus deltoides*	EASTERN COTTONWOOD	FAIR	25		729981.9	1792191.6	**4**
471051	*Ulmus americana*	ELM	GOOD	9		729947.7	1792200.5	**1**
471052	*Ulmus americana*	ELM	GOOD	9		729958.2	1792203.2	**1**
471053	*Ulmus americana*	ELM	POOR	9		729954.5	1792240.6	**1**
471054	*Ulmus americana*	ELM	POOR	9		729956.6	1792255.1	**1**
471055	*Ulmus americana*	ELM	FAIR	11		729952	1792256.2	**1**
471056	*Ulmus americana*	ELM	FAIR	12		729953.7	1792264.5	**2**
471057	*Prunus serotina*	BLACK CHERRY	GOOD	10		729993.7	1792265.4	**1**
471058	*Salix ssp.*	WILLOW	POOR	10		729954.7	1792298.3	**1**
471059	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	24		729965.5	1792339.5	**3**
471060	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729965.5	1792348.2	**2**
471061	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	19		729965.5	1792355.7	**3**
471062	*Prunus serotina*	BLACK CHERRY	GOOD	9		729984	1792363.8	**1**
471063	*Salix ssp.*	WILLOW	POOR	8		729969.4	1792373.3	**1**
471064	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	12		729974.4	1792408.2	**2**
471065	*Populus deltoides*	EASTERN COTTONWOOD	GOOD	18		729983.4	1792437.1	**2**
4E+06	*Liquidamber styraciflua*	SWEETGUM	POOR	9		723843.3	1791327.9	**1**
4E+06	*Prunus serotina*	BLACK CHERRY	GOOD	6		723795.3	1791371.6	**1**
4E+06	*Pyrus calleryana*	ORNAMENTAL PEAR	GOOD	6		723698.5	1791456.6	**1**
4E+06	*Prunus serotina*	BLACK CHERRY	POOR	6		723466	1791677.2	**1**
4E+06	*Prunus serotina*	BLACK CHERRY	GOOD	9		723303.5	1791845.9	**1**
4E+06	*Prunus serotina*	BLACK CHERRY	GOOD	6		723228.3	1791937	**1**
4E+06	*Juniperus virginiana*	EASTERN RED CEDAR	GOOD	6		723262.7	1791929.2	**1**
4E+06	*Acer negundo*	BOX ELDER	GOOD	6		723318.6	1791766.6	**1**
4E+06	*Juniperus virginiana*	EASTERN RED CEDAR	GOOD	6		723581.2	1791510.7	**1**
Tree 21	*Acer saccharinum*	SILVER MAPLE	GOOD	6		728531.1	1791909.7	1
Tree 62	*Quercus alba*	WHITE OAK	GOOD	16		728454.4	1791839.2	2
Tree 63	*Ulmus americana*	AMERICAN ELM	GOOD	12		728475.0	1791827.9	2
Tree 65	*Ulmus americana*	AMERICAN ELM	GOOD	14		728491.6	1791761.4	2
Tree 66	*Ulmus americana*	AMERICAN ELM	GOOD	13		72891.5	1791874.7	2
Tree 67	*Ulmus americana*	AMERICAN ELM	GOOD	7		728510.4	1791863	1
Tree 68	*Ulmus americana*	AMERICAN ELM	GOOD	9		78522.6	1791885.7	1
Tree 69	*Quercus bicolor*	SWAMP WHITE OAK	GOOD	15		728515.6	1791861.6	2
Tree 70	*Quercus alba*	WHITE OAK	GOOD	23		728544.1	1791859.2	2
Tree 72	*Juglans nigra*	BLACK WALNUT	GOOD	15		728560.9	1791854.5	2
Tree 73	*Quercus bicolor*	SWAMP WHITE OAK	GOOD	17		728565.1	1791842.9	2
Tree 74	*Quercus bicolor*	SWAMP WHITE OAK	GOOD	16		728564.5	1791835.5	2
Tree 82	*Caryan ovata*	HICKORY	GOOD	9		728547.1	1791754.2	1
Tree 83	*Caryan ovata*	HICKORY	GOOD	8		728549.2	1791771.5	1

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STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC5.2

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE Oct 17, 2022 5:50pm by: bill.skebba
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ID	LATIN NAME	COMMON NAME	CONDITION	D.B.H. (INCHES)	NOTES	NORTHING	EASTING	REPLACEMENT QUANTITY
Tree 87	*Ulmus americana*	AMERICAN ELM	GOOD	7		728536.5	1791778.8	1
Tree 88	*Ulmus americana*	AMERICAN ELM	GOOD	8		728518.1	1791784.4	1
Tree 89	*Ulmus americana*	AMERICAN ELM	GOOD	9		728508	1791795.2	1
Tree 90	*Caryan ovata*	HICKORY	GOOD	7		728500.2	1791816.6	1
Tree 91	*Ulmus americana*	AMERICAN ELM	GOOD	11		728526.8	1791829.8	1
Tree 92	*Ulmus americana*	AMERICAN ELM	GOOD	7		728538.4	1791823.1	1
Tree 93	*Ulmus americana*	AMERICAN ELM	GOOD	11		728528.6	1791865.2	1
							TOTAL	**691**

*Locations are approximate and based on sub-meter accuracy GPS provided by CESO Survey, dated 02/18/2022.

*The diameter at breast height value shown in the table above for multi-trunk tree(s) is the average diameter of the multipe tree stems.

*All plant materials shall be in accordance with the most recent ANSI Z60.1 publication.

*All replacement trees shall be between 1" CAL MIN.

*Additional bare root plantings are required at a rate of 400 native wood plants per acre and a min. of 136 trees per acre. All tree plantings shall be warrantied at a 100% survival rate for a period of 1 year. Bare root plantings and containerized shrubs shall be warranted at a rate of 80%. Planting after 5/7 requires watering throughout the remainder of the spring and summer.

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STREAM CORRIDOR PROTECTION ZONE REFORESTATION SUMMARY TABLE

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022

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PLEASE NOTE INFORMATION IN PROGRESS

TREE REPLACEMENT PLANT LIST

Common Name	Genus	Species	Family	Location	Total	% of total	per acre
Red Maple	*Acer*	*rubrum*	*Sapindaceae*	Floodplain/Shoreline	85	3%	
Sugar Maple	*Acer*	*saccharinum*	*Sapindaceae*	Floodplain/Shoreline	85	3%	
Black Maple	*Acer*	*nigrum*	*Sapindaceae*	Floodplain/Shoreline	85	3%	
Silver Maple	*Acer*	*saccharum*	*Sapindaceae*	Floodplain/Shoreline	85	3%	
Norway Maple	*Acer*	*platanoides*	*Sapindaceae*	Upland	85	3%	
Boxelder	*Acer*	*negundo*	*Sapindaceae*	Floodplain/Shoreline	85	3%	
Shagbark Hickory	*Carya*	*ovata*	*Juglandaceae*	Upland	100	4%	
American Chestnut	*Castanea*	*dentata*	*Fagaceae*	Upland	85	3%	
American Sycamore	*Platanus*	*occidentalis*	*Platanacea*	Floodplain/Shoreline	100	4%	
Eastern Cottonwood	*Populus*	*deltoides*	*Salicaceae*	Floodplain/Shoreline	100	4%	
Black Willow	*Salix*	*nigra*	*Salicaceae*	Floodplain/Shoreline	85	3%	
Peachleaf Willow	*Salix*	*amydaloides*	*Salicaceae*	Floodplain/Shoreline	85	3%	
Yellow Buckeye	*Aesculus*	*flava*	*Hippocastanaceae*	Upland	85	3%	
Ohio Buckeye	*Aesculus*	*glabra*	*Hippocastanaceae*	Floodplain/Shoreline	85	3%	
Honey Locust	*Gleditsia*	*tricanthos*	*Caesalpanaceae*	Floodplain/Shoreline	85	3%	
American Basswood	*Tilia*	*americana*	*Tiliaceae*	Floodplain/Shoreline	85	3%	
Kentucky Coffee Tree	*Gymnocladus*	*dioicus*	*Fabaceae*	Upland	85	3%	
Austrian Pine	*Pinus*	*nigra*	*Pinaceae*	Upland	90	3%	
Scotch Pine	*Pinus*	*sylvestris*	*Pinaceae*	Upland	100	4%	
Pin Oak	*Quercus*	*palustris*	*Fagaceae*	Floodplain/Shoreline	85	3%	
Blackjack Oak	*Quercus*	*marilandica*	*Fagaceae*	Upland	50	2%	
Post Oak	*Quercus*	*stellata*	*Fagaceae*	Upland	100	4%	
Scarlett Oak	*Quercus*	*coccinea*	*Fagaceae*	Upland	80	3%	
Chinquapin Oak	*Quercus*	*muehlenbergii*	*Fagaceae*	Upland	80	3%	
Swamp White Oak	*Quercus*	*bicolor*	*Fagaceae*	Floodplain/Shoreline	100	4%	
Red Mulberry	*Morus*	*rubra*	*Moraceae*	Floodplain/Shoreline	85	3%	
American Elm	*Ulmus*	*americana 'Princeton'*	*Ulmaceae*	Floodplain/Shoreline	85	3%	
American Elm	*Ulmus*	*americana 'Jefferson'*	*Ulmaceae*	Floodplain/Shoreline	85	3%	
American Elm	*Ulmus*	*americana 'Valley Forge'*	*Ulmaceae*	Floodplain/Shoreline	85	3%	
American Elm	*Ulmus*	*americana 'Lewis & Clark'*	*Ulmaceae*	Floodplain/Shoreline	85	3%	
Hackberry	*Celtis*	*occidentalis*	*Ulmaceae*	Floodplain/Shoreline	85	3%	
Papaw	*Asimina*	*triloba*	*Annonaceae*	Floodplain/Shoreline	80	3%	
NOTE: PLANTINGS WITHIN THE SCPZ MITIGATION AREA SHALL BE INSTALLED IN AN IRREGULAR MANNER THAT WILL APPEAR NATURAL (AVOID GRID OR ROW BASED PLANTINGS). ALL TREES SHALL BE PROTECTED WITH TREE GUARDS TO PREVENT DAMAGE BY MALE DEER, VOLES, AND OTHER WILDLIFE. TREE GUARDS SHOULD BE A MINIMUM OF OF 4-INCHES IN DIAMETER, 3' IN HEIGHT (OR TO LOWEST BRANCH) AND INSTALLED WTH SECURE CONTACT TO THE GROUND.							
Category (min needed/%)							
Total Trees (2,765)					**2765**		
Total Shoreline Trees (65%)					1825	66%	
Total Upland Trees (35%)					940	34%	

Genus	Percent Total
Acer	18%
Carya	4%
Castanea	3%
Platanus	4%
Salix	6%
Aesculus	6%
Gleditsia	3%
Tilia	3%
Gymnocladus	3%
Pinus	7%
Quercus	18%
Morus	3%
Ulmus	12%
Celtis	3%
Asimina	3%
Populus	4%
TOTAL	100%

Family	Percent Total
Sapindaceae	18%
Juglandaceae	4%
Fagaceae	24%
Platanacea	4%
Salicaceae	10%
Hippocastanaceae	6%
Caesalpanaceae	3%
Tiliaceae	3%
Pinaceae	7%
Moraceae	3%
Ulmaceae	15%
Annonaceae	3%
TOTAL	100%

SHRUB/LIVE STAKING PLANT LIST

Common Name	Genus	Species	Family	Location	Total	% of total	per acre
Smooth Alder	*Alnus*	*serrulata*	*Betulaceae*	*OBL - Wetland*			
Bog-Rosemary	*Andromeda*	*glaucophylla*	*Ericaeae*	*OBL - Wetland*			
Red Chokeberry	*Aronia*	*arbutifolia*	*Rosaceae*	*FACW - Facilitative Wetland*	*200*		
Red-Osier Dogwood	*Cornus*	*sericea*	*Cornaceae*	*(FACW+) - Facilitative Wetland*	*302*		
Silky Dogwood	*Cornus*	*amomum*	*Cornaceae*	*FACW - Facilitative Wetland*	*250*		
Autumn Willow	*Salix*	*serissima*	*Salicaceae*	*OBL - Wetland*	*300*		
Silky Willow	*Salix*	*sericea*	*Salicaceae*	*OBL - Wetland*	*250*		
Common Elderberry	*Sambucus*	*canadensis*	*Caprifoliaceae*	*(FACW-) - Facilitative Wetland*	*250*		
Total Whole area (8,132)					*1552*		
Total live stake area (1,552)					***1552***		

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REFORESTATION - PLANTING LISTS

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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SEED MIXES

UPPER SHORELINE SEED MIX

MIX 167 - NOTHERN RIPARIAN BUFFER MIX		
Common Name	**Botanical Name**	**PLS Oz.**
Fowl Bluegrass	Poa palustris	0.3
Tickle Grass	Agrostis scabra	0.1
Canada Wild Rye	Elymus canadensis	1.2
Barnyard Grass	Echinochloa muricata	0.7
Big Bluestem	Andropogon gerardii	2.75
Deer Tongue Grass	Panicum clandestinum	1.1
Fall Panicum	Panicum anceps	1.1
Switchgrass	Panicum virgatum	2.75
Ohio Spiderwort	Tradescantia ohiensis	0.4
American Senna	Senna hebecarpa	1
White Snakeroot	Eupatorium rugosum	0.1
Lance-Leaved Goldenrod	Euthamia graminifolia	0.4
False Sunflower	Heliopsis helianthoides	0.6
Cup Plant	Silphium perfoliatum	1
Swamp Milkweed	Asclepias incarnata	0.4
Showy Tickseed	Bidens aristosa	0.5
Sneezeweed	Helenium autumnale	0.3
Yellow Wingstem	Verbesina alternifolia	0.6
New York Ironweed	Vernonia noveboracensis	0.4
New England Aster	Aster novae-angliae	0.3

MIX AVAILABLE FROM ROUNDSTONE SEED, MIX 167

SEED AT RATE OF 10 PLS POUNDS/ACRE
SEED WITH COVER CROP OF OATS, JAPANESE MILLET, WINTER PEA, OR ANNUAL RYE
DEPENDENT ON SEASON, AT A RATE OF 12 POUNDS/ACRE

SPECIFIED MIX DEPENDENT ON AVAILABILITY DURING TIME OF CONSTRUCTION AND CHANGES TO SUPPLIER'S MIX COMPOSITION.

UPLAND PLANTING SEED MIX

MIX NS-D1 - NORTHERN POLLINATOR CONSERVATION MIX		
Common Name	**Botanical Name**	**PLS Oz.**
Yarrow	Achillea millefolium	0.147
Lance Leaved Coreopsis	Coreopsis lanceolata	0.887
Appalachian Beardtongue	Penstemon lavigatus	0.094
Bergamot	Monarda fistulosa	0.218
Common Milkweed	Asclepias syriaca	0.712
Butterfly Milkweed	Asclepias tuberosa	0.655
Blackeyed Susan	Rudbeckia hirta	0.641
Goats Rue	Tephrosia virginiana	0.503
Prairie Blazing Star	Liatris pycnostachya	0.282
Greyheaded Coneflower	Ratibida pinnata	0.68
Purple Coneflower	Echinacea purpurea	1.95
Wild Senna	Cassia marilandica	1.406
False Sunflower	Heliopsis helianthoides	1.199
White Wingstem	Verbesina virginica	0.525
Joe-Pye Weed	Eupatorium fistulosum	0.137
Roundhead Lespedeza	Lespedeza capitata	0.384
Partridge Pea	Cassia fasciculata	0.911
Tall Coreopsis	Coreopsis tripteris	0.235
Evening Primrose	Oenothera biennis	0.198
Hairy Mountain Mint	Pycnanthemum pilosum	0.047
New England Aster	Aster novae-angliae	0.227
Iron Weed	Vernonia altissima	0.427
Tall Goldenrod	Solidago altissima	0.535
Little Bluestem	Schizachyrium scoparium	0.771
Indian Grass	Sorghastrum nutans	1.102
Switchgrass	Panicum virgatum	0.742
Tall Dropseed	Sporobolus compositus	0.385

MIX AVAILABLE FROM ROUNDSTONE SEED, MIX NS-D1

SEED AT RATE OF 8 PLS POUNDS/ACRE
SEED WITH COVER CROP OF OATS, JAPANESE MILLET, WINTER PEA, OR ANNUAL RYE
DEPENDENT ON SEASON, AT A RATE OF 15 POUNDS/ACRE

SPECIFIED MIX DEPENDENT ON AVAILABILITY DURING TIME OF CONSTRUCTION AND CHANGES TO SUPPLIER'S MIX COMPOSITION.

PERMANENT SEED MIX
(INSTALL OUTSIDE SCPZ UPTO LIMITS OF DISTURBANCE)

MIX 180 - NOTHERN WOODLAND EDGE / PART SHADE MIX		
Common Name	**Botanical Name**	**PLS Oz.**
Bottlebrush Grass	Elymus hystrix	0.5
Virginia Wild Rye	Elymus virginicus	2.3
Canada Wild Rye	Elymus canadensis	1
Creeping Red Fescue	Festuca rubra	1.5
Fall Panicum	Panicum anceps	1.6
Upland Bentgrass	Agrostis perennans	0.1
Broomsedge	Andropogon virginicus	0.5
Purple Top	Tridens flavus	1
Deer Tongue Grass	Panicum clandestinum	1
Fox Sedge	Carex vulpinoidea	0.5
Lance Leaved Coreopsis	Coreopsis lanceolata	1
White Wild indigo	Baptisia alba	0.2
Ohio Spiderwort	Tradescantia ohiensis	0.5
Large Coreopsis	Coreopsis major	0.5
Columbine	Aquilegia canadensis	0.5
Bergamot	Monarda fistulosa	0.2
Lupine	Lupinus perennis	1
Slender Mountain Mint	Pycnanthemum tenuifolium	0.15
Purple Coneflower	Echinacea purpurea	0.5
Showy Tickseed	Bidens aristosa	0.75
Evening Primrose	Oenothera biennis	0.2
Smooth Aster	Aster laevis	0.3
Gray Goldenrod	Solidago nemoralis	0.2

MIX AVAILABLE FROM ROUNDSTONE SEED, MIX 180

SEED AT RATE OF 10 PLS POUNDS/ACRE
SEED WITH COVER CROP OF OATS, JAPANESE MILLET, WINTER PEA, OR ANNUAL RYE
DEPENDENT ON SEASON, AT A RATE OF 12 POUNDS/ACRE

SPECIFIED MIX DEPENDENT ON AVAILABILITY DURING TIME OF CONSTRUCTION AND CHANGES TO SUPPLIER'S MIX COMPOSITION.

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REFORESTATION-
SEED MIXES

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg EC5.5 REFORESTATION- SEED MIXES Oct 17, 2022 5:50pm by: bill.skebba
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ANSI NURSEY STOCK STANDARDS

PLEASE NOTE INFORMATION IN PROGRESS

Table 3 – Specifications for Type 1 shade trees

Specifications for field grown Type 1 shade trees shall include plant size, by caliper. Specifications for container grown Type 1 shade trees shall include plant size, by height, through 7-8′ size designation, and container class or box size equivalent. Thereafter, plant size specification shall be by caliper.

Height measurements shall be in one-foot intervals. Caliper measurements shall be ⅛-inch intervals from ½″ through ¾″, ¼-inch intervals through 1¾-2″, then ½-inch intervals through 5½-6″, then one-inch intervals through 9-10″, then two-inch intervals from 10-12″ and up. Decimal equivalents to fractions may be used.

Examples: A*cacia stenophylla, Acer rubrum, A. saccharinum, Betula, Cinnamomum camphora, Eucalyptus microtheca, Fraxinus, Ginkgo, Gleditsia, Liriodendron, Platanus, Populus, Quercus macrocarpa, Q. palustris, Q. phellos, Q. virginiana (southeastern climates), Salix. Tilia Americana, Zelkova serrata*

Caliper / height specification	Average height range	Typical maximum height	Minimum root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
½ in. / 4 ft.	4 to 5 ft.	6 ft.	12 in.	7 ⅞ in	#2,#3,#5	5 in.
⅝ in. / 5 ft.	5 to 6 ft.	8 ft.	13 in.	8 ⅜ in	#3, #5,#7	8 in.
¾ in. / 6 ft.	6 to 8 ft.	10 ft.	14 in.	9 in.	#5,#7,#10	8 in.
1 in. / 7 ft.	8 to 10 ft.	11 ft.	16 in.	10 ⅜ in.	#7,#10,#15	10 in.
1 ¼ in.	8 to 10 ft.	12 ft.	18 in.	11 ¾ in.	#10,#15,#20	10 in.
1 ½ in.	10 to 12 ft.	14 ft.	20 in.	12 in.	#15,#20,#25	12 in.
1 ¾ in.	10 to 12 ft.	14 ft.	22 in.	13 ⅛ in.	#15,#20,#25,#45	14 in.

Table 4 – Specifications for Type 2 shade trees

Specifications for field grown Type 2 shade trees shall include plant size, by caliper. Specifications for container grown Type 2 shade trees shall include plant size, by height, through 7-8′ size designation, and container class. Thereafter, plant size specification shall be by caliper.

Height measurements shall be in one-foot intervals. Caliper measurements shall be ¼-inch intervals through 1¾-2″, then ½-inch intervals through 5½-6″, then one-inch intervals through 9-10″, then two-inch intervals from 10-12″ and up. Decimal equivalents to fractions may be used.

Examples: *Aesculus pavia, Brachychiton acerifolius, Celtis reticulata, Cladrastis lutea (kentukea), Cocculus laurifolius, Conocarpus erectus* var. *sericeus, Fagus sylvatica, Koelreuteria paniculata, Liquidamber styraciflua, Magnolia grandiflora, Nyssa sylvatica, Quercus alba, Q. fusiformis, Sorbus sucuparia, Syringa reticulata, Tabebuia cariaba, Tilia cordata, T. euchlora*

Caliper / height specification	Minimum height (⅔ Type 1 height)	Typical maximum height	Minimum root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
¼ in. / 2 ft.					#1,#2,#3	5 in.
½ in. / 4 ft.	3 ft.	6 ft.	12 in.	7 ⅞ in.	#2,#3,#5	5 in.
¾ in. / 6 ft.	4 ft.	7 ft.	14 in.	9 in.	#5,#7,#10	8 in.
1 in. / 7ft.	5 ft.	8 ft.	16 in.	10 ⅜ in.	#7,#10,#15	10 in.
1 ¼ in.	6 ft.	9 ft.	18 in.	11 ¾ in.	#10,#15,#20	10 in.
1 ½ in.	7 ft.	10 ft.	20 in.	12 in.	#15,#20,#25	12 in.
1 ¾ in.	8 ft.	11 ft.	22 in.	13 ⅛ in.	#15,#20, #25,#45	14 in.
2 in.	8 ft.	12 ft.	24 in.	14 ⅛ in.	#20,#25,#45	16 in.
2 ½ in.	8 ft.	14 ft.	28 in.	17 in.	#25,#45,#65	18 in.
3 in.	9 ft.	15 ft.	32 in.	19 in.	#45,#65,#95/100	20 in.
3 ½ in.	9 ft.	16 ft.	38 in.	23 in.	#65,#95/100	22 in.
4 in.	11ft.	18 ft.	42 in.	25 in.	#95/100	24 in.
4 ½ in.	12 ft.	20ft.	48 in.	29 in.		30 in.
5 in.	13 ft.	22 ft.	54 in.	32 in.		
5 ½ in.			57 in.	34 in.		
6 in.			60 in.	36 in.		
7 in.			70 in.	42 in.		
8 in.			80 in.	48 in.		

Table 9 – Deciduous shrubs – Type 0 tender shrubs

Plant size specification indicates height or spread, whichever is greater, after one full season of growth after shipment, using three-inch intervals through 15-18″, then six-inch intervals through 30-36″, then one foot intervals from 3-4′ and up.

Examples: *Buddleia, Caesalpina pulcherrima, Caryopteris, Hydrangea macrophylla, H. arborescens, Vitex*

Height or spread	Minimum number of canes	Minimum spread of roots or root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
6 in.	2	3 in.	1 ⅞ in.	#SP4,#1,#2	5 in.
9 in.	2	4 in.	2 ⅝ in.	#1,#2,#3	5 in.
12 in.	3	5 in.	3 ¼ in.	#1,#2,#3,#5	5 in.
15 in.	3	7 in.	4 ½ in.	#2,#3,#5	5 in.
18 in.	4	9 in.	5 ¾ in.	#3,#5,#7	8 in.
24 in.	4	11 in.	7 ⅛ in.	#5,#7,#10	8 in.

Table 10 – Deciduous shrubs – Type 1 small or dwarf shrubs

Plant size specification indicates height or spread, whichever is greater, using three-inch intervals through 15-18″, then six-inch intervals through 30-36″

Examples: *Berberis thunbergii 'Crimson Pygmy,' Cotoneaster apiculata, C. dameri 'Coral Beauty,' C. horizontalis, Cytisus prostrata, Deutzia gracilis 'nikko,' Forsythia 'Arnold Dwarf,' F. x bronxensis, F. x Gold Tide, Fothergilla 'Blue Mist,' Genista pilosa, Itea virginica Little Henry, Salix prostrata, Spiraea japonica 'alpina,' S. 'Gold Mound,' S. 'Little Princess,' Symphoricarpos x chenaulti, Viburnum opulus nanum, Weigela floribunda 'Minuet'*

Height or Spread	Minimum number of canes	Minimum spread of roots or root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
6 in.	3	4 in.	2 ⅝ in.	#SP4,#1	5 in.
9 in.	3	6 in.	3 ⅞ in.	#1,#2	5 in.
12 in.	4	8 in.	5 ¼ in.	#1,#2,#3	5 in.
15 in.	4	9 in.	5 ¾ in.	#2,#3,#5	5 in.
18 in.	5	10 in.	6 ½ in.	#3,#5	8 in.
24 in.	5	11 in.	7 ⅛ in.	#5,#7	8 in.
30 in.	6	12 in.	7 ¾ in.	#5,#7,#10	10 in.

Table 11 – Deciduous shrubs – Type 2 intermediate

Plant size specification indicates height, using three-inch intervals through 3-6″, then six-inch intervals through 18-24″, then one-foot intervals from 2-3′ to 6′7′

Examples: *Azalea x (exbury, mollis hybrids), Chaenomeles japonica, Cornus sericea, Cotoneaster devaricata, Euonymus alata 'Compacta,' Fothergilla 'Mount Airy,' Lagerstroemia indica 'Victor,' Potentilla fruticosa, Spiraea x bumalda 'Froebelii,' S. nipponica 'Snowmound,' S. x vanhouttei, Viburnum carlesii, V. juddi, Weigela floribunda Wine & Roses, 'Vanicek,' W. florida 'Java Red'*

Height	Minimum number of canes	Minimum spread of roots or root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
6 in.	3	6 in.	3 ⅞ in.	#SP4,#1	5 in.
12 in.	3	8 in.	5 ¼ in.	#1,#2	5 in.
18 in.	4	10 in.	6 ½ in.	#2,#3,#5	8 in.
2 ft.	4	12 in.	7 ¾ in.	#3,#5,#7	8 in.
3 ft.	5	14 in.	9 in.	#5,#7,#10	10 in.
4 ft.	5	18 in.	11 in.	#7,#10,#15	12 in.
5 ft.	6	24 in.	14 in.	#10,#15,#25	14 in.
6 ft.	6	30 in.	18 in.	#15,#25	16 in.

Table 12 – Type 3 large or tall deciduous shrubs

Plant size specification indicates height, using three-inch intervals through 3-6″, then six-inch intervals through 18-24″, then one-foot intervals through 5-6′, then two-feet intervals from 6-8′ and up.

Examples: *Amelanchier laevis, Cornus racemosa, Forsythia (tall varieties), Hamamelis virginiana, Ilex verticillata, Ligustrum (tall varieties), Physocarpus, Syringa 'Madame Lemoine,' Viburnum opulus, V. lantana, V. plicatum, Weigela floribunda 'Eva Radke'*

Height	Minimum number of canes	Minimum spread of roots or root ball diameter	Minimum root ball depth	Acceptable container classes	Minimum acceptable in-ground fabric bag size (diameter)
12 in.	3	8 in.	5 ¼ in.	#1	5 in.
18 in.	4	10 in.	6 ½ in.	#2,#3	8 in.
2 ft.	5	12 in.	7 ¾ in.	#2,#3,#5	8 in.
3 ft.	5	16 in.	10 in.	#5,#7,#10	10 in.
4 ft.	6	20 in.	12 in.	#7,#10,#15	12 in.
5 ft.	6	24 in.	14 in.	#10,#15,#25	14 in.
6 ft.	7	30 in.	18 in.	#10,#15,#25	16 in.
8 ft.	8	36 in.	21 in.	#15,#25,#45	18 in.
10 ft.	9	44 in.	26 in.	#25,#45,#65	22 in.
12 ft.	10	52 in.	31in.	#45,#65,#95/100	24 in.

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REFORESTATION - PLANTING STANDARDS

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC5.6

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg EC5.6 REFORESTATION – PLANTING STANDARDS Oct 17, 2022 5:50pm by: bill.skebba
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GROUND COVER MAINTENANCE REQUIREMENTS

MAINTENANCE PROGRAMS SHALL BE SITE SPECIFIC AND COORDINATED WITH THE NATURAL AREAS CONTRACTOR AND MUNICIPALITY FOR ADEQUATE MAINTENANCE PROCEDURES. A FIVE YEAR STEWARDSHIP PROGRAM IS RECOMMENDED TO ENSURE PROPER ESTABLISHMENT AND HEALTH OF GROUND COVER, TO CONTROL INVASIVE SPECIES, AND TO PREVENT OVERGROWTH AND SHADING OF EQUIPMENT. AFTER THE FIFTH GROWING SEASON, PROGRAM MAY BE REDUCED TO TWO OR MORE VISITS PER YEAR DEPENDENT UPON SITE CONDITIONS AND ANY REQUIRED STRATEGIES TO MAINTAIN GOOD HEALTH OF THE SITE.

FIRST YEAR

SPRING:
-INSTALLATION PERFORMED IN THE SPRING.
SUMMER:
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA THROUGH PHYSICAL REMOVAL OR SPOT HERBICIDE TREATMENTS.
-CONDUCT MOWING AT LEAST ONCE DURING THE SUMMER, KEEPING NEWLY SEEDED AREAS 8-12 INCHES IN HEIGHT.
FALL:
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA THROUGH SPOT HERBICIDE TREATMENTS. IN AREAS LEFT BARE FROM HERBICIDE TREATMENT HAND SEED WITH THE RESPECTIVE SEED MIX.
-CONDUCT MOWING AT LEAST ONCE DURING THE FALL, KEEPING THE SEEDED AREAS 12 INCHES IN HEIGHT.

SECOND YEAR

SPRING:
-MOW DEAD STALKS AND SEED HEADS FROM THE PREVIOUS GROWING SEASON.
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA WITH AT LEAST ONE TO TWO SPOT HERBICIDE TREATMENTS.
-PLANT SUPPLEMENTAL SEED AS NEEDED TO ADDRESS AREAS OF POOR COVERAGE AND TO INCREASE COMPETITION AND BIO-DIVERSITY.
SUMMER:
-MOW SPENT COVER CROP TO KEEP NEAT APPEARANCE AND REDUCE SELF-SEEDING.
-CONDUCT MOWING AT LEAST TWICE DURING THE GROWING SEASON KEEPING VEGETATION AT 8-12 INCHES IN HEIGHT.
FALL:
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA WITH SPOT HERBICIDE TREATMENTS. IN AREAS LEFT BARE FROM HERBICIDE TREATMENT HAND SEED WITH THE RESPECTIVE SEED MIX.
-CONDUCT MOWING AT LEAST TWICE, KEEPING THE SEEDED AREAS 12 INCHES IN HEIGHT.

THIRD, FOURTH, AND FIFTH YEAR

SPRING:
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA THROUGH PHYSICAL REMOVAL OR SPOT HERBICIDE TREATMENTS.
SUMMER:
-CONDUCT MOWING IF TARGETED INVASIVE WOODY SPECIES ARE PREVALENT.
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA WITH AT LEAST ONE TO TWO SPOT HERBICIDE TREATMENTS.
FALL:
-CONTROL INVASIVE WOODY AND HERBACEOUS FLORA WITH AT LEAST ONE TO TWO SPOT HERBICIDE TREATMENTS.

PERFORMANCE STANDARDS

SATISFACTORY LANDSCAPE DEVELOPMENT ASSOCIATED WITH NATURALIZED VEGETATION WILL BE BASED ON THE FOLLOWING ITEMS.

FIRST YEAR:

WITHIN THREE MONTHS OF SEED INSTALLATION (OR THREE MONTHS AFTER THE START OF THE GROWING SEASON FOLLOWING DORMANT SEEDING), AT LEAST 90 PERCENT OF THE SEEDED AREA, AS MEASURED BY AERIAL COVER, WILL BE VEGETATED OR OTHERWISE STABILIZED AGAINST EROSION. THE COVER CROP MAY BE INCLUDED IN THIS MEASUREMENT.

SECOND YEAR:

BY THE END OF THE SECOND GROWING SEASON, THE PLANTED AREAS SHALL HAVE A MINIMUM OF 50 PERCENT GROUND COVER BY SPECIES IN THE APPROVED PLANT LIST.

THIRD YEAR:

BY THE END OF THE THIRD GROWING SEASON, THE PLANTED AREAS SHALL HAVE A MINIMUM OF 75 PERCENT GROUND COVER BY SPECIES IN THE APPROVED PLANT LIST.

SECOND AND THIRD YEAR ADDITIONAL PERFORMANCE STANDARDS:

- NATURALIZED LANDSCAPES SHALL NOT HAVE MORE THAN ONE SQUARE-METER DEVOID OF VEGETATION, AS MEASURED BY AERIAL COVERAGE.
- SEEDED/PLANTED AREAS (EXCLUDING EMERGENT ZONE) SHALL HAVE NO RILLS OR GULLIES GREATER THAN FOUR INCHES WIDE BY FOUR INCHES DEEP.
- AREAS SEEDED TO TURFGRASS OR LOW-MAINTENANCE TURF SHALL HAVE 95 PERCENT GROUND COVER.
- INSTALLED WOODY MATERIALS WITHIN THE NATURALIZED LANDSCAPE AREA SHALL BE ALIVE, IN HEALTHY CONDITION, AND REPRESENTATIVE OF THE SPECIES.

MONTH	VISITS BY CREW	SPOT-APPLIED HERBICIDE	BRUSH CLEARING	MOWING	MONITORING
APRIL	0-1	X	X		
MAY	1-2	X	X		X
JUNE	1-2	X		X	X
JULY	1-2	X			X
AUGUST	1-2	X		X	X
SEPTEMBER	0-1	X			X
OCTOBER	1-2	X	X	X	X
NOVEMBER	0-1	X	X		X
DECEMBER - MARCH	0-1	X	X		

TREE / SHRUB ESTABLISHMENT

PREPARATION

HOLES DUG FOR TREES AND SHRUBS SHALL BE NO DEEPER THAN THE ROOTBALL OR CONTAINER, MEASURED TO THE TRUNK FLARE. DIAMETER OF HOLES SHALL BE TWICE THE DIAMETER OF THE ROOT BALL FOR TREES, AND AT MINIMUM 6 INCHES BEYOND THE DIAMETER OF CONTAINERS FOR SHRUBS.

INSTALLATION

INSTALL TREES AND SHRUBS SO THAT THE TRUNK FLARE IS AT A MAXIMUM 2 INCHES ABOVE GRADE, AND AT MINIMUM, AT GRADE. REMOVE CONTAINER AND REMOVE ANY BURLAP 6 INCHES FROM THE HEIGHT OF THE ROOT BALL, THEN BACKFILL TO FINISHED GRADE USING EXCAVATED OR AMENDED SOIL FROM THE DUG HOLE.

SEED AREA ESTABLISHMENT

PREPARATION

SOIL PH IS TO BE TESTED PRIOR TO AMENDMENT AND FINAL GRADING. LIME OR SULFUR IS TO BE ADDED IN APPROPRIATE QUANTITY TO BRING PH TO ACCEPTABLE LEVELS FOR SEED APPLICATION AS NEEDED. IN AREAS OF SOIL AMENDMENT, SOIL IS RECOMMENDED TO BE MIXED, DISKED, CULTIVATED, AND ROLLED AS NEEDED. SOILS SHALL BE UNIFORM, WITHOUT EXCESSIVE FURROWS, RUTS, OR RIDGES, AND LOW AREAS WHERE WATER MAY COLLECT. SOIL PREPARATION SHALL OCCUR WHEN WEATHER PERMITS AND TIMING ALLOWS FOR AT LEAST A FOLLOWING 48 HOURS WHERE SEEDING AND STABILIZATION METHODS MAY TAKE PLACE.

TIMING

SEEDING SHALL BEGIN NO LATER THAN 48 HOURS AFTER FINAL SITE GRADING TO UTILIZE EXISTING SOIL MOISTURE, BEFORE SURFACE DRYING OCCURS. ALL POST-GRADING SITE STABILIZATION METHODS SHALL BE APPLIED DURING THE 48 HOUR TIME PERIOD. IN ORDER TO MINIMIZE INITIAL USES OF BROAD APPLICATION HERBICIDE TREATMENT, AND PROMOTE EARLY AND STRONG ESTABLISHMENT OF SPECIFIED SEED MIXES WITH MINIMAL UNDESIRABLE WEED COMPETITION, DORMANT SEEDING SHOULD BE UTILIZED AS SITE CONDITIONS AND CONSTRUCTION TIMELINE PERMITS. IF ACTIVE SEASON SEEDING SHOULD BE REQUIRED, IT IS RECOMMENDED TO DO SO BETWEEN APRIL 1ST AND MAY 30TH, AFTER RISK OF MAJOR FREEZING CONDITIONS IS MINIMIZED. COVER CROPS MAY BE SEEDED AT ANY TIME IN THE EVENT THAT STABILIZATION IS REQUIRED OUTSIDE OF RECOMMENDED PLANTING TIMES. COVER CROPS MAY BE REQUIRED TO BE IRRIGATED IF APPLIED DURING WARM SEASONS AND IF ADEQUATE SOIL MOISTURE IS NOT PRESENT.

APPLICATION

SEED MIXTURES SHALL BE MECHANICALLY DRILLED, BROADCAST, OR HYDROSEEDED WITH STRAW MULCH PER SUPPLIER'S RECOMMENDATION (IF APPLICABLE). NO STRAW MULCH IS REQUIRED IF DRILL APPLIED, UNLESS NEEDED FOR STEEP SLOPES, SOIL STABILIZATION, OR OTHER AREAS THAT ARE IDENTIFIED FOR EROSION PREVENTION. SEED SHALL BE APPLIED AT INDICATED RATES WITH COVER CROP OATS, JAPANESE MILLET, WINTER PEA, OR ANNUAL RYE DEPENDENT ON SEASON AND SOIL CONDITIONS, AT A RATE OF 30 LBS PER ACRE (UNLESS OTHERWISE STATED IN THE SPECIFIC SEED MIXTURE NOTES). SEED SPECIES SHALL BE LOCALLY SOURCED WHEN FEASIBLE. FINAL SEED MIX MAY VARY DEPENDENT UPON SPECIFIC SPECIES AVAILABILITY AND TIME OF INSTALLATION. FINAL SEED MIX SHALL BE APPROVED BY OWNER, OWNER'S REPRESENTATIVE, OR LANDSCAPE ARCHITECT. IF SEEDING IS DISTURBED BEFORE FINAL CONSTRUCTION, ADDITIONAL SEED MAY BE APPLIED BY A LOW SPREADER IN AREAS THAT WERE DISTURBED. SITE SHOULD BE MONITORED FOLLOWING INSTALLATION FOR AREAS IDENTIFIED FOR ADDITIONAL RESEEDING UNTIL SEED MIX IS SUFFICIENTLY ESTABLISHED.

INVASIVE WEED CONTROL, MONITORING, AND MANAGEMENT

AND A WORK PLAN SHOULD BE DEVELOPED TO AVOID THE SPREAD OF INVASIVE PLANTS FROM THESE AREAS. IF SUBSTANTIAL AREAS OF INVASIVE HERBACEOUS SPECIES ARE FOUND PRIOR TO OR AFTER PROJECT DEVELOPMENT, FOLIAR OR BROADCAST HERBICIDE APPLICATIONS MAY BE REQUIRED. FOR INVASIVE TREES, SHRUBS, AND VINES, MANAGEMENT MAY REQUIRE CUT-STEM HERBICIDE TREATMENTS.
ALL INVASIVE SPECIES MANAGEMENT SHOULD BE CONDUCTED DURING THE SUMMER MONTHS WHILE THE TARGET PLANTS ARE ACTIVELY GROWING.
TREATMENTS SHOULD BE CONDUCTED BETWEEN JULY AND AUGUST OF EACH YEAR AND SHOULD BE SEPARATED BY AT LEAST TWO WEEKS. APPROXIMATELY TWO HERBICIDE TREATMENTS SHOULD BE SCHEDULED PER SEASON FOR AT LEAST TWO YEARS FOLLOWING INITIATION OF PROJECT WORK. HERBICIDE USE REPORTING WILL ADHERE TO ALL APPLICATOR LICENSING REQUIREMENTS.

1 MAINTENANCE AND PERFORMANCE STANDARDS

NTS

1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING MATERIALS AND PLANTS SHOWN ON THE LANDSCAPE PLAN. THE CONTRACTOR IS RESPONSIBLE FOR THE COST TO REPAIR UTILITIES, ADJACENT LANDSCAPE, PUBLIC AND PRIVATE PROPERTY THAT IS DAMAGED BY THE CONTRACTOR OR THEIR SUBCONTRACTOR'S OPERATIONS DURING INSTALLATION OR DURING THE SPECIFIED MAINTENANCE PERIOD. CALL FOR UTILITY LOCATIONS PRIOR TO ANY EXCAVATION.
2. THE CONTRACTOR SHALL REPORT ANY DISCREPANCY IN PLAN VS. FIELD CONDITIONS IMMEDIATELY TO THE LANDSCAPE ARCHITECT, PRIOR TO CONTINUING WITH THAT PORTION OF WORK.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY OF THEIR TRENCHES OR EXCAVATIONS THAT SETTLE.
5. ALL PLANTS TO BE SPECIMEN GRADE, WELL BRANCHED, HEALTHY, FULL, PRE-INOCULATED AND FERTILIZED. PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, AND SCARS. PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES. PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES. TRUNKS WILL BE WRAPPED IF NECESSARY TO PREVENT SUN SCALD AND INSECT DAMAGE. THE LANDSCAPE CONTRACTOR SHALL REMOVE THE WRAP AT THE PROPER TIME AS PART OF THIS CONTRACT.
6. THE OWNER'S REPRESENTATIVE MAY REJECT ANY PLANT MATERIALS THAT ARE DISEASED, DEFORMED, OR OTHERWISE NOT EXHIBITING SUPERIOR QUALITY.
7. ALL NURSERY STOCK SHALL BE GUARANTEED, BY THE CONTRACTOR, FOR ONE YEAR FROM DATE OF FINAL INSPECTION. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNERS WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
8. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
9. PRUNE PLANTS AS NECESSARY- PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
10. PLANTING AREA TOPSOIL SHALL BE AMENDED WITH 25% SPHAGNUM PEATMOSS, 5% HUMUS AND 70% PULVERIZED SOIL FOR ALL NON TURF SEED MIX AREAS, SHRUB, ORNAMENTAL GRASS, PERENNIAL BEDS.
11. SEED LIMIT LINES ARE APPROXIMATE. CONTRACTOR SHALL SEED ALL AREAS WHICH ARE DISTURBED BY GRADING WITH THE SPECIFIED SEED MIXES.
12. EDGING TO BE A SPADED EDGE UNLESS INDICATED OTHERWISE ON THE PLANS. SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. A SPADED BED EDGE SHALL SEPARATE MULCH BEDS FROM TURF OR SEEDED AREAS. A SPADED EDGE IS NOT REQUIRED ALONG CURBED EDGES.
13. CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD MULCH AT A 3" DEPTH TO ALL TREES, SHRUB, PERENNIAL, AND GROUNDCOVER AREAS. TREES PLACED IN AREA COVERED BY TURF SHALL RECEIVE A 4 FT WIDE MAXIMUM TREE RING WITH 3" DEPTH SHREDDED HARDWOOD MULCH.
14. TREES SHALL NOT BE LOCATED CLOSER THAN 5' FROM UNDERGROUND UTILITY LINES AND NO CLOSER THAN 10' FROM UTILITY STRUCTURES.
15. DO NOT DISTURB THE EXISTING PAVING, LIGHTING, OR LANDSCAPING THAT EXISTS ADJACENT TO THE SITE UNLESS OTHERWISE NOTED ON PLAN.
16. ALL DISTURBED AREAS TO BE SEEDED, UNLESS OTHERWISE NOTED. SEED SHALL BE LOCAL HARDY TURF GRASS MIX UNLESS, OTHERWISE NOTED.
17. PLANT QUANTITIES SHOWN ARE FOR THE CONVENIENCE OF THE OWNER AND JURISDICTIONAL REVIEW AGENCIES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLANT QUANTITIES AS DRAWN.
18. THE CONTINUED MAINTENANCE OF ALL REQUIRED LANDSCAPING SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY ON WHICH SAID MATERIALS ARE REQUIRED. ALL PLANT MATERIALS REQUIRED BY THIS SECTION SHALL BE MAINTAINED AS LIVING VEGETATION AND SHALL BE PROMPTLY REPLACED IF THE PLANT MATERIAL HAS DIED PRIOR TO FINAL ACCEPTANCE. PLANTING AREAS SHALL BE KEPT FREE OF TRASH, LITTER, AND WEEDS AT ALL TIMES.

2 LANDSCAPE NOTES

NTS

NATURAL AREA NOTES

1. ALL WORK DEEMED NATURAL AREA TO BE SEEDED OR PLANTED SHALL BE PERFORMED BY A NATURALS AREA CONTRACTOR WITH AT LEAST 5 YEARS OF DOCUMENTED EXPERIENCE IN SELECTIVE BRUSH CLEARING, PLANTING OF NATIVE SPECIES, AND NATURAL AREAS MANAGEMENT FOR THE PURPOSE OF ECOLOGICAL RESTORATION, AND SHALL BE ABLE TO DEMONSTRATE THERE KNOWLEDGE THROUGH REFERENCES AND IN THE FIELD.
2. SEED LIMIT LINES ARE APPROXIMATE. THE NATURAL AREAS CONTRACTOR SHALL SEED ALL AREAS WHICH ARE DISTURBED BY GRADING WITH THE SPECIFIED SEED/PLUG MIXES.
3. SEED, LIVE PLUGS, OR BARE ROOT PLANTS SHALL BE OBTAINED FROM SOURCES SPECIALIZING IN NATIVE SPECIES. SEED AND PLANT STOCK SHALL BE SOURCED NO MORE THAN 350 MILES FROM THE JOB SITE.
4. ALL SEED MIXES SHALL BE INSTALLED WITH A GRANULAR FORM OF ENDOMYCORRHIZAL INOCULUM PER THE SUPPLIERS SPECIFICATIONS. COVER CROP IS TO BE APPLIED TO ALL SEED MIXES CONSISTING ONLY OF AVENA SATIVA (SEED OATS) FOR SPRING INSTALLATIONS OR REGREEN (WHEAT HYBRID) FOR FALL PLANTINGS. NO OTHER COVER CROP IS TO BE USED ON SITE.
5. STANDARD EROSION CONTROL BLANKET SHALL BE APPLIED TO ALL SEEDED AREAS WITH SINGLE TO DOUBLE NET STRAW AND DOUBLE NET STRAW/COCONUT BLANKET HYDROSEEDING IS UNACCEPTABLE.
6. LIVE PLUG AND BARE ROOT INSTALLATION SHALL BE ACCOMPANIED BY GOOSE EXCLOSURE FOR UP TO 12 MONTHS AFTER INSTALLATION. NATURAL AREAS CONTRACTOR TO REMOVE AT OWN EXPENSE AFTER 12 MONTHS.
7. STEWARDSHIP OF THE NATURAL AREA SHALL BE CONDUCTED BY A NATURAL AREAS CONTRACTOR TO BEGIN IMMEDIATELY AFTER INSTALLATION FOR THREE YEARS.

3 NATURAL AREA NOTES

NTS

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REFORESTATION-NOTES

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
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EC5.7

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\REFORESTATION SUMMARY TABLE.dwg EC5.7 REFORESTATION- NOTES Oct 17, 2022 5:50pm by: bill.skebba
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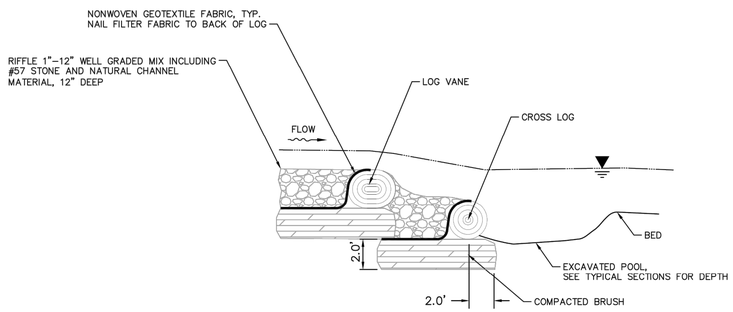
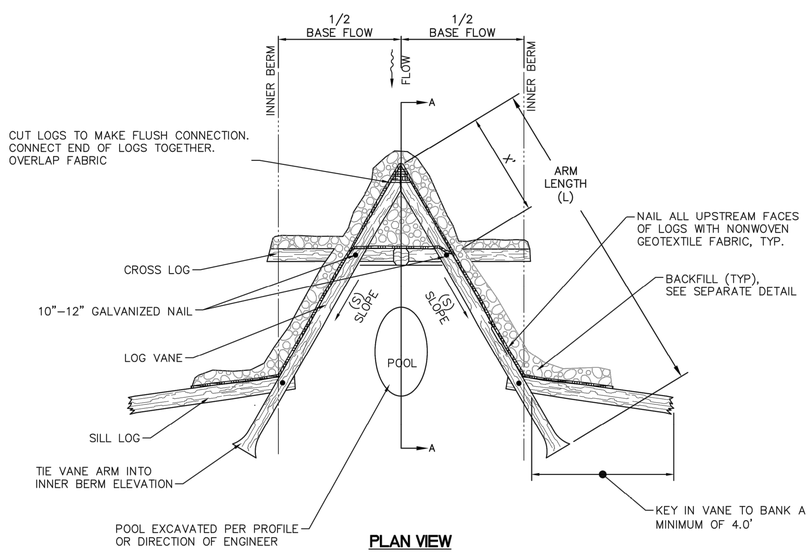


SECTION A-A

REACH	WBRR TRIB
ARM LENGTH (L)	15'
ARM TIE–IN HEIGHT	0.3'
ARM SLOPE (S)	1.0%–2.0%
STEP SPACING (X)	5'

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO THE BANK.
2. BACKFILL MIX TO BE USED TO REDUCE VOIDS BETWEEN LOGS.
3. ALL LOGS TO BE HARDWOOD SPECIES, 8"–10" DIAMETER MINIMUM.



PLAN VIEW

LOG CROSS VANE

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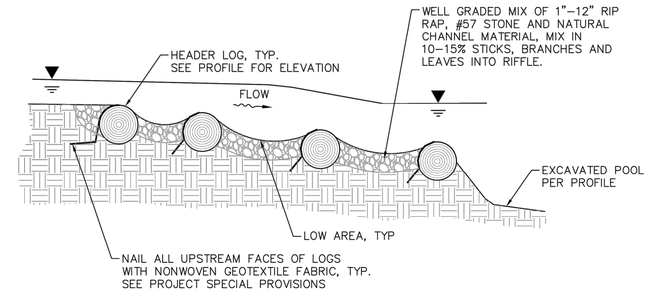
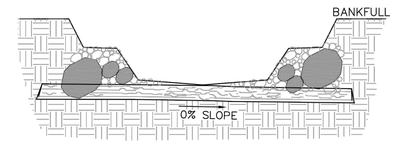
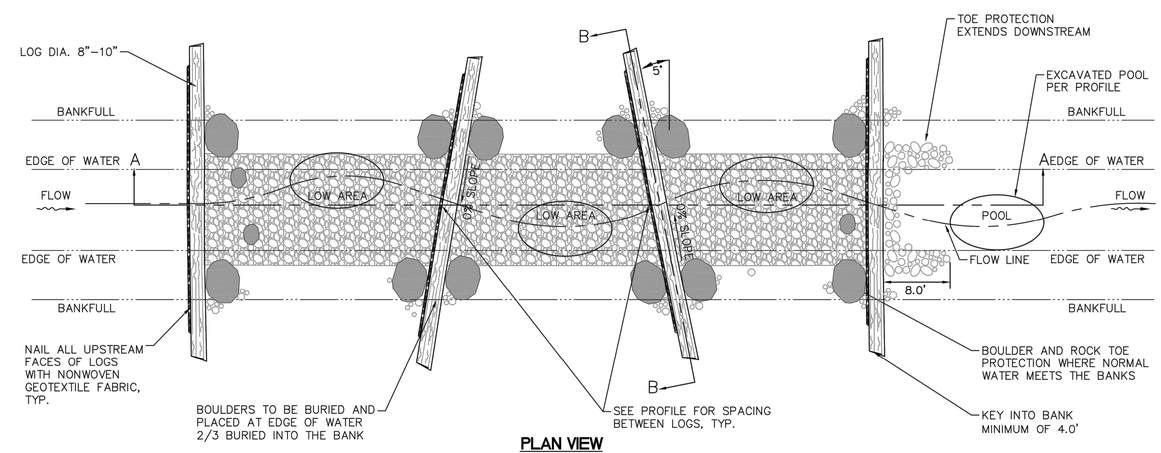


SECTION A-A



SECTION B-B

NOTES:
1. PLACE FABRIC ON THE UPSTREAM SIDE OF THE MOST UPSTREAM LOG SILL IN THE CONSTRUCTED RIFFLE.
2. BOULDERS SHALL BE USED TO ANCHOR LOGS IF NEEDED.
3. LOG SILLS SHALL OVERLAP AND ANCHOR THE LOG SILL DIRECTLY UPSTREAM.
4. THE LOG SILL SHALL ALL BE DESIGNED TO BE SUBMERGED OR COVERED AT LOW FLOWS.
5. BOULDERS SHALL BE 18" MIN.
6. AFTER ENGINEER HAS ACCEPTED STRUCTURE, THE NONWOVEN GEOTEXTILE FABRIC SHOULD BE TRIMMED TO MINIMIZE THE AMOUNT VISIBLE ON TOP OF LOG.



PLAN VIEW

LOG AND ROCK RIFFLE

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DETAILS

STREAM CORRIDOR PROTECTION ZONE REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\DETAILS.dwg DETAILS Oct 17, 2022 5:50pm by: billsekebbo
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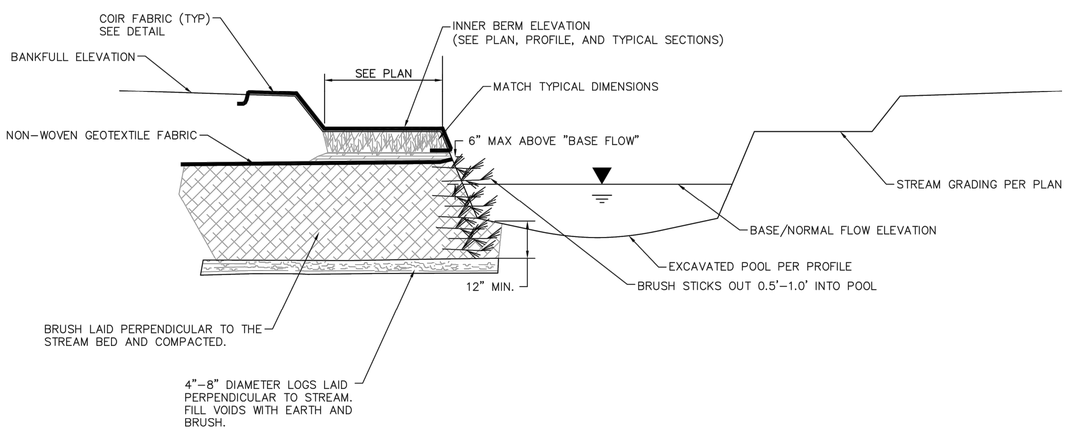
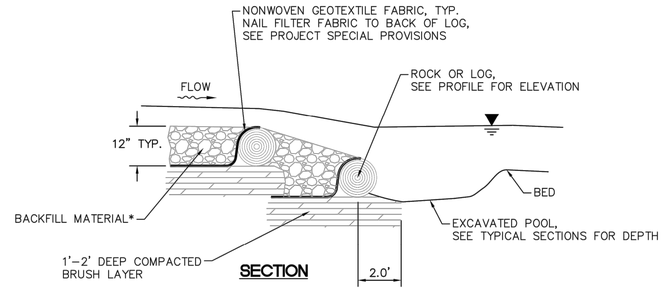




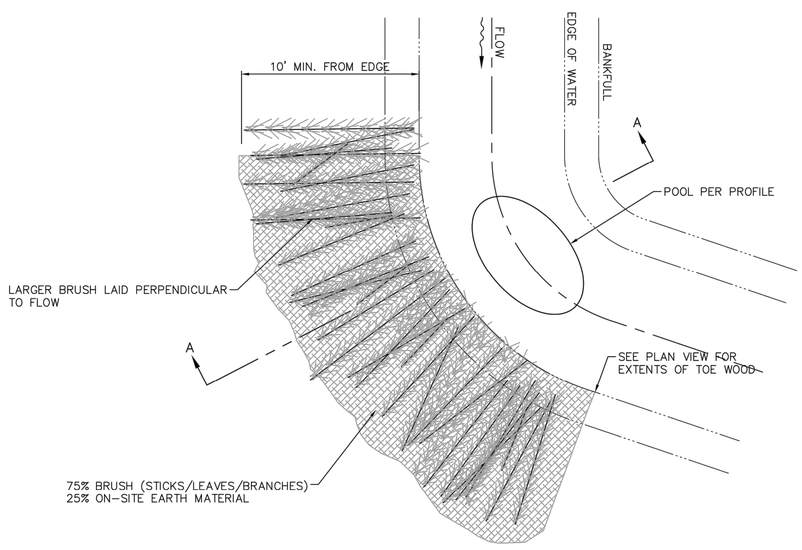
*BACKFILL MATERIAL (WELL GRADED MIX)	
1"-12" RIP RAP	75%
ON-SITE COBBLE AND GRAVEL	10%
#57 STONE	10%
MULCH (FROM ON-SITE)	5%

% IS MEASURED BY VOLUME

*BRUSH LAYER TO BE LAID PERPENDICULAR TO FLOW

LOG STRUCTURE BACKFILL DETAIL

NOT TO SCALE



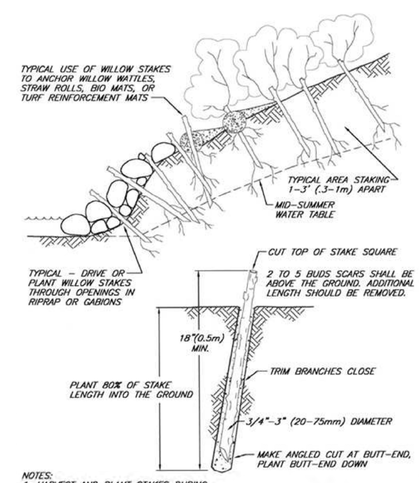
NOTE:

1. BRUSH SHALL BE A VARIETY OF DIAMETERS AND SHALL BE LAID GENERALLY PERPENDICULAR TO FLOW AND COMPACTED BY DIRT.
2. FIRST LAYER OF BRUSH SHALL BE A BED OF 3" LIMBS/BRUSH SET 18" MIN. BELOW THE BED.
3. LAYERS ABOVE 1st LAYER SHALL BE 75% BRUSH OF A VARIETY OF SIZES WITH 25% ON SITE MATERIAL FILLING VOIDS.
4. BRUSH BROUGHT UP IN LIFTS.
5. GRADING ABOVE THE TOE WOOD PER THE TYPICAL SECTION AND/OR GRADING PLAN.

PLAN VIEW

TOE WOOD

NOT TO SCALE



NOTES:
1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION. USE A PILOT BAR IN FIRM SOILS.
4. SOAK CUTTINGS FOR 24 HOURS (MIN.) PRIOR TO INSTALLATION.
5. TAMP THE SOIL AROUND THE STAKE.

LIVE STAKING

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DETAILS

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE:
10/17/2022

KHA PROJECT NO.
190118000

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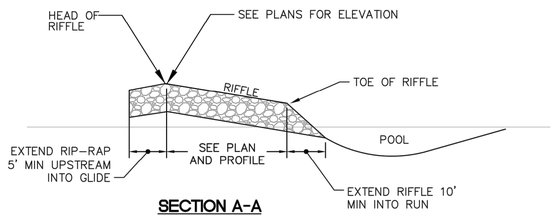
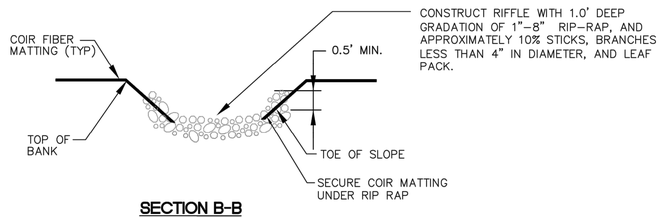


SECTION A-A



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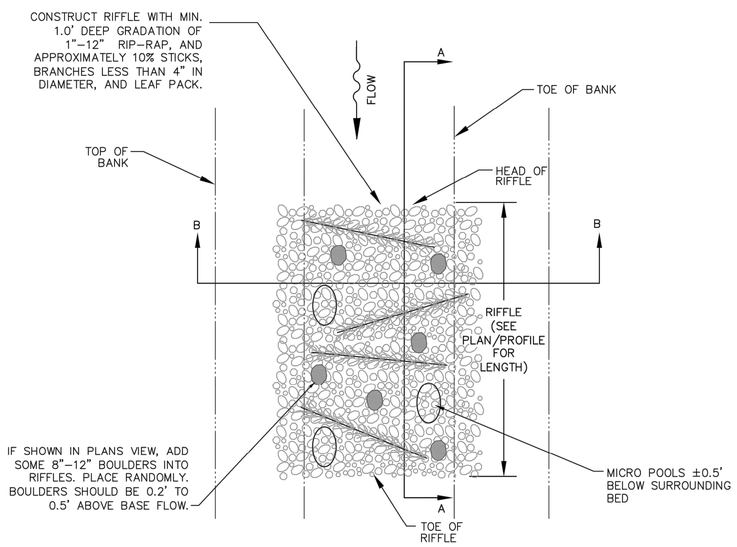

PLAN VIEW

NOTES:

1. MAJORITY OF BRUSH SHOULD BE AT 0.5"-2.0" IN DIAMETER AND NO LARGER THAN 6" AND EXTEND INTO THE BANK 2 FEET ON EACH SIDE. WOOD MATERIAL SHALL BE VARYING DIAMETER TO ALLOW MATERIAL TO BE COMPACTED.

CONSTRUCTED RIFFLE

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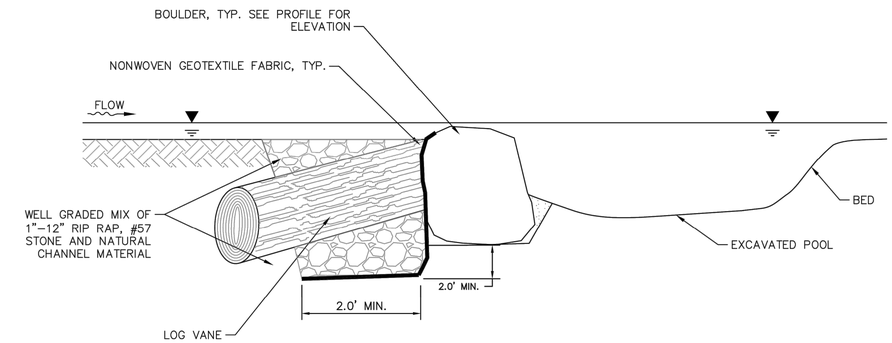

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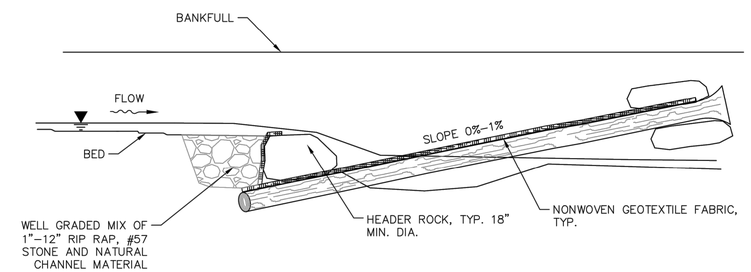

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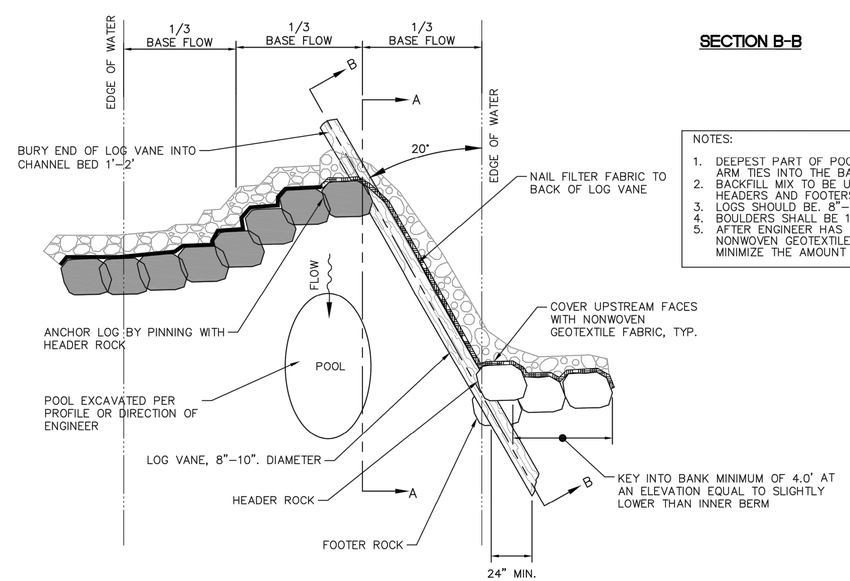

PLAN VIEW

NOTES:

1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO THE BANK.
2. BACKFILL MIX TO BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
3. LOGS SHOULD BE. 8"-12" DIAMETER.
4. BOULDERS SHALL BE 18" DIAMETER.
5. AFTER ENGINEER HAS ACCEPTED STRUCTURE, THE NONWOVEN GEOTEXTILE FABRIC SHOULD BE TRIMMED TO MINIMIZE THE AMOUNT VISIBLE ON TOP OF LOG.

LOG J-HOOK

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STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\DETAILS.dwg Layout1 (3) Oct 17, 2022 5:50pm by: bill.skebba
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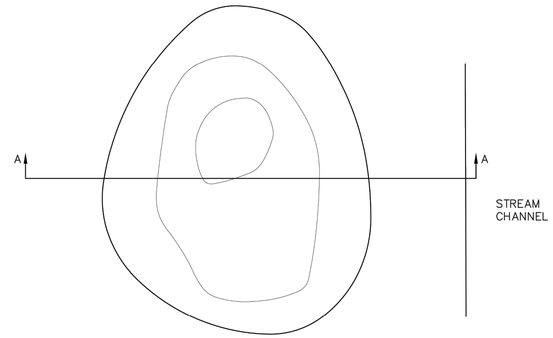

PLAN

SECTION A-A

NOTE:
FOR SIZE AND SHAPE SEE PLAN VIEWS.

VERNAL POOL DETAIL

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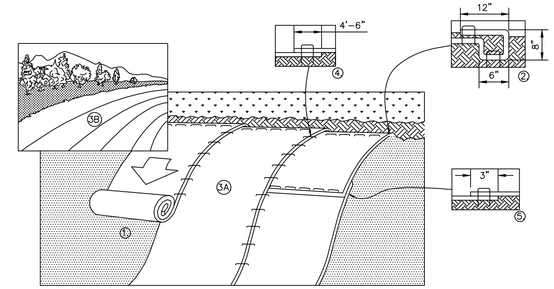

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH AS SHOWN IN DETAIL 2. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS PER MANUFACTURES RECOMMENDATION.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MINIMUM 6" OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. PLACE STAPLES/STAKES PER MANUFACTURER'S RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

NOTES:
1. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.
2. FOLLOW EROSION CONTROL TECHNOLOGY COUNCIL SPECIFICATION FOR PRODUCT SELECTION.
3. PERVIOUS LAND WITH SLOPES RUNNING GREATER THAN OR EQUAL TO 4:1 SHALL CONTAIN SLOPE STABILIZATION BLANKET
4. ALL BLANKETS SHALL BE INSPECTED REGULARLY AFTER INSTALLATION, ESPECIALLY AFTER STORMS TO CHECK FOR EROSION OR UNDERMINING OF THE PRODUCT. MAKE NEEDED REPAIRS IMMEDIATELY, ADDRESSING RILLS OR GULLIES THAT HAVE DEVELOPED PRIOR TO REPLACING THE R.E.C.P.. IN THE CASE EROSION REPAIRS, ASSURE THAT SUBSEQUENT RUNOFF ACROSS THE AREA IS DISPERSED OR ADEQUATELY SPREAD
5. ALL BLANKETS SHALL MEET THE SPECIFICATIONS BELOW:

MATERIAL	MAXIMUM LENGTH OF PROTECTION
SRAW	10-12 MONTHS
STRAW/COCONUT	24 MONTHS
COCONUT	36 MONTHS
EXCELSIOR	36 MONTHS

EROSION CONTROL BLANKET

NOT TO SCALE

TREE PLANTING DETAIL

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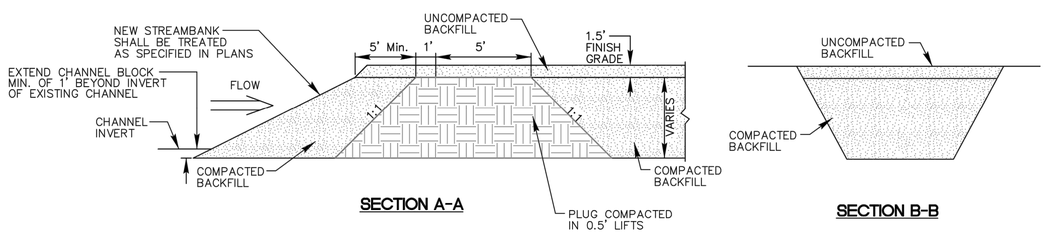
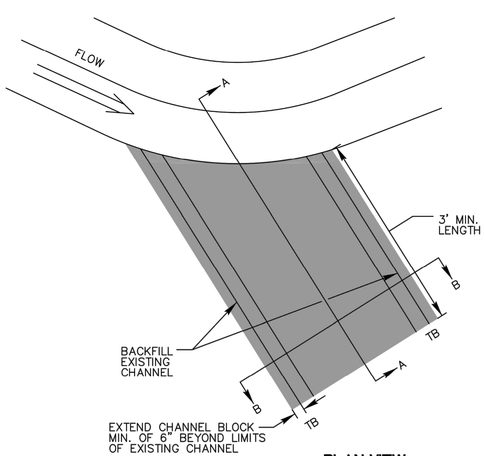


SECTION A-A **SECTION B-B**



PLAN VIEW

NOTES:
1. BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 1' BELOW THE INVERT OF THE EXISTING CHANNEL.
2. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

CHANNEL BLOCK

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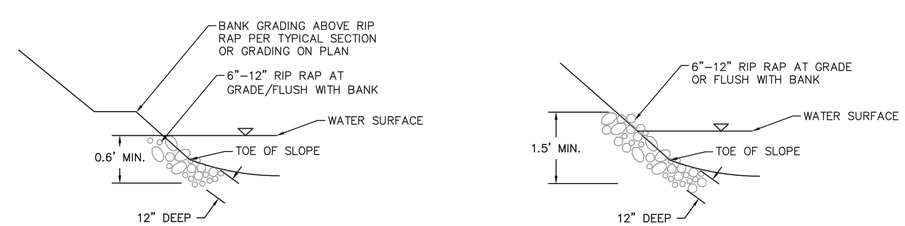

RIFFLE SECTION **POOL SECTION**

ROCK TOE PROTECTION

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CHECKED BY: JMM

DETAILS

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

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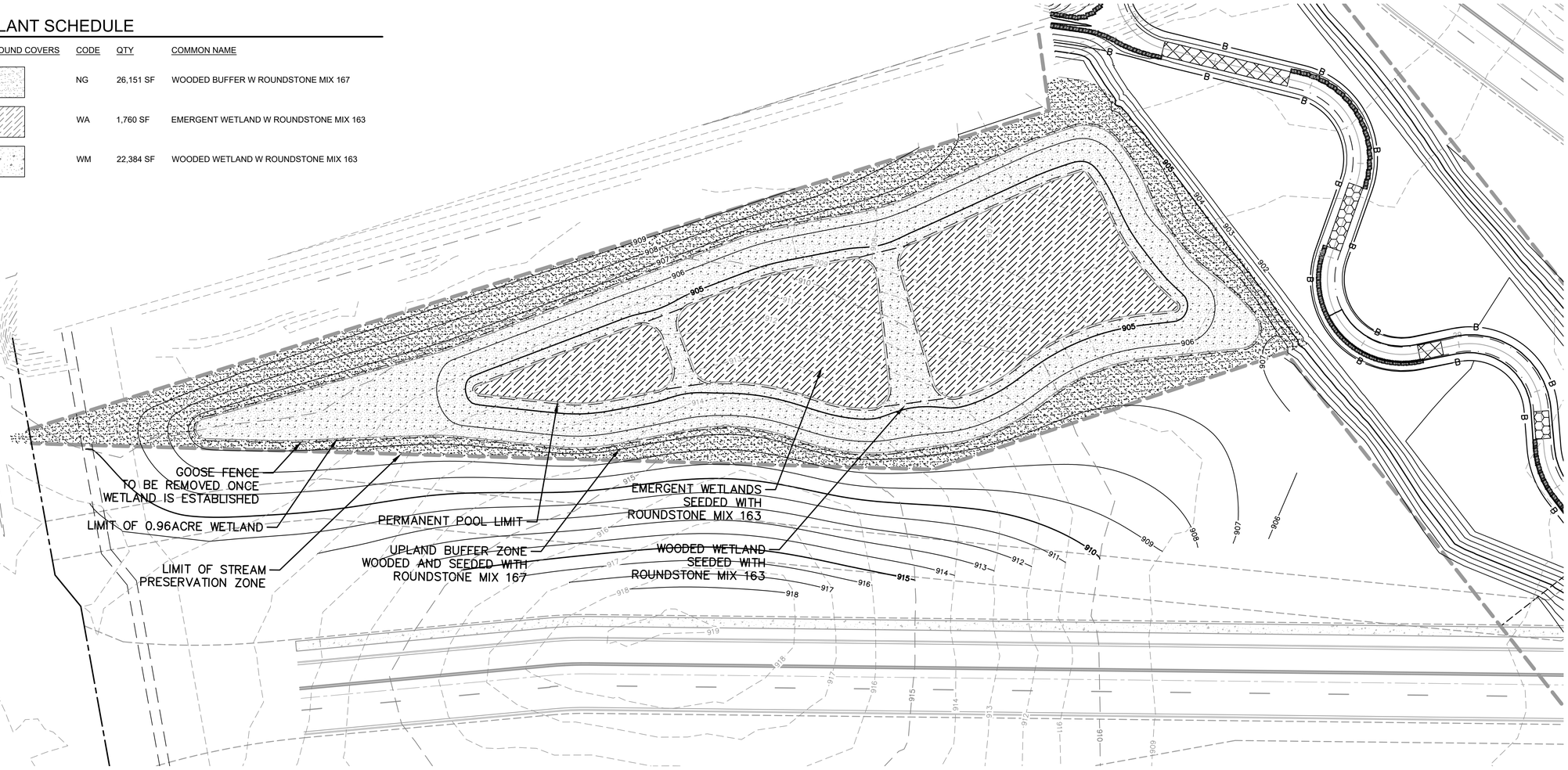
PLANT SCHEDULE

GROUND COVERS	CODE	QTY	COMMON NAME
	NG	26,151 SF	WOODED BUFFER W ROUNDSTONE MIX 167
	WA	1,760 SF	EMERGENT WETLAND W ROUNDSTONE MIX 163
	WM	22,384 SF	WOODED WETLAND W ROUNDSTONE MIX 163



SEE PLANTING NOTES ON PG EC7.1

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WETLAND PLANTING PLAN

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
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WETLAND PLANTING NOTES

A MINIMUM OF 400 NATIVE, LIVE, AND HEALTHY (DISEASE AND PEST FREE) WOODY PLANTS PER ACRE WITHIN THE WOODED WETLAND PORTION (OF WHICH AT LEAST 200 ARE TREE SPECIES) WILL BE PRESENT AT THE END OF THE MONITORING PERIOD.

A MINIMUM OF 400 NATIVE, LIVE, AND HEALTHY (DISEASE AND PEST FREE) WOODY PLANTS PER ACRE WITHIN THE UPLAND BUFFER (OF WHICH AT LEAST 200 ARE TREE SPECIES) WILL BE PRESENT AT THE END OF THE MONITORING PERIOD.

THE MITIGATION WETLAND MUST CONTAIN AT LEAST 75% RELATIVE COVER OF NATIVE PERENNIAL HYDROPHYTES AND LESS THAN 10% OPEN WATER.

MITIGATION WETLAND WILL HAVE LESS THAN 5% RELATIVE COVER OF ALL NON-TYPHA INVASIVE PLANT SPECIES LISTED IN APPENDIX 7 OF THE GUIDELINES FOR MITIGATION BANKING IN OHIO. DUE TO THE DIFFICULTY OF DISTINGUISHING THE THREE SPECIES OF CATTAILS, AS WELL AS THE LIKELIHOOD THAT AT LEAST ONE OF THESE WILL BE PRESENT IN MANY TYPES OF OHIO WETLANDS, THE RELATIVE COVER OF ALL INVASIVE SPECIES, INCLUDING TYPHA SPP., WILL BE LESS THAN 10%.

MITIGATION WETLAND WILL BE SEEDED TO BE 50 HERBACEOUS PLANTS PER 200 SQUARE FEET.

INSTALLATION OF HERBACEOUS PLANTS SHALL BE DONE BETWEEN AVERAGE LAST FROST (APRIL 29TH) AND SEVERAL WEEKS BEFORE AVERAGE FIRST FROST (OCTOBER 27TH).

ALL LANDSCAPE REINFORCEMENT PLANS SHALL BE SIGNED BY A REGISTERED LANDSCAPE ARCHITECT WITH DIRECTION PROVIDED BY AN EXPERIENCED WETLAND SCIENTIST.

IF A MINIMUM VEGETATIVE COVERAGE OF 50% IS NOT ACHIEVED IN THE PLANTED WETLAND ZONES AFTER THE SECOND GROWING SEASON, A REINFORCEMENT PLANTING WILL BE REQUIRED.

REPAIR ALL DAMAGE TO PROPERTY FROM PLANTING OPERATIONS AT NO COST TO OWNER.

WEEDING, LANDSCAPE MAINTENANCE, AND WATERING TO BE CONTRACTOR'S RESPONSIBILITY DURING CONSTRUCTION. ALL PLANT MATERIALS REQUIRED BY THIS SECTION SHALL BE MAINTAINED AS LIVING VEGETATION AND SHALL BE PROMPTLY REPLACED BY CONTRACTOR DURING WARRANTY PERIOD IF PLANT MATERIAL DIES BEFORE ACCEPTANCE.

PLANTING AREAS TO BE KEPT FREE OF TRASH, LITTER, AND WEEDS AT ALL TIMES.

THE CONTINUED MAINTENANCE OF ALL REQUIRED LANDSCAPING AFTER THE WARRANTY PERIOD OR MONITORING PERIOD (WHICHEVER IS GREATER) EXPIRES SHALL THE RESPONSIBILITY OF THE OWNER.

ALL PLANTS TO BE SPECIMEN GRADE, OHIO-GROWN AND/OR HARDY. SPECIMEN GRADE SHALL ADHERE TO, BUT IS NOT LIMITED BY, THE FOLLOWING STANDARDS:
ALL PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, SCARS, ETC.
ALL PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES.
ALL PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES.
ALL PLANTS SHALL HAVE HEAVY, HEALTHY BRANCHING AND LEAFING.
THE OWNERS REPRESENTATIVE MAY REJECT PLANT MATERIALS NOT EXHIBITING SUPERIOR QUALITY.

NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.

ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SUBMISSION OF ANY BID AND/OR QUOTE BY THE LANDSCAPE CONTRACTOR.

GOOSE FENCE WILL BE INSTALLED BEFORE PLANTING TO BE REMOVED ONCE WETLAND IS ESTABLISHED. FENCE SHOULD BE CHECKED OCCASIONALLY TO ENSURE INTEGRITY AND CHECK FOR TRAPPED WILDLIFE.

MITIGATION WETLAND SPECIES TABLE

COMMON NAME	SCIENTIFIC NAME	QUANTITY	CONTAINER SIZE	CONTAINER TYPE	PLANTING WIN	ACREAGE
WETLAND SEED MIX ROUNDSTONE MIX 163 - 8.75 PLS pounds/acre						0.82 ACRES
VIRGINIA WILD RYE	ELYMUS VIRGINICUS		N/A	SEED MIX	4/29 - 9/27	
AMERICAN MANNA	GLYCERIA GRANDIS		N/A	SEED MIX	4/29 - 9/27	
BARNYARD GRASS	ECHINOCHLOA MURICATA		N/A	SEED MIX	4/29 - 9/27	
RED TOP PANICUM	PANICUM RIGIDULUM		N/A	SEED MIX	4/29 - 9/27	
HOP SEDGE	CAREX LUPULINA		N/A	SEED MIX	4/29 - 9/27	
SHALLOW SEDGE	CAREX LURIDA		N/A	SEED MIX	4/29 - 9/27	
FOX SEDGE	CAREX VULPINOIDEA		N/A	SEED MIX	4/29 - 9/27	
NODDING SEDGE	CAREX CRINITA		N/A	SEED MIX	4/29 - 9/27	
MANY LEAVED BUL	SCIRPUS POLYPHYLLUS		N/A	SEED MIX	4/29 - 9/27	
PENNSYLVANIA SMA	POLYGONUM PENSYLVANICUM		N/A	SEED MIX	4/29 - 9/27	
BUTTON BUSH	CEPHALANTHUS OCCIDENTALIS		N/A	SEED MIX	4/29 - 9/27	
OHIO SPIDERWORT	TRADESCANTIA OHIENSIS		N/A	SEED MIX	4/29 - 9/27	
FALSE SUNFLOWER	HELIOPSIS HELIANTHOIDES		N/A	SEED MIX	4/29 - 9/27	
SAWTOOTH SUNFLO	HELIANTHUS GROSSESERRATUS		N/A	SEED MIX	4/29 - 9/27	
AMERICAN SENNA	SENNA HEBECARPA		N/A	SEED MIX	4/29 - 9/27	
CUP PLANT	SILPHIUM PERFOLIATUM		N/A	SEED MIX	4/29 - 9/27	
SHOWY TICKSEED	BIDENS ARISTOSA		N/A	SEED MIX	4/29 - 9/27	
SWAMP MILKWEED	ASCLEPIAS INCARNATA		N/A	SEED MIX	4/29 - 9/27	
SNEEZEWEED	HELENIUM AUTUMNALE		N/A	SEED MIX	4/29 - 9/27	
GIANT BUR REED	SPARGANIUM EURYCARPUM		N/A	SEED MIX	4/29 - 9/27	
NATIVE SEED MIX ROUNDSTONE MIX 167 - 9.75 PLS pounds/acre						0.6 ACRES
FOWL BLUEGRASS	POA PALUSTRIS		N/A	SEED MIX	4/29 - 9/27	
TICKLE GRASS	AGROSTIS SCABRA		N/A	SEED MIX	4/29 - 9/27	
CANADA WILD RYE	ELYMUS CANADENSIS		N/A	SEED MIX	4/29 - 9/27	
BARNYARD GRASS	ECHINOCHLOA MURICATA		N/A	SEED MIX	4/29 - 9/27	
BIG BLUESTEM	ANDROPOGON GERARDII		N/A	SEED MIX	4/29 - 9/27	
DEER TONGUE GRA	PANICUM CLANDESTINUM		N/A	SEED MIX	4/29 - 9/27	
FALL PANICUM	PANICUM ANCEPS		N/A	SEED MIX	4/29 - 9/27	
SWITCHGRASS	PANICUM VIRGATUM		N/A	SEED MIX	4/29 - 9/27	
OHIO SPIDERWORT	TRADESCANTIA OHIENSIS		N/A	SEED MIX	4/29 - 9/27	
AMERICAN SENNA	SENNA HEBECARPA		N/A	SEED MIX	4/29 - 9/27	
WHITE SNAKEROOT	EUPATORIUM RUGOSUM		N/A	SEED MIX	4/29 - 9/27	
LANCE-LEAVED GO	CUTHAMIA GRAMINIFOLIA		N/A	SEED MIX	4/29 - 9/27	
FALSE SUNFLOWER	HELIOPSIS HELIANTHOIDES		N/A	SEED MIX	4/29 - 9/27	
CUP PLANT	SILPHIUM PERFOLIATUM		N/A	SEED MIX	4/29 - 9/27	
SWAMP MILKWEED	ASCLEPIAS INCARNATA		N/A	SEED MIX	4/29 - 9/27	
SHOWY TICKSEED	BIDENS ARISTOSA		N/A	SEED MIX	4/29 - 9/27	
SNEEZEWEED	HELENIUM AUTUMNALE		N/A	SEED MIX	4/29 - 9/27	
YELLOW WINGSTEM	VERBESINA ALTERNIFOLIA		N/A	SEED MIX	4/29 - 9/27	
NEW YORK IRONWE	VERNONIA NOVEBORACENSIS		N/A	SEED MIX	4/29 - 9/27	
NEW ENGLAND AST	ASTER NOVAE-ANGLIAE		N/A	SEED MIX	4/29 - 9/27	
WOODED AREA						1.11 ACRES
RIVER BIRCH	BETULA NIGRA	40	6' WHIP	BARE ROOT	4/29 - 9/27	
AMERICAN SYCAM	PLATANUS OCCIDENTALIS	38	6' WHIP	BARE ROOT	4/29 - 9/27	
SWAMP WHITE OAK	QUERCUS BICOLOR	42	6' WHIP	BARE ROOT	4/29 - 9/27	
PIN OAK	QUERCUS PALUSTRIS	41	6' WHIP	BARE ROOT	4/29 - 9/27	
BLACK WILLOW	SALIX NIGRA	39	6' WHIP	BARE ROOT	4/29 - 9/27	
RED MAPLE	ACER RUBRUM	38	6' WHIP	BARE ROOT	4/29 - 9/27	
STAGHORN SUMAC	RHUS TYPHINA	41	12"	BARE ROOT	4/29 - 9/27	
BLACK-HAW	VIBURNUM PRUNIFOLIUM	38	12"	BARE ROOT	4/29 - 9/27	
PANICLED DOGWOO	CORNUS RACEMOSA	42	12"	BARE ROOT	4/29 - 9/27	
BLACK CHOKEBER	ARONIA MELANOCARPA	39	12"	BARE ROOT	4/29 - 9/27	
COMMON ELDERBER	SAMBUCUS CANADENSIS	41	12"	BARE ROOT	4/29 - 9/27	
BUTTONBUSH	CEPHALANTHUS OCCIDENTALIS	39	12"	BARE ROOT	4/29 - 9/27	

No.	REVISIONS	DATE	BY	APR DATE	APR BY

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
7965 NORTH HIGH STREET, SUITE 200
COLUMBUS, OH 43235
PHONE: 614-472-8546
WWW.KIMLEY-HORN.COM

SCALE: 1" = 30'
DESIGNED BY: KAP
DRAWN BY: KAP
CHECKED BY: CMH

WETLAND PLANTING NOTES

STREAM CORRIDOR PROTECTION ZONE
REFORESTATION PLANS
BUCKEYE YARD
CITY OF COLUMBUS, FRANKLIN COUNTY, OH

ORIGINAL ISSUE: 10/17/2022
KHA PROJECT NO. 190118000
SHEET NUMBER
EC7.1

Drawing name: K:\CLB_LDEV\190118000_Xebec_Buckeye Yard_Columbus_OH\2 Design\CAD\PlanSheets\9_StreamReforestation\WETLAND PLANTING PLAN.dwg EC7.1 WETLAND PLANTING NOTES Oct 17, 2022 5:50pm by: bill.skebba
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Appendix G: Atlas Maps Stream Drainage Data

0.21 square miles

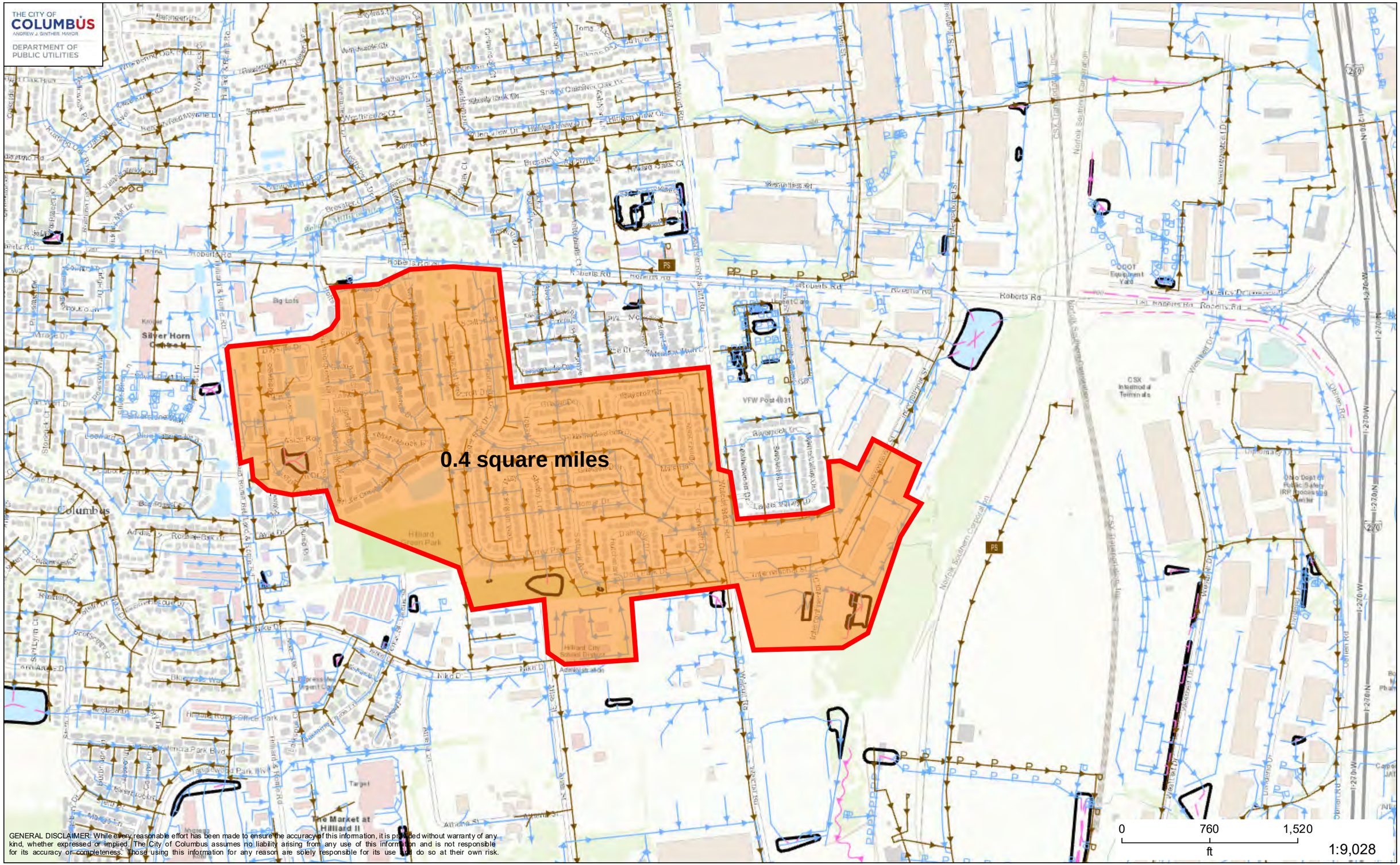
Stream 9 -
part 1

0.36 square miles

Stream 9 -
part 2

City of Columbus Department of Public Utilities

5/27/2022



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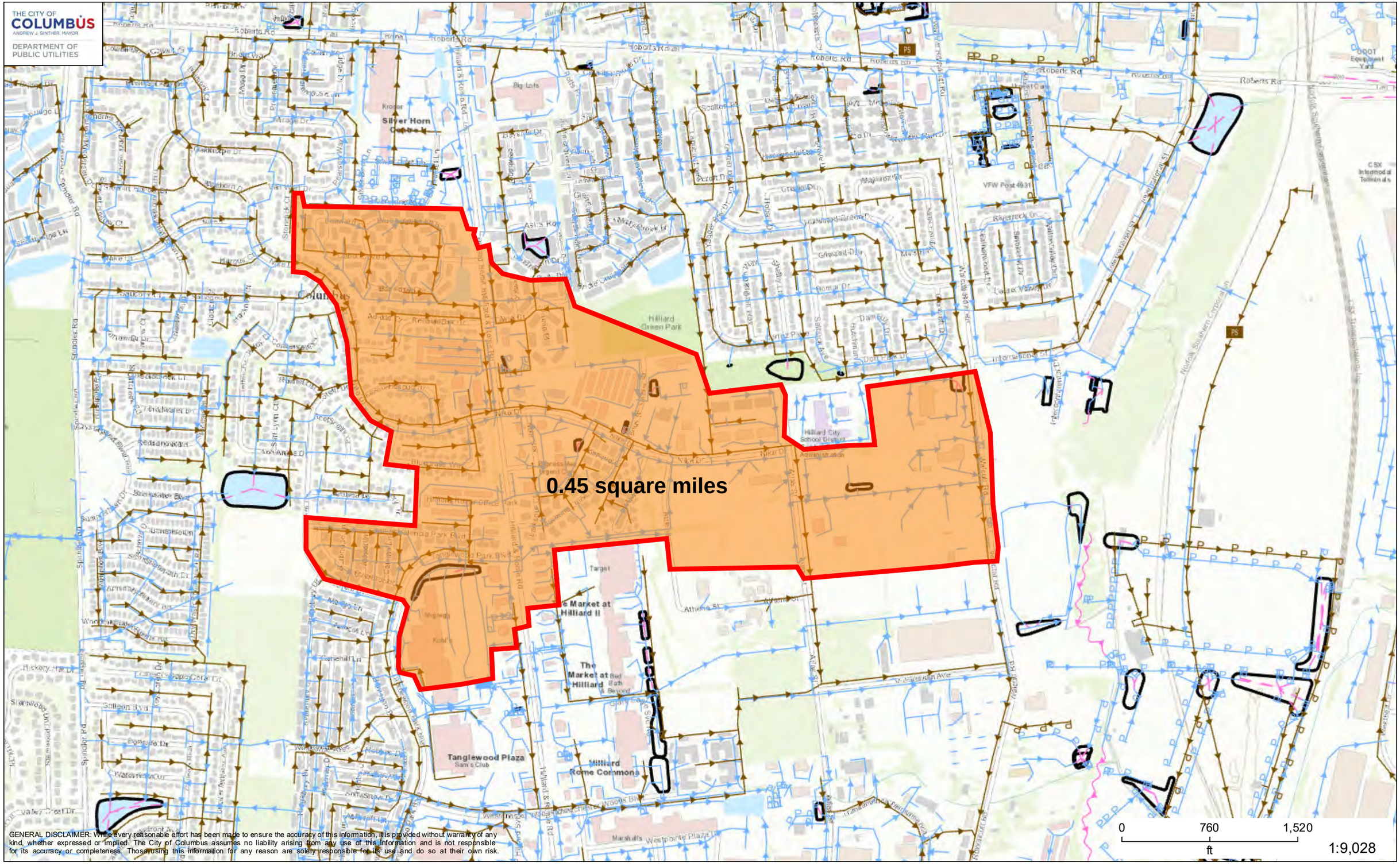
City of Columbus Department of Public Utilities

5/27/2022



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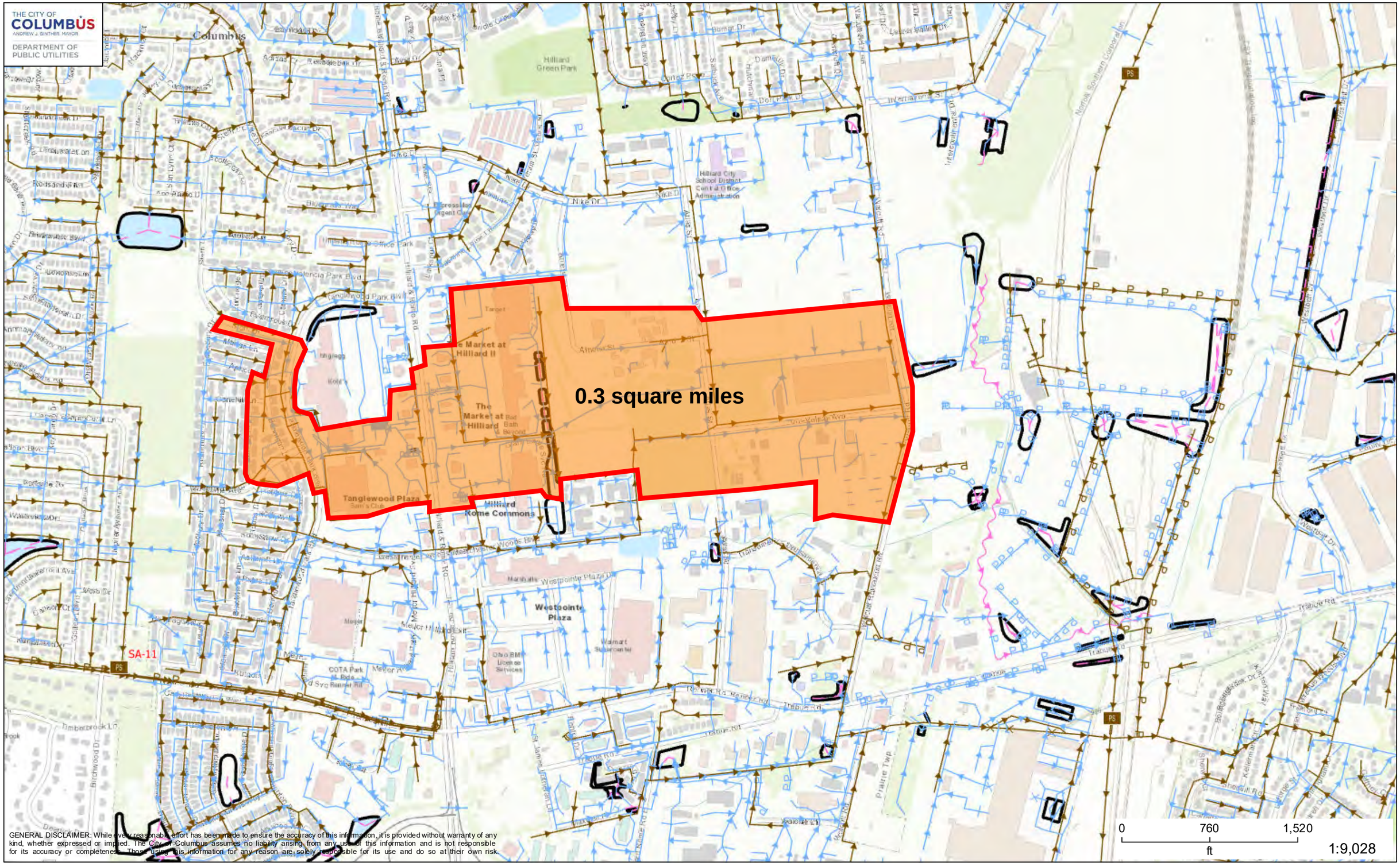
City of Columbus Department of Public Utilities

5/27/2022



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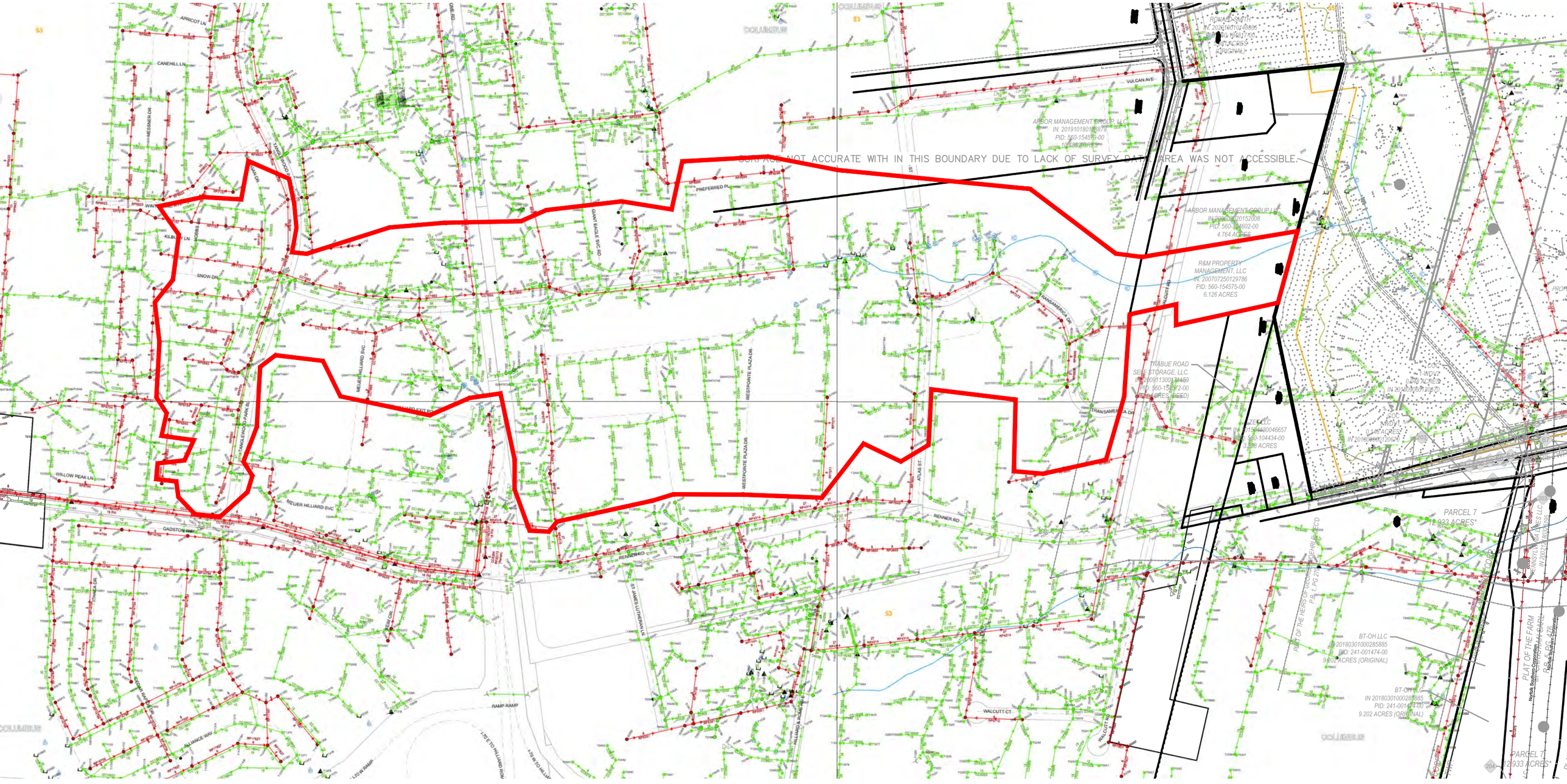
STREAM 13 TRIBUTARY AREA = 0.24 SQ. MI.



Appendix H: Stream Habitat Assessment Datasheets (HHEI and QHEI) and Photolog

Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 60

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 9 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.64

LENGTH OF STREAM REACH (ft) 200 LAT 40.002435 LONG -83.128997 RIVER MILE 0.00

DATE 08/30/2021 SCORER J. Williams COMMENTS Modified/created channel to outlet adjacent storm water pond

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE			PERCENT	TYPE			PERCENT
☐	☐	BLDR SLABS **[16 pts]**		☒	☐	SILT **[3 pt]**	30
☐	☐	BOULDER (>256 mm) **[16 pts]**		☐	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	20
☐	☐	BEDROCK **[16 pts]**		☐	☒	FINE DETRITUS **[3 pts]**	30
☐	☐	COBBLE (65-256 mm) **[12 pts]**		☐	☐	CLAY or HARDPAN **[0 pt]**	20
☐	☐	GRAVEL (2-64 mm) **[9 pts]**		☐	☐	MUCK **[0 pts]**	
☐	☐	SAND (<2 mm) **[6 pts]**		☐	☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 **(A)** 6 **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:**

(B) 4 **TOTAL NUMBER OF SUBSTRATE TYPES:**

HHEI Metric Points

Substrate Max = 40

10

A + B

2. Maximum Pool Depth (***Measure the maximum pool depth within the 61 meter (200 feet)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐	> 30 centimeters **[20 pts]**	☐	5 cm - 10 cm **[15 pts]**
☒	> 22.5 - 30 cm **[30 pts]**	☐	< 5 cm **[5pts]**
☐	> 10 - 22.5 cm **[25 pts]**	☐	NO WATER OR MOIST CHANNEL **[0pts]**

COMMENTS None **MAXIMUM POOL DEPTH (centimeters):** 28

Pool Depth Max = 30

30

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

☐	> 4.0 meters (> 13') **[30 pts]**	☐	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**	☐	≤ 1.0 m (≤ 3' 3") **[5 pts]**
☒	> 1.5 m - 3.0 m (> 4' 8" - 9' 7") **[20 pts]**		

COMMENTS None **AVERAGE BANKFULL WIDTH (meters)** 2.6

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ★ NOTE: River Left (L) and Right (R) as looking downstream ★

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☒	Stream Flowing	☐	Moist Channel, isolated pools, no flow (intermittent)
☐	Subsurface flow with isolated pools (interstitial)	☐	Dry channel, no water (ephemeral)

COMMENTS Possible elevated stream flow from recent precipitation event

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None	☐ 1.0	☒ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 8/28/2021 Quantity: 3.71 in

Photo-documentation Notes: Refer to attached photolog(s)

Elevated Turbidity? (Y/N): No Canopy (% open): No

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: _____

Additional comments/description of pollution impacts: Heavy trash in stream channel, which is assumed to be from roadside and upstream retention pond. Also, extremely heavy asian clam dominance in channel and substrate.

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

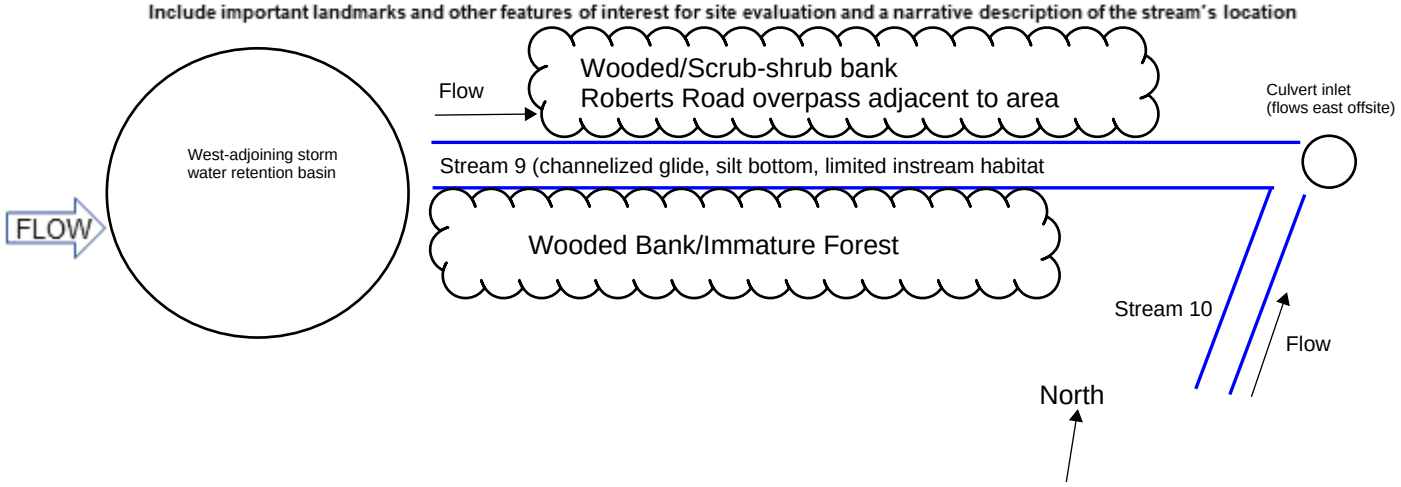
Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) Yes Species observed (if known): Asian clams, extensive

Comments Regarding Biology: Heavy silt and potential water quality issues from upstream retention pond, allowing for Asian clam population dominance

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 60

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 10 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.18

LENGTH OF STREAM REACH (ft) 200 LAT 39.999011 LONG -83.129813 RIVER MILE N/A

DATE 08/30/2021 SCORER J. Williams COMMENTS Modified/created channel to outlet adjacent storm water pond

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE			PERCENT	TYPE			PERCENT
☐	☐	BLDR SLABS **[16 pts]**		☒	☐	SILT **[3 pt]**	30
☐	☐	BOULDER (>256 mm) **[16 pts]**		☐	☒	LEAF PACK/WOODY DEBRIS **[3 pts]**	40
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	
☐	☐	COBBLE (65-256 mm) **[12 pts]**		☐	☐	CLAY or HARDPAN **[0 pt]**	
☐	☐	GRAVEL (2-64 mm) **[9 pts]**		☐	☐	MUCK **[0 pts]**	30
☐	☐	SAND (<2 mm) **[6 pts]**		☐	☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 **(A)**

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6 **(B) TOTAL NUMBER OF SUBSTRATE TYPES:** 3

HHEI Metric Points

Substrate Max = 40

9

A + B

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 feet)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐	> 30 centimeters **[20 pts]**	☐	5 cm - 10 cm **[15 pts]**
☒	> 22.5 - 30 cm **[30 pts]**	☐	< 5 cm **[5pts]**
☐	> 10 - 22.5 cm **[25 pts]**	☐	NO WATER OR MOIST CHANNEL **[0pts]**

COMMENTS None **MAXIMUM POOL DEPTH (centimeters):** 28

Pool Depth Max = 30

30

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

☐	> 4.0 meters (> 13') **[30 pts]**	☐	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**	☐	≤ 1.0 m (≤ 3' 3") **[5 pts]**
☒	> 1.5 m - 3.0 m (> 4' 8" - 9' 7") **[20 pts]**		

COMMENTS None **AVERAGE BANKFULL WIDTH (meters)** 2.4

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ★ NOTE: River Left (L) and Right (R) as looking downstream ★

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☐	Immature Forest, Shrub or Old Field	☐	☒	Urban or Industrial
☐	☒	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☒	Stream Flowing	☐	Moist Channel, isolated pools, no flow (intermittent)
☐	Subsurface flow with isolated pools (interstitial)	☐	Dry channel, no water (ephemeral)

COMMENTS Possible elevated stream flow from recent precipitation event

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐	None	☒	1.0	☐	2.0	☐	3.0
☐	0.5	☐	1.5	☐	2.5	☐	>3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☒ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 8/28/2021 Quantity: 3.71 in

Photo-documentation Notes: Refer to attached photolog(s)

Elevated Turbidity?(Y/N): No Canopy (% open): No

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: None

Additional comments/description of pollution impacts: None

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

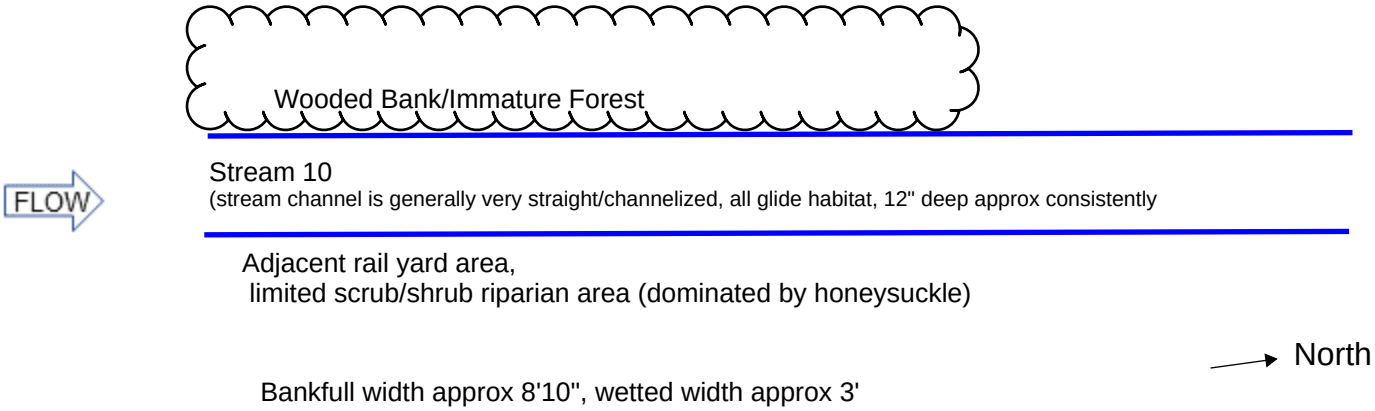
Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) No Species observed (if known): N/A

Comments Regarding Biology: None

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 32.5

Stream & Location: Stream 11 - Proposed Buckeye Yard Redevelopment **RM:** 5.1 **Date:** 08/ 30 / 21

Scorers Full Name & Affiliation: Justin S. Williams, Environmental Scientist Kimley-Horn

River Code: 05060001-12-05 **STORET #:** N/A **Lat./ Long.:** 39.993314, -83.134676 (NAD 83 - decimal °) **Office verified location** ☒

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]	20	
☐☐ COBBLE [8]			☐☒ MUCK [2]	25	
☐☐ GRAVEL [7]			☒☐ SILT [2]	55	
☐☐ SAND [6]			☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☐ LIMESTONE [1]	☒ HEAVY [-2]
☒ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☒ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☐ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Substrate 1 (Maximum 20)

Comments
Stream extremely channelized, limited substrate

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0	UNDERCUT BANKS [1]	2	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]
2	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]
0	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	1	LOGS OR WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT
Check ONE (Or 2 & average)
☐ EXTENSIVE >75% [11]
☒ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments
None

Cover 11 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☒ LOW [2]	☐ FAIR [3]	☒ RECOVERING [3]	☒ LOW [1]
☒ NONE [1]	☒ POOR [1]	☒ RECENT OR NO RECOVERY [1]	

Comments
None

Channel 5.5 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☒☒ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☒☒ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☒☒ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments
None

Riparian 3 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!))
☐ > 1m [6]
☐ 0.7-<1m [4]
☒ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average))
☐ POOL WIDTH > RIFFLE WIDTH [2]
☒ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)
☐ TORRENTIAL [-1] ☒ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ FAST [1] ☐ INTERMITTENT [-2]
☐ MODERATE [1] ☐ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments Aveage depth was 26" to 37" throughout, wetted width was 14'9"

Pool / Current 4 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☒ BEST AREAS < 5cm [metric=0]		☒ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☒ EXTENSIVE [-1]

Comments Entire channel was one deep glide. Highly channelized, very poor/limited channel habitat

Riffle / Run 0 (Maximum 8)

6] GRADIENT

(30.6 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (1.07 mi²)

%POOL: 0 %GLIDE: 100
%RUN: 0 %RIFFLE: 0

Gradient 8 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass- 2nd

- [ ] HIGH [ ]
- [x] UP [ ]
- [ ] NORMAL [ ]
- [ ] LOW [ ]
- [ ] DRY [ ]

DISTANCE

- [ ] 0.5 Km
- [x] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CLARITY

1st --sample pass-- 2nd

- [x] < 20 cm [ ]
- [ ] 20-<40 cm [ ]
- [ ] 40-70 cm [ ]
- [ ] > 70 cm/ CTB [ ]
- [ ] SECCHI DEPTH [ ]

CANOPY

- [ ] > 85%- OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [x] 10%-<30%
- [ ] <10%- CLOSED

pass 1st_____ cm
2nd_____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Yes, stream channelize extremely channelized. Poor/very limited steam habitat characteristis and flow. Entire stream is one long glide with no flow changes or habitat variation to influence flow change. It is assumed the stream was historically modified and channelized due to the historic railroad yard construction and prior agricultural development.

B] AESTHETICS

- [ ] NUISANCE ALGAE
- [ ] INVASIVE MACROPHYTES
- [ ] EXCESS TURBIDITY
- [ ] DISCOLORATION
- [ ] FOAM / SCUM
- [ ] OIL SHEEN
- [ ] TRASH / LITTER
- [ ] NUISANCE ODOR
- [ ] SLUDGE DEPOSITS
- [ ] CSOs/SSOs/OUTFALLS

C] RECREATION

POOL: AREA [ ] >100ft² DEPTH [ ] >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

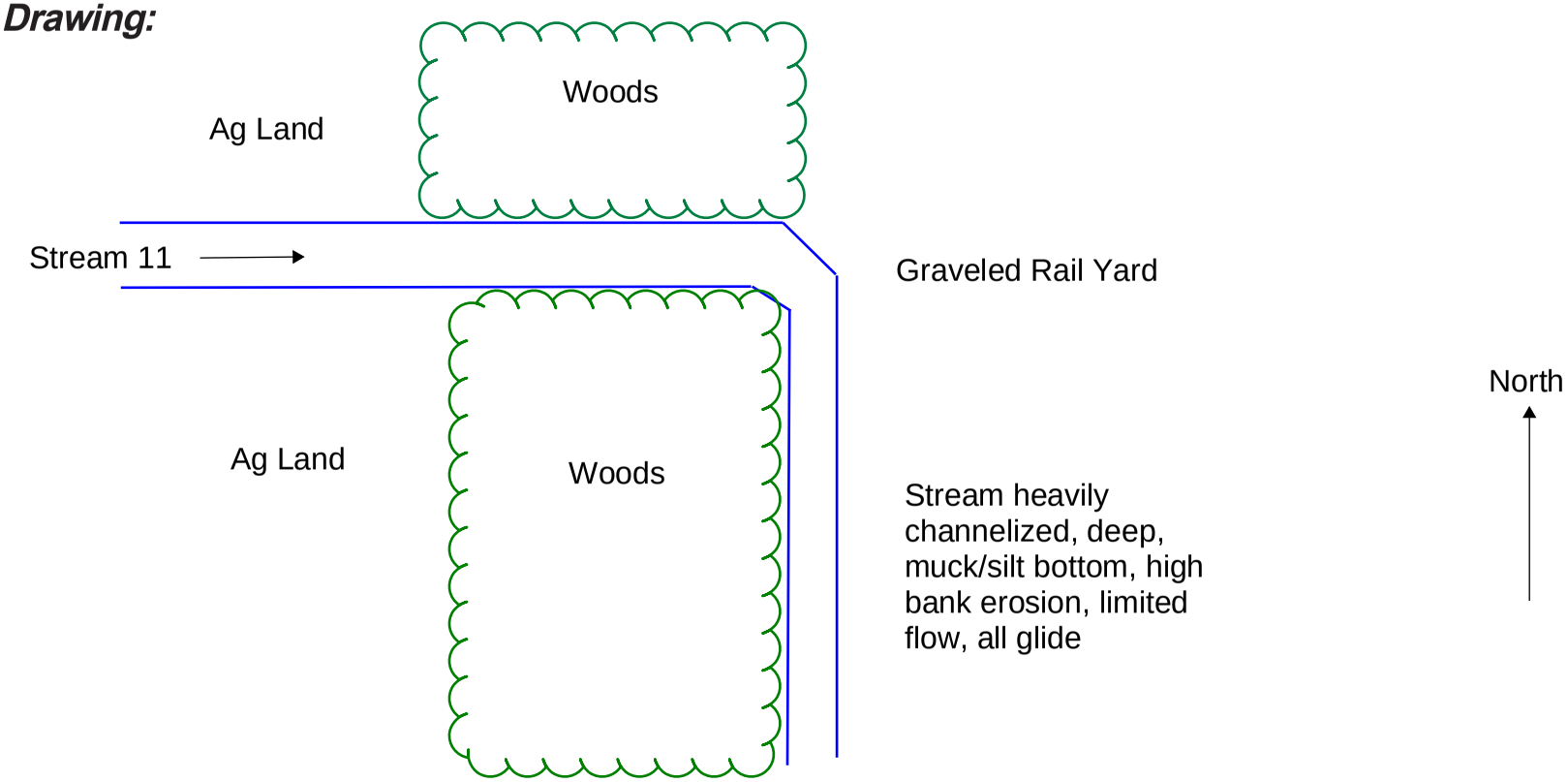
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 32.5

Stream & Location: Stream 12 - Proposed Buckeye Yard Redevelopment **RM:** 5.1 **Date:** 08/ 30 / 21

Justin S. Williams, Environmental Scientist **Scorers Full Name & Affiliation:** Kimley-Horn

River Code: 05060001-12-05 **STORET #:** N/A **Lat./ Long.:** (NAD 83 - decimal °) 39 .990095 /83 .134275 **Office verified location** ☒

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]	20	
☐ ☐ COBBLE [8]			☐ ☒ MUCK [2]	25	
☐ ☐ GRAVEL [7]			☒ ☐ SILT [2]	55	
☐ ☐ SAND [6]			☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☐ LIMESTONE [1]	☒ HEAVY [-2]
☒ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☒ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☐ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Substrate 1 (Maximum 20)

Comments Stream extremely channelized, limited substrate

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0	UNDERCUT BANKS [1]	2	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]
2	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]
0	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	1	LOGS OR WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT

Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11]
☒ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Cover 11 (Maximum 20)

Comments None

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☒ LOW [2]	☐ FAIR [3]	☒ RECOVERING [3]	☒ LOW [1]
☒ NONE [1]	☒ POOR [1]	☒ RECENT OR NO RECOVERY [1]	

Channel 5.5 (Maximum 20)

Comments None

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☒ ☒ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☒ ☒ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☒ ☒ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Riparian 3 (Maximum 10)

Comments None

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!))	CHANNEL WIDTH (Check ONE (Or 2 & average))	CURRENT VELOCITY (Check ALL that apply)	
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1]	☒ SLOW [1]
☐ 0.7-<1m [4]	☒ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☒ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1]	☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☐ MODERATE [1]	☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.	

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current 4 (Maximum 12)

Comments Aveage depth was 26" to 37" throughout, wetted width was 14'9"

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☒ BEST AREAS < 5cm [metric=0]		☒ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☒ EXTENSIVE [-1]

Riffle / Run 0 (Maximum 8)

Comments Entire channel was one deep glide. Highly channelized, very poor/limited channel habitat

6] GRADIENT

(32.2 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.73 mi²)

%POOL: 0 %GLIDE: 100
%RUN: 0 %RIFFLE: 0

Gradient 8 (Maximum 10)

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass- 2nd

- [ ] HIGH [ ]
- [x] UP [ ]
- [ ] NORMAL [ ]
- [ ] LOW [ ]
- [ ] DRY [ ]

DISTANCE

- [ ] 0.5 Km
- [x] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CLARITY

1st --sample pass-- 2nd

- [x] < 20 cm [ ]
- [ ] 20-<40 cm [ ]
- [ ] 40-70 cm [ ]
- [ ] > 70 cm/ CTB [ ]
- [ ] SECCHI DEPTH [ ]

CANOPY

- [ ] > 85%- OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [x] 10%-<30%
- [ ] <10%- CLOSED

pass 1st_____ cm 2nd_____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Yes, stream channelize extremely channelized. Poor/very limited steam habitat characteristis and flow. Entire stream is one long glide with no flow changes or habitat variation to influence flow change. It is assumed the stream was historically modified and channelized due to the historic railroad yard construction and prior agricultural development.

B] AESTHETICS

- [ ] NUISANCE ALGAE
- [ ] INVASIVE MACROPHYTES
- [ ] EXCESS TURBIDITY
- [ ] DISCOLORATION
- [ ] FOAM / SCUM
- [ ] OIL SHEEN
- [ ] TRASH / LITTER
- [ ] NUISANCE ODOR
- [ ] SLUDGE DEPOSITS
- [ ] CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: [ ] >100ft² [ ] >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

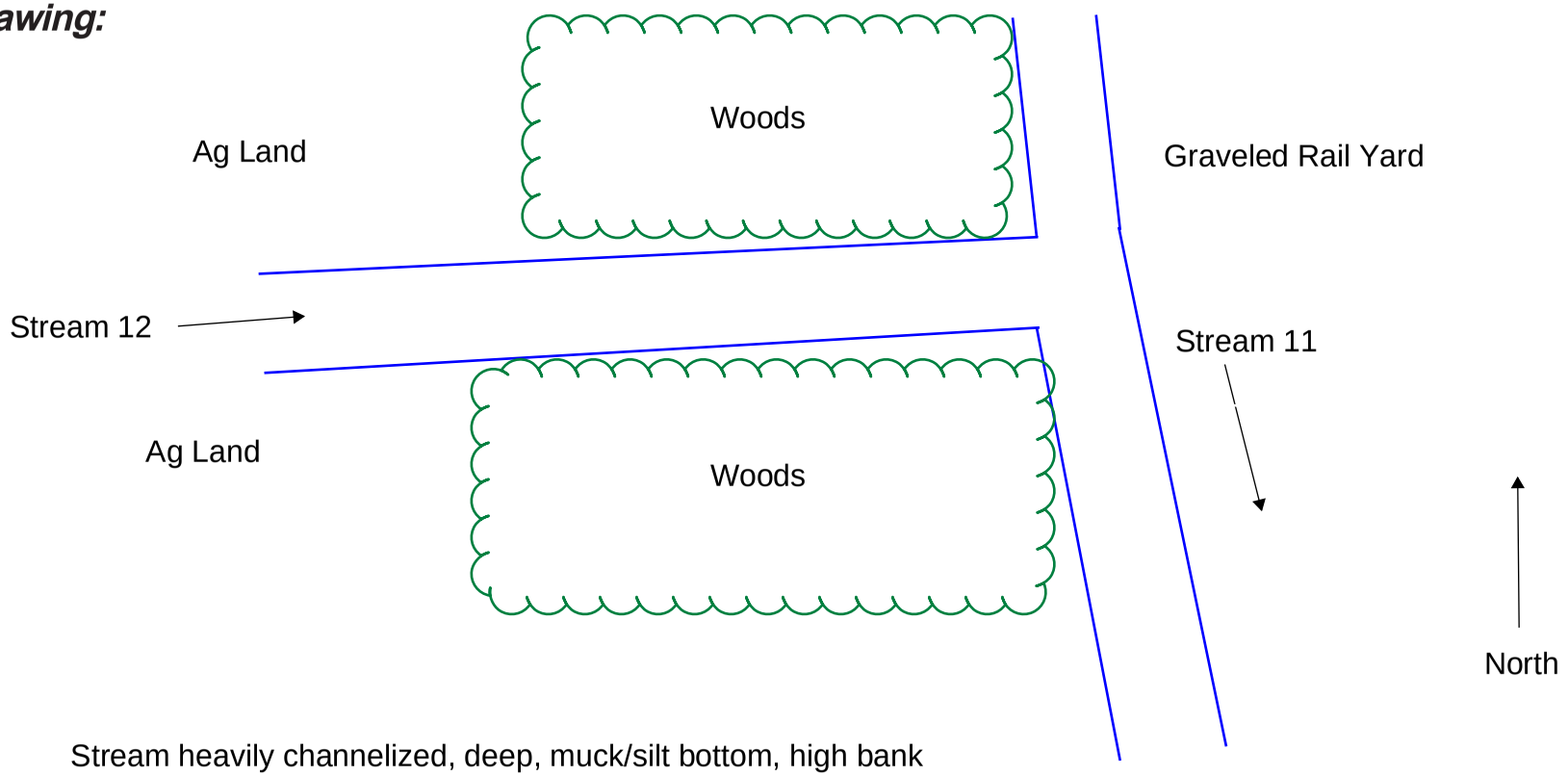
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Stream heavily channelized, deep, muck/silt bottom, high bank erosion, limited flow, all glide

Photo 1: Representative view of forested Wetland 7 facing east. Photo taken April 9-13, 2021.

Photo 2: Representative view of forested Wetland 7 facing south. Photo taken April 9-13, 2021.

Photo 3: Representative view of forested Wetland 7 facing north. Photo taken February 10, 2022.

Photo 4: Representative view of forested Wetland 7 facing east. Photo taken February 10, 2022.

Photo 5: Representative view of forested Wetland 7 facing south. Photo taken February 10, 2022.

Photo 6: Representative view of forested Wetland 7 facing west. Photo taken February 10, 2022.

Photo 7: Representative view of emergent Wetland 8 facing east. Photo taken April 9-13, 2021.

Photo 8: Representative view of emergent Wetland 8 facing south. Photo taken April 9-13, 2021.

Photo 9: Representative view of emergent Wetland 8 facing north. Photo taken February 10, 2022.

Photo 10: Representative view of emergent Wetland 8 facing east. Photo taken February 10, 2022.

Photo 11: Representative view of emergent Wetland 8 facing south. Photo taken February 10, 2022.

Photo 12: Representative view of emergent Wetland 8 facing west. Photo taken February 10, 2022.

Photo 13: Representative view of Pond 1 facing northeast. Photo taken April 9-12, 2021.

Photo 14: Representative view of Pond 1 facing southwest. Photo taken April 9-12, 2021.

Photo 15: Representative view of Pond 1 facing west. Photo taken February 10, 2022.

Photo 16: Representative view of Pond 1 facing east. Photo taken February 10, 2022.

Photo 17: Representative view of the western portion of Stream 9 facing east (downstream). Photo taken April 9-12, 2021.

Photo 18: Representative view of western portion of Stream 9 facing west (upstream) toward western stormwater basin. Photo taken April 9-12, 2021.

Photo 19: Representative view of the northwest stormwater basin that flows into Stream 9, located just west of the Site. Photo taken April 9-12, 2021.

Photo 20: Representative view of Stream 9 channel bottom. Photo taken August 30, 2021.

Photo 21: Representative view of Stream 9 channel bottom substrate (silt/detritus and Asian fingernail clams). Photo taken August 30, 2021.

Photo 22: Representative view of Stream 9 channel bottom substrate (silt/detritus and Asian fingernail clams). Photo taken August 30, 2021.

Photo 23: Representative view of Stream 9 facing upstream (west). Photo taken August 30, 2021.

Photo 24: Representative view of Stream 9 facing downstream (east). Photo taken August 30, 2021.

Photo 25: Representative view of Stream 10 facing upstream (south). Photo taken April 9-12, 2021.

Photo 26: Representative view of Stream 10 facing downstream (north) photo taken April 9-12, 2021.

Photo 27: Representative view of Stream 10 facing upstream (south). Photo taken August 30, 2021.

Photo 28: Representative view of Stream 10 facing downstream (north). Photo taken August 30, 2021.

Photo 29: Representative view of Stream 10 channel bottom substrate.

Photo 30: Representative view of Stream 10 channel bottom substrate.

Photo 31: Representative view of Stream 11 facing upstream (west) towards the west adjoining property. Photo taken April 9-12, 2021.

Photo 32: Representative view of Stream 11 facing downstream (east) as it flows onto the Site. Photo taken April 9-12, 2021.

Photo 33: Representative view of the central portion of Stream 11 facing upstream (west), Photo taken August 30, 2021.

Photo 34: Representative view of the central portion of Stream 11 facing western stream bank. Channel is extremely deep in this location; bottom substrate is unconsolidated muck/silt with no flow. Photo taken August 30, 2021.

Photo 35: Representative view of the central portion of Stream 11 facing western stream bank. Channel is extremely deep in this location; bottom substrate is unconsolidated muck/silt with no flow. Photo taken August 30, 2021.

Photo 36: View of the northern portion of Stream 11 (just north of Stream 12) facing upstream (north). Photo taken February 10, 2022.

Photo 36: Representative view of the southwest portion of Stream 11 (southeast of access road crossing) facing downstream (south). Photo taken February 10, 2022.

Photo 37: Representative view of southwest portion of Stream 11 channel bottom substrate (southeast of access road crossing). Photo taken February 10, 2022.

Photo 38: Representative view of Stream 12 facing west (upstream), just west of confluence with Stream 11. Photo taken August 30, 2021.

Photo 39: Representative view of Stream 12 facing east (downstream), just west of confluence with Stream 11. Photo taken August 30, 2021.

Photo 40: Representative view of the central portion of Stream 12 facing north stream bank. Channel is extremely deep in this location; bottom substrate is unconsolidated muck/silt with no flow. Photo taken August 30, 2021.

Photo 41: Representative view of the central portion of Stream 12 facing north stream bank. Channel is extremely deep in this location; bottom substrate is unconsolidated muck/silt with no flow. Photo taken August 30, 2021.

Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 64

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 13 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.15

LENGTH OF STREAM REACH (ft) 200 LAT 39.986617 LONG -83.133978 RIVER MILE N/A

DATE 5/24/22 SCORER J. Williams COMMENTS Modified channel to outlet adjacent storm water pond

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE		PERCENT	TYPE		PERCENT
☐ ☐	BLDR SLABS [16 pts]		☒ ☐	SILT [3 pt]	20
☐ ☐	BOULDER (>256 mm) [16 pts]		☐ ☒	LEAF PACK/WOODY DEBRIS [3 pts]	
☐ ☐	BEDROCK [16 pts]		☐ ☐	FINE DETRITUS [3 pts]	
☐ ☐	COBBLE (65-256 mm) [12 pts]	50	☐ ☐	CLAY or HARDPAN [0 pt]	
☐ ☐	GRAVEL (2-64 mm) [9 pts]	30	☐ ☐	MUCK [0 pts]	
☐ ☐	SAND (<2 mm) [6 pts]		☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 50 (A)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 21

(B) TOTAL NUMBER OF SUBSTRATE TYPES: 3

HHEI Metric Points

Substrate Max = 40: 24

A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61 meter (200 feet)* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☒ 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5pts]
- ☐ NO WATER OR MOIST CHANNEL [0pts]

COMMENTS None MAXIMUM POOL DEPTH (centimeters): 8.5

Pool Depth Max = 30: 15

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

- ☐ > 4.0 meters (> 13') [30 pts]
- ☒ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS None AVERAGE BANKFULL WIDTH (meters): 3.9

Bankfull Width Max=30: 25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream *

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☒	☒	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- ☒ Stream Flowing
- ☐ Subsurface flow with isolated pools (interstitial)
- ☐ Moist Channel, isolated pools, no flow (intermittent)
- ☐ Dry channel, no water (ephemeral)

COMMENTS Stream appears to be likely intermittent (originates at SW basin to the west)

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None	☒ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (<0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 5/22/2021 Quantity: 0.13 in

Photo-documentation Notes: Refer to attached photolog(s)

Elevated Turbidity?(Y/N): No Canopy (% open): 30

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: None

Additional comments/description of pollution impacts: None

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) No Species observed (if known): N/A

Comments Regarding Biology: None

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

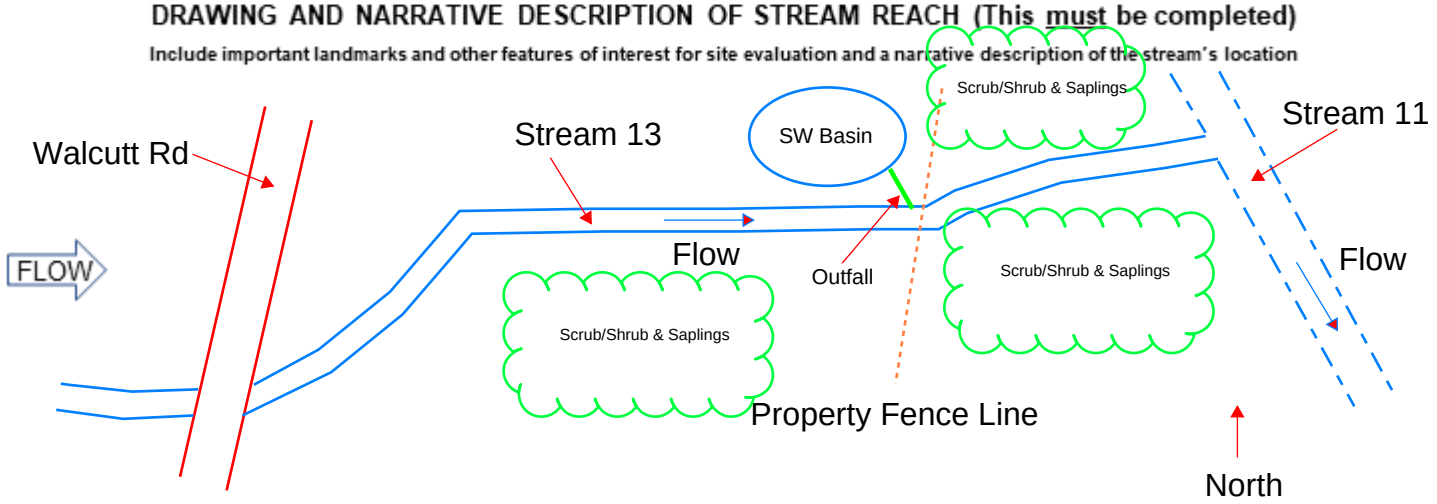


Photo 1: View of the Stream 13 corridor (shrub area) facing north. Photo taken just southwest of where Stream 13 flows east into Stream 11 (near yellow pipeline markers).

Photo 3: View of the cross section of the Stream 13 channel facing north, located just west (upstream) of the confluence with Stream 11.

Photo 2: View of the confluence of Stream 13 (left side) as it flows east (downstream) into Stream 11. Stream 11 is impounded at this located due to beaver dams.

Photo 4: View of the central portion of Stream 11 facing upstream (west).

Photo 5: View of the central portion of Stream 11 facing downstream (east).

Photo 7: View of the western (upstream) offsite portion of Stream 13 located just west (upstream) of the Site boundary facing west (upstream).

Photo 6: View of the western (upstream) Site boundary (fencing) located just east of a storm water outflow pipe (just offsite). Photo taken facing west (upstream).

Appendix I: Pebble Count Datasheets

Pebble Count Data Sheet

Stream 9 - 320 LF Total

Size categories	Size ranges (mm)	Tallies (counts)
Silt/clay	< 0.06	**100 (all silt)**
Very fine sand	0.06 – 0.125	
Fine sand	0.126 – 0.25	
Medium sand	0.26 – 0.5	
Coarse sand	0.5 – 1	
Very coarse sand	1 - 2	
Very fine gravel	2 - 4	
Fine gravel	5 - 8	
Medium gravel	9 - 16	
Coarse gravel	17 - 32	
Very coarse gravel	33 - 64	
Small cobble	65 - 90	
Medium cobble	91 - 128	
Large cobble	129 - 180	
Very large cobble	181 - 255	
Small boulder	256 - 512	
Medium boulder	513 - 1024	
Large boulder	1025 – 2048	
Very large boulder	> 2048	
Bedrock	Large unbroken rock surface	
Woody debris	Leaves, sticks etc.	
	Total count	**100**

Stations

1	**A - 32 lf**
2	**B - 64 lf**
3	**C - 76 lf**
4	**D - 128 lf**
5	**E - 160 lf**
6	**F - 192 lf**
7	**G - 224 lf**
8	**H - 256 lf**
9	**I - 288 lf**
10	**J - 320 lf**

Enter the tape positions

Indicate the method used below

	Zigzag
	% Habitat
X	Transects/Stations (**Enter your tape position**)

% Channel features (Estimate)

Riffles	Runs	Pools
5	**85 (all glide)**	**10**

Note: This data sheet incorporates both basic and advanced pebble count classification. Basic categories include silt, sand, fine and coarse gravel, cobble, boulder and bedrock. Pebble counts can be part of SOS levels 1-3 and should be performed at least once per year during low-water conditions. A version of the pebble count is included on all SOS biosurvey forms.

***Total stream length was divided up into approximately 10 sampling stations evenly located throughout the onsite stream portion. Sampling was conducted at each station (or within proximity), divided across the stream channel and ensuring that all representative habitat types were adequatedly sampled and accounted for.**

Pebble Count Data Sheet

Stream 10 - 2,552 LF Total

Size categories	Size ranges (mm)	Tallies (counts)	Stations
Silt/clay	< 0.06	**76 (all silt)**	1 **A - 255.2 lf**
Very fine sand	0.06 – 0.125		
Fine sand	0.126 – 0.25	**3**	2 **B - 510.4 lf**
Medium sand	0.26 – 0.5		
Coarse sand	0.5 – 1	**5**	3 **C - 765.6 lf**
Very coarse sand	1 - 2	**12**	
Very fine gravel	2 - 4	**3**	4 **D - 1,020.8 lf**
Fine gravel	5 - 8		
Medium gravel	9 - 16	**1**	5 **E - 1,276.0 lf**
Coarse gravel	17 - 32		
Very coarse gravel	33 - 64		6 **F - 1,531.2 lf**
Small cobble	65 - 90		
Medium cobble	91 - 128		7 **G - 1,786.4 lf**
Large cobble	129 - 180		
Very large cobble	181 - 255		
Small boulder	256 - 512		8 **H - 2,041.6**
Medium boulder	513 - 1024		
Large boulder	1025 – 2048		9 **I - 2,296.8 lf**
Very large boulder	> 2048		
Bedrock	Large unbroken rock surface		10 **J - 2,552.0 lf**
Woody debris	Leaves, sticks etc.		**Enter the tape positions**
	Total count	**100**	

Indicate the method used below

	Zigzag
	% Habitat
X	Transects/Stations (**Enter your tape position**)

% Channel features (Estimate)

Riffles	Runs	Pools
10	**80 (all glide)**	**10**

Note: This data sheet incorporates both basic and advanced pebble count classification. Basic categories include silt, sand, fine and coarse gravel, cobble, boulder and bedrock. Pebble counts can be part of SOS levels 1-3 and should be performed at least once per year during low-water conditions. A version of the pebble count is included on all SOS biosurvey forms.

***Total stream length was divided up into approximately 10 sampling stations evenly located throughout the onsite stream portion. Sampling was conducted at each station (or within proximity), divided across the stream channel and ensuring that all representative habitat types were adequatedly sampled and accounted for.**

Pebble Count Data Sheet

Stream 11 - 3,921 LF Total

Size categories	Size ranges (mm)	Tallies (counts)
Silt/clay	< 0.06	**44**
Very fine sand	0.06 – 0.125	
Fine sand	0.126 – 0.25	
Medium sand	0.26 – 0.5	
Coarse sand	0.5 – 1	**3**
Very coarse sand	1 - 2	
Very fine gravel	2 - 4	**1**
Fine gravel	5 - 8	**9**
Medium gravel	9 - 16	**3**
Coarse gravel	17 - 32	**13**
Very coarse gravel	33 - 64	**3**
Small cobble	65 - 90	**12**
Medium cobble	91 - 128	**12**
Large cobble	129 - 180	
Very large cobble	181 - 255	
Small boulder	256 - 512	
Medium boulder	513 - 1024	
Large boulder	1025 – 2048	
Very large boulder	> 2048	
Bedrock	Large unbroken rock surface	
Woody debris	Leaves, sticks etc.	
	Total count	**100**

Stations

1 **A - 392.1 lf**

2 **B - 784.2 lf**

3 **C - 1,176.3 lf**

4 **D - 1,568.4 lf**

5 **E - 1,960.5 lf**

6 **F - 2,352.6 lf**

7 **G - 2,744.7 lf**

8 **H - 3,136.8 lf**

9 **I - 3,528.9 lf**

10 **J - 3,921.0 lf**

Enter the tape positions

Indicate the method used below

	Zigzag
	% Habitat
X	Transects/Stations (**Enter your tape position**)

% Channel features (Estimate)

Riffles	Runs	Pools
5	**90 (all glide)**	**5**

Note: This data sheet incorporates both basic and advanced pebble count classification. Basic categories include silt, sand, fine and coarse gravel, cobble, boulder and bedrock. Pebble counts can be part of SOS levels 1-3 and should be performed at least once per year during low-water conditions. A version of the pebble count is included on all SOS biosurvey forms.

***Total stream length was divided up into approximately 10 sampling stations evenly located throughout the onsite stream portion. Sampling was conducted at each station (or within proximity), divided across the stream channel and ensuring that all representative habitat types were adequatedly sampled and accounted for.**

Pebble Count Data Sheet

Stream 12 - 369 LF Total

Size categories	Size ranges (mm)	Tallies (counts)
Silt/clay	< 0.06	**100 (all silt)**
Very fine sand	0.06 – 0.125	
Fine sand	0.126 – 0.25	
Medium sand	0.26 – 0.5	
Coarse sand	0.5 – 1	
Very coarse sand	1 - 2	
Very fine gravel	2 - 4	
Fine gravel	5 - 8	
Medium gravel	9 - 16	
Coarse gravel	17 - 32	
Very coarse gravel	33 - 64	
Small cobble	65 - 90	
Medium cobble	91 - 128	
Large cobble	129 - 180	
Very large cobble	181 - 255	
Small boulder	256 - 512	
Medium boulder	513 - 1024	
Large boulder	1025 – 2048	
Very large boulder	> 2048	
Bedrock	Large unbroken rock surface	
Woody debris	Leaves, sticks etc.	

Stations

1 **A - 36.9 lf**

2 **B - 73.8 lf**

3 **C - 110.7 lf**

4 **D - 147.6**

5 **E - 184.5 lf**

6 **F - 221.4 lf**

7 **G - 258.3 lf**

8 **H - 295.2 lf**

9 **I - 332.1 lf**

10 **J - 369 lf**

Enter the tape positions

Total count **100**

Indicate the method used below

	Zigzag
	% Habitat
X	Transects/Stations (**Enter your tape position**)

% Channel features (Estimate)

Riffles	Runs	Pools
	100 (all glide)	

Note: This data sheet incorporates both basic and advanced pebble count classification. Basic categories include silt, sand, fine and coarse gravel, cobble, boulder and bedrock. Pebble counts can be part of SOS levels 1-3 and should be performed at least once per year during low-water conditions. A version of the pebble count is included on all SOS biosurvey forms.

***Total stream length was divided up into approximately 10 sampling stations evenly located throughout the onsite stream portion. Sampling was conducted at each station (or within proximity), divided across the stream channel and ensuring that all representative habitat types were adequatedly sampled and accounted for.**

Pebble Count Data Sheet

Stream 13 - 250.00 LF Total

Size categories	Size ranges (mm)	Tallies (counts)
Silt/clay	< 0.06	**10**
Very fine sand	0.06 – 0.125	
Fine sand	0.126 – 0.25	
Medium sand	0.26 – 0.5	**2**
Coarse sand	0.5 – 1	
Very coarse sand	1 - 2	**3**
Very fine gravel	2 - 4	**8**
Fine gravel	5 - 8	**9**
Medium gravel	9 - 16	**9**
Coarse gravel	17 - 32	**10**
Very coarse gravel	33 - 64	**9**
Small cobble	65 - 90	**13**
Medium cobble	91 - 128	**12**
Large cobble	129 - 180	**11**
Very large cobble	181 - 255	**3**
Small boulder	256 - 512	**1**
Medium boulder	513 - 1024	
Large boulder	1025 – 2048	
Very large boulder	> 2048	
Bedrock	Large unbroken rock surface	
Woody debris	Leaves, sticks etc.	

Stations
1 **A - 25.0 lf**
2 **B - 50.0 lf**
3 **C - 75.0 lf**
4 **D - 100.0 lf**
5 **E - 125.0 lf**
6 **F - 150.0 lf**
7 **G - 175.0 lf**
8 **H - 200.0 lf**
9 **I - 225.0 lf**
10 **J - 250.0 lf**

Enter the tape positions

Total count **100**

Indicate the method used below

	Zigzag
	% Habitat
X	Transects/Stations (**Enter your tape position**)

% Channel features (Estimate)

Riffles	Runs	Pools
10	**80 (40% glide)**	**10**

Note: This data sheet incorporates both basic and advanced pebble count classification. Basic categories include silt, sand, fine and coarse gravel, cobble, boulder and bedrock. Pebble counts can be part of SOS levels 1-3 and should be performed at least once per year during low-water conditions. A version of the pebble count is included on all SOS biosurvey forms.

***Total stream length was divided up into approximately 10 sampling stations evenly located throughout the onsite stream portion. Sampling was conducted at each station (or within proximity), divided across the stream channel and ensuring that all representative habitat types were adequatedly sampled and accounted for.**

Appendix J: Anticipated Stream Habitat Assessment Datasheets for Relocated Streams (HHEI and QHEI)

Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 76

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 9 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.64

LENGTH OF STREAM REACH (ft) 200 LAT 40.002435 LONG -83.128997 RIVER MILE 0.00

DATE _____ SCORER J. Williams COMMENTS Anticipated Stream Restoration Score

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE			PERCENT	TYPE			PERCENT
☐	☐	BLDR SLABS **[16 pts]**		☐	☐	SILT **[3 pt]**	10
☐	☐	BOULDER (>256 mm) **[16 pts]**		☐	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	5
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	10
☐	☐	COBBLE (65-256 mm) **[12 pts]**	15	☐	☐	CLAY or HARDPAN **[0 pt]**	
☒	☐	GRAVEL (2-64 mm) **[9 pts]**	30	☐	☐	MUCK **[0 pts]**	
☐	☒	SAND (<2 mm) **[6 pts]**	30	☐	☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 15 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 6

HHEI Metric Points

Substrate Max = 40

21

A + B

2. Maximum Pool Depth (***Measure the maximum pool depth within the 61 meter (200 feet)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐	> 30 centimeters **[20 pts]**	☐	5 cm - 10 cm **[15 pts]**
☒	> 22.5 - 30 cm **[30 pts]**	☐	< 5 cm **[5pts]**
☐	> 10 - 22.5 cm **[25 pts]**	☐	NO WATER OR MOIST CHANNEL **[0pts]**

COMMENTS None **MAXIMUM POOL DEPTH (centimeters):** 25

Pool Depth Max = 30

30

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

☐	> 4.0 meters (> 13') **[30 pts]**	☐	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☒	> 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**	☐	≤ 1.0 m (≤ 3' 3") **[5 pts]**
☐	> 1.5 m - 3.0 m (> 4' 8" - 9' 7") **[20 pts]**		

COMMENTS None **AVERAGE BANKFULL WIDTH (meters)** 3.5

Bankfull Width Max=30

25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream *

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS None

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☒ Stream Flowing ☐ Moist Channel, isolated pools, no flow (intermittent)

☐ Subsurface flow with isolated pools (interstitial) ☐ Dry channel, no water (ephemeral)

COMMENTS None

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None	☐ 1.0	☐ 2.0	☒ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (<0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: N/A Quantity: N/A

Photo-documentation Notes: N/A

Elevated Turbidity? (Y/N): No Canopy (% open): 0

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: Newly relocated/restored stream channel

Additional comments/description of pollution impacts: N/A

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) No Species observed (if known): N/A

Comments Regarding Biology: None

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Please refer to the provided stream relocation/restoration plans

Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 75

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 10 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.18

LENGTH OF STREAM REACH (ft) 200 LAT 39.999011 LONG -83.129813 RIVER MILE N/A

DATE 08/30/2021 SCORER J. Williams COMMENTS Anticipated Stream Restoration Score

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE		PERCENT	TYPE		PERCENT
☐ ☐	BLDR SLABS **[16 pts]**		☒ ☐	SILT **[3 pt]**	10
☐ ☐	BOULDER (>256 mm) **[16 pts]**		☐ ☒	LEAF PACK/WOODY DEBRIS **[3 pts]**	
☐ ☐	BEDROCK **[16 pts]**		☐ ☐	FINE DETRITUS **[3 pts]**	
☐ ☐	COBBLE (65-256 mm) **[12 pts]**	20	☐ ☐	CLAY or HARDPAN **[0 pt]**	10
☐ ☐	GRAVEL (2-64 mm) **[9 pts]**	30	☐ ☐	MUCK **[0 pts]**	
☐ ☐	SAND (<2 mm) **[6 pts]**	30	☐ ☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 20 **(A)** 15 **(B)** 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points — Substrate Max = 40: 20 — A + B

2. Maximum Pool Depth (***Measure the maximum pool depth within the 61 meter (200 feet)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters **[20 pts]**
- ☒ > 22.5 - 30 cm **[30 pts]**
- ☐ > 10 - 22.5 cm **[25 pts]**
- ☐ 5 cm - 10 cm **[15 pts]**
- ☐ < 5 cm **[5pts]**
- ☐ NO WATER OR MOIST CHANNEL **[0pts]**

COMMENTS None **MAXIMUM POOL DEPTH (centimeters):** 25

Pool Depth Max = 30: 30

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

- ☐ > 4.0 meters (> 13') **[30 pts]**
- ☒ > 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") **[20 pts]**
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
- ☐ ≤ 1.0 m (≤ 3' 3") **[5 pts]**

COMMENTS None **AVERAGE BANKFULL WIDTH (meters):** 3.5

Bankfull Width Max=30: 25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream *

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS None

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- ☒ Stream Flowing
- ☐ Subsurface flow with isolated pools (interstitial)
- ☐ Moist Channel, isolated pools, no flow (intermittent)
- ☐ Dry channel, no water (ephemeral)

COMMENTS None

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☒ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 error ±) ☐ Flat to Moderate ☒ Moderate (2 error ±) ☐ Moderate to Severe ☐ Severe (10 error ±)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: N/A Quantity: N/A

Photo-documentation Notes: N/A

Elevated Turbidity?(Y/N): No Canopy (% open): 0

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures:Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: Newly relocated/restored stream channel

Additional comments/description of pollution impacts: None

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) No Species observed (if known): N/A

Comments Regarding Biology: None

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Please refer to the provided stream relocation/restoration plans

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

OhioEPA

QHEI Score: **65**

Stream & Location: Stream 11 - Proposed Buckeye Yard Redevelopment *RM:* 5.1 *Date:* 08/ 30 / 21

Anticipated Stream Restoration Score *Scorers Full Name & Affiliation:* Justin Williams, Kimley-Horn

River Code: 05060001-12-05 *STORET #:* N/A *Lat./ Long.:* (NAD 83 - decimal º) **39.993314, -83.134676** *Office verified location* ☒

1] *SUBSTRATE* Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES		POOL	RIFFLE
☐	☐ BLDR /SLABS [10]		
☐	☐ BOULDER [9]	10	5
☐	☐ COBBLE [8]	15	25
☒	☐ GRAVEL [7]	25	40
☐	☒ SAND [6]	25	20
☐	☐ BEDROCK [5]		

OTHER TYPES		POOL	RIFFLE
☐	☐ HARDPAN [4]	10	5
☐	☐ DETRITUS [3]	5	5
☐	☐ MUCK [2]	5	
☐	☐ SILT [2]	5	
☐	☐ ARTIFICIAL [0]		

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☒ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☐ MODERATE [-1]
- ☒ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☐ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☒ NORMAL [0]
- ☐ NONE [1]

Substrate **16** *Maximum 20*

Comments
Newly Relocated/Restored Stream Channel

2] *INSTREAM COVER* Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 0 UNDERCUT BANKS [1]
- 2 OVERHANGING VEGETATION [1]
- 1 SHALLOWS (IN SLOW WATER) [1]
- 0 ROOTMATS [1]
- 2 POOLS > 70cm [2]
- 0 ROOTWADS [1]
- 2 BOULDERS [1]
- 0 OXBOWS, BACKWATERS [1]
- 0 AQUATIC MACROPHYTES [1]
- 2 LOGS OR WOODY DEBRIS [1]

AMOUNT
Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☒ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover Maximum 20 **14**

Comments
None

3] *CHANNEL MORPHOLOGY* Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☒ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☒ GOOD [5]
- ☐ FAIR [3]
- ☐ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☒ RECOVERING [3]
- ☐ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☒ MODERATE [2]
- ☐ LOW [1]

Channel Maximum 20 **13**

Comments
None

4] *BANK EROSION AND RIPARIAN ZONE* Check **ONE** in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION

L	R	
☐	☐	NONE / LITTLE [3]
☒	☒	MODERATE [2]
☐	☐	HEAVY / SEVERE [1]

RIPARIAN WIDTH

L	R	
☐	☐	WIDE > 50m [4]
☒	☒	MODERATE 10-50m [3]
☐	☐	NARROW 5-10m [2]
☐	☐	VERY NARROW < 5m [1]
☐	☐	NONE [0]

FLOOD PLAIN QUALITY

L	R	
☒	☒	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

L	R	
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10 **8**

Comments
None

5] *POOL / GLIDE AND RIFFLE / RUN QUALITY*

MAXIMUM DEPTH
Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☒ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH
Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☒ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY
Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☒ FAST [1]
- ☒ MODERATE [1]
- ☒ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current Maximum 12 **6**

Comments
None

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☒ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☒ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☒ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☒ MODERATE [0]
- ☐ EXTENSIVE [-1]

Riffle / Run Maximum 8 **0**

Comments
None

6] *GRADIENT* (30.6 ft/mi)

- ☐ VERY LOW - LOW [2-4]
- ☒ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (0.36 mi²)

%POOL: 30 %GLIDE: 20
%RUN: 20 %RIFFLE: 30

Gradient Maximum 10 **8**

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass- 2nd

- [ ] HIGH [ ]
- [ ] UP [ ]
- [x] NORMAL [ ]
- [ ] LOW [ ]
- [ ] DRY [ ]

DISTANCE

- [ ] 0.5 Km
- [x] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CLARITY

1st --sample pass-- 2nd

- [x] < 20 cm [ ]
- [ ] 20-<40 cm [ ]
- [ ] 40-70 cm [ ]
- [ ] > 70 cm/ CTB [ ]
- [ ] SECCHI DEPTH [ ]

1st pass _____ cm

2nd _____ cm

CANOPY

- [x] > 85%- OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Yes, stream channel recently relocated and restored

B] AESTHETICS

- [ ] NUISANCE ALGAE
- [ ] INVASIVE MACROPHYTES
- [ ] EXCESS TURBIDITY
- [ ] DISCOLORATION
- [ ] FOAM / SCUM
- [ ] OIL SHEEN
- [ ] TRASH / LITTER
- [ ] NUISANCE ODOR
- [ ] SLUDGE DEPOSITS
- [ ] CSOs/SSOs/OUTFALLS

C] RECREATION

POOL: [ ] >100ft² [ ] >3ft (AREA DEPTH)

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

Please refer to the provided stream relocation/restoration plans

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 65

Stream & Location: Stream 12 - Proposed Buckeye Yard Redevelopment **RM:** 5.1 **Date:** 08/ 30 / 21

Anticipated Stream Restoration Score **Scorers Full Name & Affiliation:** Justin Williams, Kimley-Horn

River Code: 05060001-12-05 **STORET #:** N/A **Lat./ Long.:** (NAD 83 - decimal °) 39.990095, -83.134275 **Office verified location** ☒

1] SUBSTRATE

Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]	10	5
☐ ☐ BOULDER [9]	10	5	☐ ☐ DETRITUS [3]	5	5
☐ ☐ COBBLE [8]	15	25	☐ ☐ MUCK [2]	5	
☒ ☐ GRAVEL [7]	25	40	☐ ☐ SILT [2]	5	
☐ ☒ SAND [6]	25	20	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN	QUALITY
☐ LIMESTONE [1]	☐ HEAVY [-2]
☒ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☒ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	SILT
☐ RIP/RAP [0]	☐ EXTENSIVE [-2]
☐ LACUSTURINE [0]	☐ MODERATE [-1]
☐ SHALE [-1]	☒ NORMAL [0]
☐ COAL FINES [-2]	☐ NONE [1]
	EMBEDDEDNESS

Comments

Newly Relocated/Restored Stream Channel

Substrate **16** *Maximum 20*

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0	UNDERCUT BANKS [1]	2	POOLS > 70cm [2]	0	OXBOWS, BACKWATERS [1]
2	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES [1]
1	SHALLOWS (IN SLOW WATER) [1]	2	BOULDERS [1]	2	LOGS OR WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT

Check ONE (*Or 2 & average*)

☐ EXTENSIVE >75% [11]
☒ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

None

Cover *Maximum 20* **14**

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☒ MODERATE [3]	☒ GOOD [5]	☐ RECOVERED [4]	☒ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☒ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

None

Channel *Maximum 20* **13**

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☒ ☒ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☒ ☒ MODERATE [2]	☒ ☒ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

None

Riparian *Maximum 10* **8**

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check **ONE** (*ONLY!*)

☐ > 1m [6]
☐ 0.7-<1m [4]
☒ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (*Or 2 & average*)

☐ POOL WIDTH > RIFFLE WIDTH [2]
☒ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]
☐ VERY FAST [1]
☒ FAST [1]
☒ MODERATE [1]
☒ SLOW [1]
☐ INTERSTITIAL [-1]
☐ INTERMITTENT [-2]
☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments **None**

Pool / Current *Maximum 12* **6**

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☒ BEST AREAS 5-10cm [1]	☒ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments **None**

Riffle / Run *Maximum 8* **0**

6] GRADIENT

(32.2 ft/mi)

DRAINAGE AREA (0.37 mi²)

☐ VERY LOW - LOW [2-4]
☒ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 30 %GLIDE: 20
%RUN: 20 %RIFFLE: 30

Gradient *Maximum 10* **8**

A] SAMPLED REACH

Check ALL that apply

METHOD

- [ ] BOAT
- [x] WADE
- [ ] L. LINE
- [ ] OTHER

STAGE

1st -sample pass- 2nd

- [ ] HIGH [ ]
- [ ] UP [ ]
- [x] NORMAL [ ]
- [ ] LOW [ ]
- [ ] DRY [ ]

DISTANCE

- [ ] 0.5 Km
- [x] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CLARITY

1st --sample pass-- 2nd

- [x] < 20 cm [ ]
- [ ] 20-<40 cm [ ]
- [ ] 40-70 cm [ ]
- [ ] > 70 cm/ CTB [ ]
- [ ] SECCHI DEPTH [ ]

1st pass _____ cm

2nd _____ cm

CANOPY

- [x] > 85%- OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Yes, stream channel recently relocated and restored

B] AESTHETICS

- [ ] NUISANCE ALGAE
- [ ] INVASIVE MACROPHYTES
- [ ] EXCESS TURBIDITY
- [ ] DISCOLORATION
- [ ] FOAM / SCUM
- [ ] OIL SHEEN
- [ ] TRASH / LITTER
- [ ] NUISANCE ODOR
- [ ] SLUDGE DEPOSITS
- [ ] CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: [ ] >100ft^2 [ ] >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:

Please refer to the provided stream relocation/restoration plans

Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3) 75

SITE NAME/LOCATION Buckeye Yard Redevelopment, Franklin County, Ohio 43228

SITE NUMBER Stream 13 RIVER BASIN Upper Scioto RIVER CODE 05060001 DRAINAGE AREA (mi²) 0.15

LENGTH OF STREAM REACH (ft) 200 LAT 39.986617 LONG -83.133978 RIVER MILE N/A

DATE 5/24/22 SCORER J. Williams COMMENTS Modified channel to outlet adjacent storm water pond

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type present). Check *ONLY* two predominant substrate *TYPE* boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B

TYPE		PERCENT	TYPE		PERCENT
☐ ☐	BLDR SLABS [16 pts]		☒ ☐	SILT [3 pt]	5
☐ ☐	BOULDER (>256 mm) [16 pts]		☐ ☒	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐ ☐	BEDROCK [16 pts]		☐ ☐	FINE DETRITUS [3 pts]	
☐ ☐	COBBLE (65-256 mm) [12 pts]	50	☐ ☐	CLAY or HARDPAN [0 pt]	
☐ ☐	GRAVEL (2-64 mm) [9 pts]	30	☐ ☐	MUCK [0 pts]	
☐ ☐	SAND (<2 mm) [6 pts]	5	☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 50

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 21 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 4

HHEI Metric Points — Substrate Max = 40: 25 (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61 meter (200 feet)* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☒ > 10 - 22.5 cm [25 pts]
- ☐ 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5pts]
- ☐ NO WATER OR MOIST CHANNEL [0pts]

COMMENTS None MAXIMUM POOL DEPTH (centimeters): 15

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check *ONLY* one box):

- ☐ > 4.0 meters (> 13') [30 pts]
- ☒ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS None AVERAGE BANKFULL WIDTH (meters) 3.9

Bankfull Width Max=30: 25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream *

RIPARIAN WIDTH (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☒	☒	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- ☒ Stream Flowing
- ☐ Subsurface flow with isolated pools (interstitial)
- ☐ Moist Channel, isolated pools, no flow (intermittent)
- ☐ Dry channel, no water (ephemeral)

COMMENTS Stream appears to be likely intermittent (originates at SW basin to the west)

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐ None ☐ 1.0 ☒ 2.0 ☐ 3.0
☐ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 km/km) ☐ Flat to Moderate ☒ Moderate (2 km/km) ☐ Moderate to Severe ☐ Severe (10 km/km)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Dry Run Distance from Evaluated Stream N/A
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: Hilliard/Galloway NRCS Soil Map Page: N/A NRCS Soil Map Stream Order: N/A

County: Franklin Township/City: Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: 5/22/2021 Quantity: 0.13 in

Photo-documentation Notes: Refer to attached photolog(s)

Elevated Turbidity?(Y/N): No Canopy (% open): 30

Were samples collected for water chemistry? (Y/N): No Lab Sample # or ID (attach results): N/A

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (umhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Yes If not, explain: None

Additional comments/description of pollution impacts: None

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) No Species observed (if known): N/A

Frogs or Tadpoles Observed? (Y/N) No Species observed (if known): N/A

Salamanders Observed? (Y/N) No Species observed (if known): N/A

Aquatic Macroinvertebrates Observed? (Y/N) No Species observed (if known): N/A

Comments Regarding Biology: None

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Please refer to the provided stream relocation/restoration plans

Appendix K: USACE Jurisdictional Determination

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO
ATTENTION OF:

June 14, 2022

Regulatory Division
North Branch

LRH-2021-551-SCR-Unnamed Tributary Scioto River

PRELIMINARY JURISDICTIONAL DETERMINATION

Ms. Gretchen Kendrick
Buckeye XO, LLC
2100 Ross Avenue, Suite 895
Dallas, Texas 75201

Dear Ms. Kendrick:

I refer to the *Jurisdictional Waters Delineation Report for Buckeye Yard Trabue and Roberts Roads Columbus, Franklin County, Ohio* dated July 7, 2021 and the *Additional Stream (Stream 13) Delineation Memorandum* dated 11 June 2022. You have requested a Preliminary Jurisdictional Determination (JD) for the potentially jurisdictional aquatic resources located within the review area. The review area is located north of Trabue Road and south of Roberts Road in the City of Columbus, Franklin County, Ohio (39.991777 latitude, -83.130647 longitude). Your request has been assigned the following file number: LRH-2021-551-SCR-Unnamed Tributary Scioto River. Please reference this file number on all future correspondence related to this JD request.

The United States Army Corps of Engineers' (Corps) authority to regulate waters of the United States is based on the definitions and limits of jurisdiction contained in 33 CFR 328 and 33 CFR 329. Section 404 of the Clean Water Act (Section 404) requires a Department of the Army (DA) permit be obtained prior to the discharge of dredged or fill material into waters of the United States, including wetlands. Section 10 of the Rivers and Harbors Act of 1899 requires a DA permit be obtained for any work in, on, over or under navigable water.

Based upon a review of the submitted report, this office has determined that approximately 7,412 linear feet of five (5) streams (Streams 9-13), 0.78 acre of two (2) wetlands (Wetlands 7-8), and 0.23 acre of one (1) open water impoundment are located within the JD review area and may be waters of the United States in accordance with the Regulatory Guidance Letter for JDs issued by the Corps on October 31, 2016 (Regulatory Guidance Letter No. 16-01). As indicated in the guidance, this Preliminary JD is non-binding and cannot be appealed (33 CFR 331.2) and only provides a written indication that waters of the United States, including wetlands, may be present on-site.

You have declined to exercise the option to obtain an approved JD in this instance and at this time for the aquatic resources mentioned above. However, for the purposes of the determination of impacts, compensatory mitigation, and other resource protection measures for

activities that require authorization from this office, these aquatic resources will be evaluated as if they are waters of the United States.

Enclosed please find a copy of the Preliminary JD. If you agree with the findings of this Preliminary JD and understand your options regarding the same, please sign and date a copy of the Preliminary JD form and return it to this office within 30 days of receipt of this letter. You should submit the signed copy electronically or to the following address:

United States Army Corps of Engineers
Huntington District
Attn: North Branch
502 Eighth Street
Huntington, West Virginia 25701

A copy of this letter will be provided to your agent, Mr. Justin Williams with Kimley-Horn and Associates, Inc. If you have any questions concerning the above information, please contact Ms. Katie Samples of the North Branch at 304-399-6933, by mail at the above address or by email at katie.e.samples@usace.army.mil.

Sincerely,

Laurie A. Moore
Regulatory Project Manager
North Branch

Enclosure(s)

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD)

FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 13 June 2022

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:
Ms. Gretchen Kendrick
Buckeye XO, LLC
2100 Ross Avenue
Dallas, Texas 75201

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
Huntington District, Buckeye Yard Redevelopment Project, LRH-2021-551-SCR-Unnamed Tributary Scioto River

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)
State: Ohio County/parish/borough: Franklin County City: Columbus
Coordinates of site (lat/long in degree decimal format):
Lat.: 39.991777 Long.: -83.130647
Universal Transverse Mercator: Zone 17
Name of nearest waterbody: Unnamed Tributary Scioto River

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
■ Office (Desk) Determination. Date: 14 June 2022
☐ Field Determination. Date:

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Stream 9	40.00236	-83.12951	320 linear feet	Non-wetland	Section 404
Stream 10	39.99726	-83.13266	2,552 linear feet	Non-wetland	Section 404
Stream 11	39.99333	-83.13414	3,921 linear feet	Non-wetland	Section 404
Stream 12	39.98991	-83.13470	369 linear feet	Non-wetland	Section 404
Stream 13	39.98612	-82.13437	250 linear feet	Non-wetland	Section 404

Wetland 7	39.99844	-83.13056	0.49 acre	Wetland	Section 404
Wetland 8	39.99730	-83.13108	0.29 acre	Wetland	Section 404
Pond 1	39.99715	-83.13184	0.23 acre	Non-wetland	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items: *Jurisdictional Waters Delineation Report for the Buckeye Yard Trabue and Roberts Road Columbus, Franklin County, Ohio* dated 7 July 2021 and *Additional Stream (Stream 13) Delineation Memorandum* dated 11 June 2022.

■ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Appendix 3- Wetland and Stream Delineation Map (JD, July 2021) and Figure Delineated Resources (JD, June 2022)

■ Data sheets prepared/submitted by or on behalf of the PJD requestor.
  ■ Office concurs with data sheets/delineation report.

  ☐ Office does not concur with data sheets/delineation report. Rationale:

☐ Data sheets prepared by the Corps:_____.

☐ Corps navigable waters' study:_____.

☐ U.S. Geological Survey Hydrologic Atlas:_____.
  ☐ USGS NHD data
  ☐ USGS 8 and 12 digit HUC maps.

■ U.S. Geological Survey map(s). Cite scale & quad name: Appendix 1- USGS Topographic Maps, Hilliard/Galloway Quads (JD, July 2021)

■ Natural Resources Conservation Service Soil Survey. Citation: Appendix 1- USDA Web Soil Survey Map (JD, July 2021)

■ National wetlands inventory map(s). Cite name: Appendix 1- National Wetland Inventory Map (JD, July 2021)

☐ State/local wetland inventory map(s):_____.

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation is:_____.(National Geodetic Vertical Datum of 1929)

■ Photographs: ■ Aerial (Name & Date): Appendix 2- Aerial Photographs (JD, July 2021)

or ■ Other (Name & Date): Appendix 4- Photos 21-44 (2021) and Attachment B (JD, June 2022)

■ Previous determination(s). File no. and date of response letter: LRH-2021-551-SCR dated 20 August 2021 (JD, July 2021)

■ Other information (please specify): Ohio EPA HUC Map-Site Location (JD, June 2022)

<u>IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.</u>

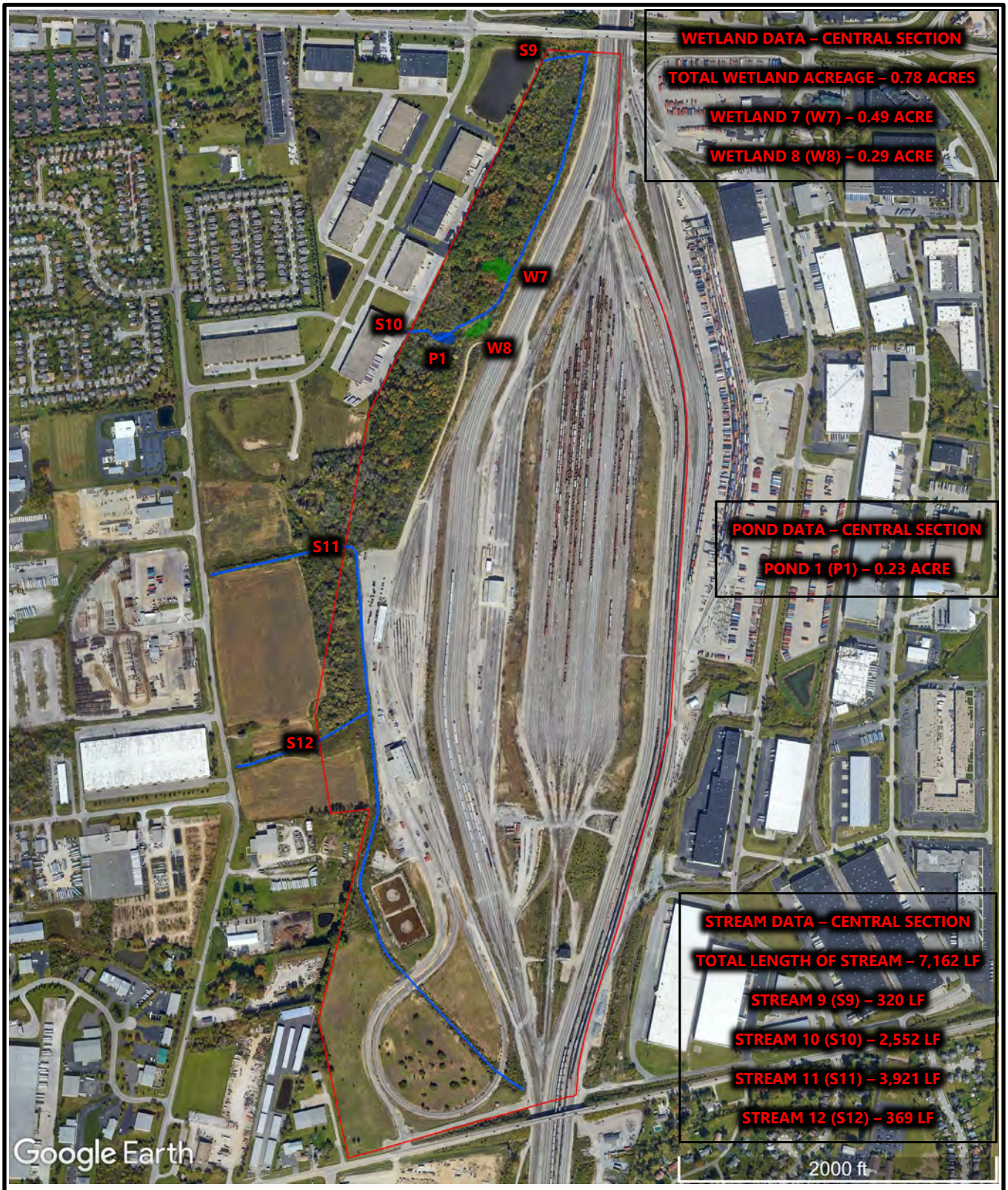
Katie E Samples 6/14/2022

Signature and date of Regulatory staff member completing PJD	Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

_____

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

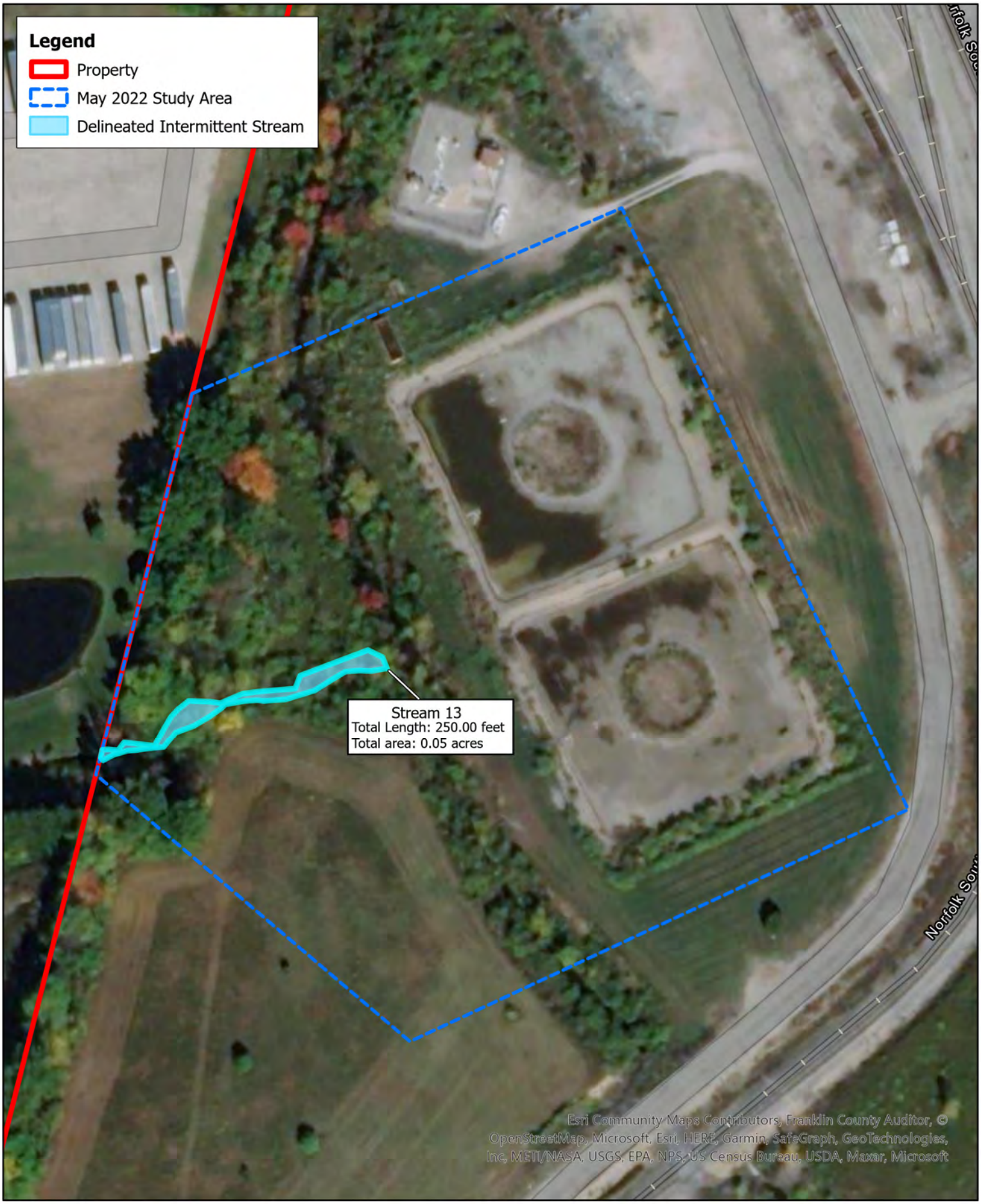
WETLAND AND STREAM DELINEATION MAP



NORTH

BUCKEYE YARD
TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

CENTRAL OHIO WETLAND CONSULTING, LLC



Kimley»Horn

0 50 100 US Feet

N

Figure 3. Delineated Resources
Columbus, Franklin County
Buckeye Yard Redevelopment

Appendix L: USACE Public Notice / OEPA Complete Application Letter

Public Notices by Year

- 2022 (4)
- 2021 (29)
- 2020 (50)
- 2019 (47)
- 2018 (30)
- 2017 (53)
- 2016 (46)
- 2015 (27)
- 2014 (55)
- 2013 (40)
- 2012 (46)

Disclaimer

The below listed documents may not be readable via Optical Character Recognition. To receive public notices via email for the **Huntington District Regulatory Division** please send an email to LRH.Permits@usace.army.mil indicating that you would like to be placed on the public notice electronic distribution list. Your email should include which state(s) **Ohio** and/or **West Virginia** in which you would like to receive public notices.

LRH 2021-551-SCR

CELRH-RDN

Published Feb. 2, 2022 /
Expiration date: 3/4/2022

1

PRINT | E-MAIL

TO WHOM IT MAY CONCERN: The following application has been submitted for a Department of the Army (DA) Permit under the provisions of Section 404 of the Clean Water Act.

APPLICANT: Ms. Gretchen Kendrick

Buckeye XO, LLC

2100 Ross Avenue, Suite 895

Dallas, Texas 75201

LOCATION: As depicted on the attached Sheet 1 of 3, the proposed project would be located north of Trabue Road and south of Roberts Road in the City of Columbus, Franklin County, Ohio (39.991777 latitude, -83.130647 longitude). The waters on site flow into an unnamed tributary to the Scioto River, a traditional navigable water of the United States.

DESCRIPTION OF PROPOSED WORK: The applicant has requested a DA authorization to discharge dredged and/or fill material into 0.78 acre of two (2) wetlands (Wetlands 7-8), 7,162 linear feet (1.97 acres) of four (4) streams (Streams 9-12), and 0.23 acre of one (1) open-water impoundment (Pond 1), as indicated on Table 1 of this Public Notice, in conjunction with the Buckeye Yard Development Project. Specifically, the project would involve the construction of eight (8) industrial logistics warehouse buildings and associated infrastructure such as a roadway, parking areas, trailer docks, and storm-water detention basins (Sheets 2-3 of 3).

ALTERNATIVES ANALYSIS: As a result of the proposal, dredged and/or fill material would be discharged into 0.49 acre of forested wetland, 0.29 acre of emergent wetland, 320 linear feet of intermittent stream, 6,842 linear feet of perennial stream, and 0.23 acre of open-water impoundment. The project does not require access, proximity to, or siting within special aquatic sites to fulfill its basic purpose and is considered a non-water dependent activity. The Section 404(b)(1) Guidelines state for non-water dependent activities, practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. The applicant has submitted an alternatives analysis and it is currently under review. A complete copy of the applicant's alternatives analysis can be reviewed by appointment at the above address or by submitting a request in accordance with the Freedom of Information Act. No permit will be issued until our review of the alternative analysis clearly demonstrates that practicable upland alternatives are not available to achieve the overall project purpose.

AVOIDANCE AND MINIMIZATION: In evaluating a project area containing waters of the United States, consideration must be given to avoiding impacts on these sites. If waters of the United States cannot be avoided, then the impacts must be minimized. Approximately 0.78 acre of two (2) wetlands, 7,162 linear feet of four (4) streams, and 0.23 acre of one (1) open-water impoundment are located within the site. Based on a review of the submitted report, the existing streams were previously re-routed and channelized around the existing railyard area and exhibit a high degree of bank erosion, limited substrate, and moderate to high turbidity. The proposed design would result in permanent impacts to the aforementioned aquatic resources located within the project area; however, stream habitat would be relocated and restored on-site. Stormwater management planning

mulch and/or earthen berms, temporary seeding, hay bales, inlet protection, temporary collection basins, diversion ditches, and construction entrances. All disturbed areas would be seeded and/or revegetated with native plant species and native seed mixes after completion of construction activities.

COMPENSATORY MITIGATION PLAN: To compensate for the loss of waters of the United States associated with the proposed project, the applicant has proposed to purchase 1.3 acre of forested wetland credits and 0.6 acre of non-forested wetland credits from the Little Scioto Wetland Mitigation Bank and restore 7,359 linear feet of open stream channel on-site. A stream relocation/restoration plan is currently being prepared by Kimley-Horn on behalf of the applicant. After review of all the submitted information, the Corps will determine if the type and level of compensatory mitigation are adequate in the event a decision is made to issue a DA authorization.

WATER QUALITY CERTIFICATION: The applicant must obtain a Section 401 Water Quality Certification (WQC) from the Ohio Environmental Protection Agency assuring that applicable laws and regulations pertaining to water quality are not violated. This Public Notice serves as the notification to the Administrator of the United States Environmental Protection Agency (USEPA) pursuant to Section 401(a)(2) of the Clean Water Act. If USEPA determines that the proposed discharge may affect the quality of the waters of any state other than the state in which the discharge will originate, it will so notify such other state, the district engineer, and the applicant. If such notice or a request for supplemental information is not received within 30 days of issuance of this Public Notice, the district engineer will assume the USEPA has made a negative determination with respect to Section 401(a)(2). If the USEPA determines another state's waters may be affected, such state has 60 days from receipt of the USEPA's notice to determine if the proposed discharge will affect the quality of its waters so as to violate any water quality requirement in such state, to notify the USEPA and the district engineer in writing of its objection to permit issuance, and to request a public hearing. If such occurs, the district engineer will hold a public hearing in the objecting state. A DA permit, if otherwise warranted, would not be issued on this project until the Section 401 WQC has been issued or waived and the Section 401(a)(2) process has been completed. The Reasonable Period of Time for the certifying authority (Ohio Environmental Protection Agency) to act on the Section 401 WQC will be 270 days from the date the Ohio Environmental Protection Agency receives a complete application in accordance with their requirements. A waiver may be explicit or will be deemed to occur if the Ohio Environmental Protection Agency fails or refuses to act on a request for certification within 270 days after receipt of a complete Section 401 WQC application.

HISTORIC AND CULTURAL RESOURCES: The National Register of Historic Places (NRHP) has been consulted and it has been determined there are no properties currently listed on the NRHP that would be indirectly or directly affected by the proposed work. One (1) previously identified archaeological site (33FR1319) is located within the project area; however, this resource was determined to be ineligible for inclusion onto the NRHP. In addition, the site has been extensively disturbed by previous development and contains poorly drained and urban complex soils, which indicate a low potential for significant intact archaeological sites. By letter dated September 27, 2021, the Ohio State Historic Preservation Office (Ohio SHPO) stated that no historic properties would be affected by the undertaking (2021-FRA-52518).

Based on this information, the Corps has determined that no historic properties listed on, or eligible for listing on the NRHP would be affected by the proposed development and mitigation activities. A copy of this Public Notice will be furnished to Ohio SHPO for their review and response.

THREATENED AND ENDANGERED SPECIES: The proposed project is located within the known or historic range of the endangered Indiana bat (*Myotis sodalis*), the threatened northern long-eared bat (*Myotis septentrionalis*), and the endangered Scioto madtom (*Noturus trautmani).*

Suitable habitat for the Scioto madtom may be present anywhere preferred habitat is found in Franklin County, Ohio. Habitat includes well-developed riffle/run/pool complexes with firm-bottomed sand, cobble, and/or gravel substrates. The proposed project area does not include suitable habitat for the Scioto madtom, and the utilization of BMPs would limit sedimentation downstream. Therefore, the Corps has determined the proposed project would have no effect on the Scioto madtom.

Suitable habitat for the Indiana bat and the northern long-eared bat may be present anywhere preferred habitat is found in Ohio. The Corps is not aware of any caves or abandoned mines in the proposed project area. The Corps is also not aware of any abandoned railroad tunnels in the project area that could provide winter habitat for the Indiana bat or the northern long-eared bat. Based on a review of the technical assistance letter (03E15000-2021-TA-2114) provided by the United States Fish and Wildlife Service (USFWS) on September 3, 2021, the large amount of proposed tree clearing relative to the available habitat in the immediately surrounding area may result in indirect adverse effects to the Indiana bat. The USFWS recommended a summer survey be conducted to determine the presence or absence of Indiana bats within the project area.

The summer survey is anticipated to be conducted in June 2022 as soon as the survey season begins. The Corps will initiate coordination with the USFWS upon receipt of the completed summer survey report. The DA permit will not be issued until the requirements of Section 7(c) of the Endangered Species Act of 1972 (as amended) are fulfilled.

Water Act (40 CFR Part 230). The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both the protection and the utilization of important resources. The benefit that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors that may be relevant to the proposal will be considered, including the cumulative effects thereof; among those factors are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

SOLICITATION OF COMMENTS: The Corps is soliciting comments from the public, federal, state and local agencies and officials, Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. For accuracy and completeness of the administrative record, all data in support of or in opposition to the proposed work should be submitted in writing (preferably via email if possible) setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition. Any person may request, in writing, within the comment period specified in the notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Written statements, either physical or electronic, received in this office on or before the expiration date of this Public Notice will become a part of the record and will be considered in the final determination. A permit will be granted unless its issuance is found to be contrary to the public interest.

CLOSE OF COMMENT PERIOD: Comments and requests for additional information should be submitted electronically to Katie Samples by email at Katie.E.Samples@usace.army.mil.

If you do not have internet access, comments may be submitted through the U.S. Postal Service

(USPS) to the following address:

United States Army Corps of Engineers

ATTN: CELRH-RD-N

Public Notice: LRH-2021-551-SCR

502 Eighth Street

Huntington, WV 25701-2070

Comments should only be provided through the USPS when electronic transmission is not possible. Precautionary internal mail handling procedures may be instituted to protect our workforce, which may result in longer than normal times to process and receive hard copy submissions. To be considered in our evaluation, comments submitted through the USPS should have a postmark dated on, or prior to, the close of the comment period listed on page one (1) of this Public Notice.

Table 1. Proposed Discharges of Dredged and/or Fill material into Waters of the United States associated with the Buckeye Yard Redevelopment Project.

Aquatic Resource ID	Latitude & Longitude (°N)	(°W)	Flow Regime or Cowardin Class	Estimated Amount of Aquatic Resource in Review Area	Linear Feet and/or Acres of Fill in Impact Area
Wetland 7	39.998444	-83.130556	Palustrine Forested	0.49 acre	0.49 acre
Wetland 8	39.997300	-83.131078	Palustrine Emergent	0.29 acre	0.29 acre

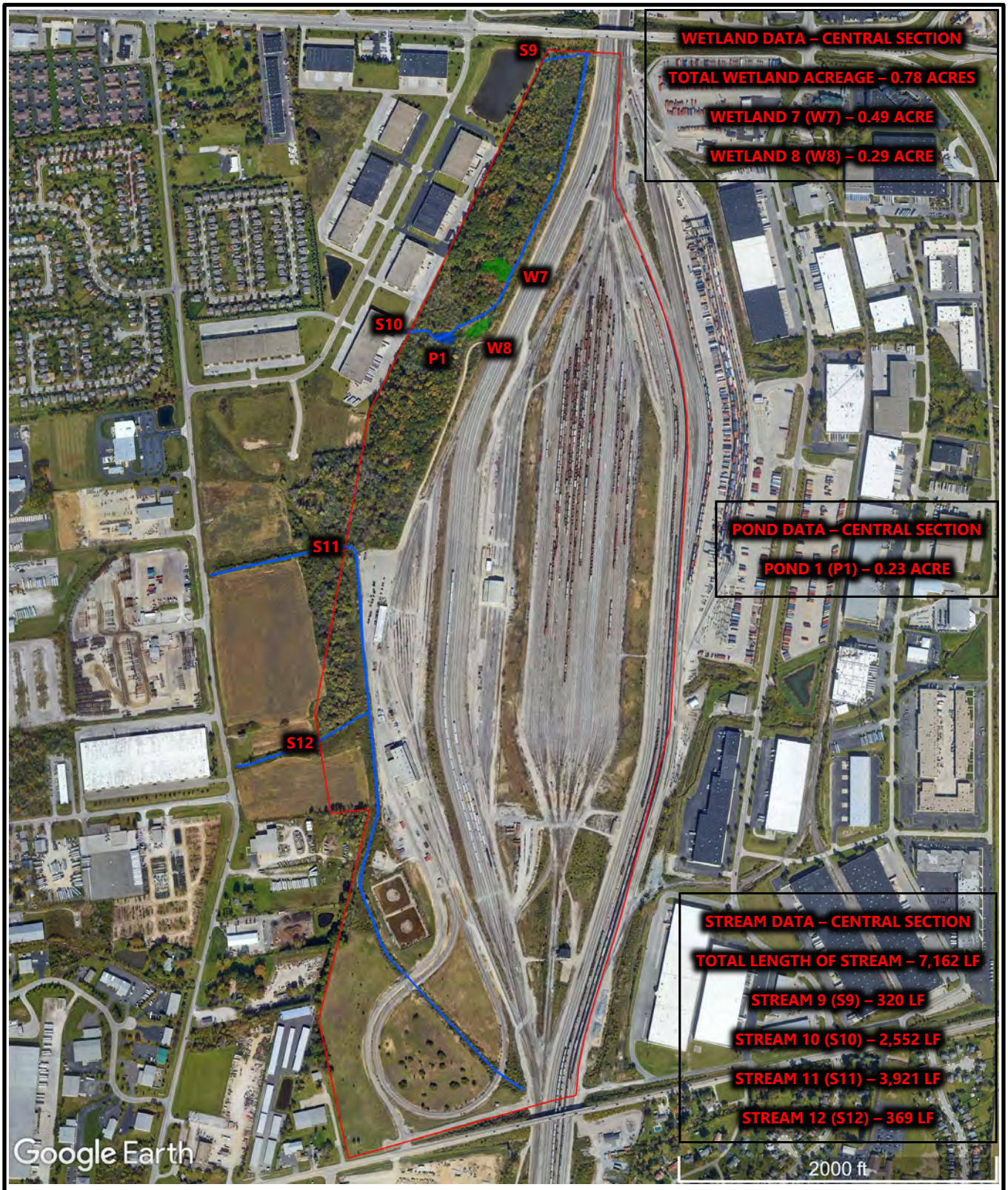
Stream 10	39.997258	-83.132658	Perennial	2,552 linear feet	2,552 linear feet (0.52 acre)
Stream 11	39.993333	-83.134142	Perennial	3,921 linear feet	3,921 linear feet (1.29 acres)
Stream 12	39.989911	-83.134697	Perennial	369 linear feet	369 linear feet (0.13 acre)
Pond 1	39.997153	-83.131842	Palustrine, Unconsolidated Bottom	0.23 acre	0.23 acre

Related Story: **LRH 2021-551-SCR Attachment 3**

Related Story: **LRH 2021-551-SCR Attachment 2**

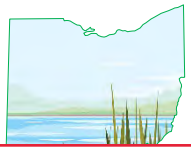
Related Story: **LRH 2021-551-SCR Attachment 1**

WETLAND AND STREAM DELINEATION MAP



NORTH

BUCKEYE YARD
TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007



CENTRAL OHI

LRH-2021-551-SCR
Franklin County, Ohio
Sheet 1 of 3

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

March 7, 2022

Transmitted Electronically

Justin Williams
Kimley-Horn and Associates, Inc.
795 North High Street, Suite 200
Columbus, OH 43235
justin.williams@kimley-horn.com

Re: Buckeye Yard
Permit - Intermediate
Correspondence
401 Wetlands
Franklin County
DSW401227686A

Subject: Complete Section 401 Water Quality Certification Application
Buckeye Yard Redevelopment
Corps Public Notice No. LRH-2021-551-SCR-UNT Scioto River
Ohio EPA ID No. 227686A

Dear Mr. Williams:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the section 401 water quality certification application received by the Agency on January 24, 2022, and subsequent information provided on February 10 and 14, 2022, and has determined that it is administratively complete.

Ohio EPA will act on this application by June 21, 2022 (180 days from the date of receipt of application, as established by the U.S. Army Corps of Engineers). To determine the action that should be taken by the director, Ohio EPA may ask for additional information. You are encouraged to provide information requested during the technical review process in a timely manner as the lack of complete or inadequate plans may be grounds for a proposal to deny this certification.

Public Notice Requirements

As a part of the antidegradation review process, Ohio EPA must provide for public participation and intergovernmental coordination prior to taking action on all activities for which a section 401 water quality certification is required. In some instances, a public hearing may be required.

In accordance with section ORC 6111.30(C) the applicant is responsible for issuing a public notice regarding the application. In this specific case, Ohio EPA is not currently aware of significant public interest in this project nor does the information contained in the application indicate that a public hearing is mandatory pursuant to Ohio Administrative Code (OAC) 3745-1-05.

Attached is a draft public notice that Ohio EPA has prepared for this project. This notice

must be published in a newspaper of general circulation for the region in which the impacts are proposed to occur by **March 28, 2022**. Guidance for preparing the final public notice and getting it published in the correct newspaper is available at: https://epa.ohio.gov/static/Portals/35/401/APPLICANT%20PUBLIC%20NOTICE%20INSTRUCTION%20SHEET.pdf

You may find a copy of Ohio EPA's rules and laws online at https://epa.ohio.gov/dsw. Information regarding Ohio's Section 401 and Isolated Wetlands Permitting programs is also available online at https://epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/permitting/water-quality-certification-and-isolated-wetland-permits.

If you have any questions, please contact me at 740-380-5225 or via email at Carol.Siegley@epa.ohio.gov.

Sincerely,

Carol Siegley
Application Coordinator
401/Wetlands/Mitigation Section

CS/ms

Attachment

ec: Kayla Osbourne, Kayla.N.Osbourne@usace.army.mil, Department of the Army, Huntington District, Corps of Engineers
Gretchen Kendrick, Gretchenk@xebecrealty.com, Buckeye XO, LLC
Davis Bittner, DavisB@xebecrealty.com, Buckeye XO, LLC
Permit Processing Unit, Ohio EPA, DSW (epadswpermitsproces@epa.ohio.gov)
Rachel Taulbee, Rachel.Taulbee@epa.ohio.gov, Ohio EPA, DSW, SEDO

Date of Public Notice: **[DATE]** Franklin County

PUBLIC NOTICE
NOTICE OF RECEIPT OF 401 APPLICATION

Public notice is hereby given that the Ohio Environmental Protection Agency (Ohio EPA) Division of Surface Water (DSW) has received an application for and has begun to consider whether to issue or deny, a Clean Water Act Section 401 water quality certification for a project to provide large-scale industrial logistics warehouse space with proximate access to rail and highway infrastructure located on the west side of the city of Columbus in Franklin County (39.991777ºN/ -83.130647ºW). The application was submitted by Buckeye XO, LLC. The Huntington District Corps of Engineers Public Notice Number for this project is LRH-2021-551-SCR-Unnamed Tributary Scioto River. The Ohio EPA ID Number for this project is DSW401227686A.

Discharges from the activity, if approved, would result in degradation to, or lowering of, the water quality of Roberts Millikin Ditch. Ohio EPA will review the application, and decide whether to grant or deny the certification, in accordance with OAC Chapters 3745-1 and 3745-32. In accordance with OAC rule 3745-1-05, an antidegradation review of the application will be conducted before deciding whether to allow a lowering of water quality. No exclusions or waivers, as outlined by OAC rule 3745-1-05, apply or may be granted.

Starting **[DATE OF PUBLICATION]**, copies of the application and technical support information may be inspected on Ohio EPA-DSW website:

https://epa.ohio.gov/wps/portal/gov/epa/divisions-and-offices/surface-water/permitting/water-quality-certification-and-isolated-wetland-permits

Persons wishing to 1) be on Ohio EPA's interested parties mailing list for this project, 2) request a public hearing, or 3) submit written comments for Ohio EPA's consideration in reviewing the application should do so by email to epa.dswcomments@epa.ohio.gov or writing to Ohio EPA-DSW, Attention: Permits Processing Unit, P.O. Box 1049, Columbus, Ohio 43216-1049 within thirty days of the date of this public notice.

Appendix M: Previous Wetlands Delineation Report

Kimley»Horn

MEMORANDUM

To:	Davis Bittner, Vice President *Buckeye XO, LLC*
From:	Justin S. Williams, PWS *Kimley-Horn and Associates Inc.*
Date:	June 11, 2022
Subject:	*Additional Stream (Stream 13) Delineation Memorandum* *Buckeye Rail Yard Redevelopment* *Columbus, Franklin County, Ohio*

INTRODUCTION & BACKGROUND

Kimley-Horn and Associates, Inc. (Kimley-Horn) is pleased to submit this letter to Buckeye XO, LLC, which summarizes the findings of a Wetlands and Waterways Delineation site visit which was conducted on May 24th, 2022. The site visit was conducted after a recent meeting with the City of Columbus which identified an additional aquatic resource onsite which may be considered a regulated aquatic resource under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and/or the Ohio Environmental protection Agency (Ohio EPA).

PROPERTY LOCATION & DESCRIPTION

The Buckeye Yard Redevelopment property and project encompasses approximately 279.19 acres of former Norfolk-Southern rail yard acreage located at 4882 Trabue Road (north of Trabue Road and south of Roberts Road), Columbus, Franklin County, Ohio 43228, herein referred to as the "Site". The Franklin County Auditor's office identifies the Site as parcel numbers 560-154558 and 560-184817. Approximate latitude/longitude coordinates for the central part of the Site are 39.991777, -83.130647. A Site location map and topographic map are provided as **Figure 1/2** in **Appendix A**.

BACKGROUND

Central Ohio Wetland Consulting, LLC (COWC) completed a Jurisdictional Waters Delineation Report for the site dated July 7, 2021, which identified four (4) jurisdictional streams onsite (Stream 9, 10, 11, and 12) and two (2) jurisdictional wetland habitat areas (Wetland 7 and Wetland 8). No non-jurisdictional (isolated) aquatic resources were identified or delineated as occurring on the Site. COWC further submitted for and obtained an Approved Jurisdictional Determination (AJD) for the Property, dated August 20, 2021 (USACE No. LRH-2021-551-SCR-UNT Scioto River).

As part of the proposed Buckeye Yard Redevelopment project and associated Clean Water Act Section 404/401 permit requirement, Kimley-Horn obtained a revised Preliminary Jurisdictional Determination

(PJD), dated February 14, 2022 (USACE No. LRH-2021-551-SCR-UNT Scioto River) due to relatively recent changes in the Clean Water Act regulatory guidance which required a new JD to be issued under the guidance at the time of the associated USACE public notice issuance for the proposed project.

Kimley-Horn staff conducted a site visit with City of Columbus personnel on May 4th, 2022, as part of the City of Columbus engineering design approval and Type III stormwater variance approval processes, to walk the Site and get an overall view of current site conditions and associated aquatic resources. City of Columbus personnel indicated that a drainage feature appeared present during their desktop review that was not identified in the COWC delineation report, nor was it included in either of the previously issued USACE jurisdictional determinations for the Site.

PHYSICAL SETTING SOURCES

The following physical setting sources were reviewed to determine if wetland or other potentially regulated aquatic resources were present on the Site which had yet to be identified or delineated.

USFWS National Wetlands Inventory Map

Based on Kimley-Horn's review of the United States Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) on-line wetlands mapper, a riverine polygon is depicted as present in the approximate location of the currently delineated Stream 13 resource. A copy of the NWI Map is provided in **Appendix B**.

USGS Topographic Map

Review of the United States Geological Survey (USGS) Topographic Map, Hilliard/Galloway, Ohio (1973), indicates that an intermittent stream is depicted in the approximate location of the currently delineated Stream 13 resource. A copy of the topographic map is provided as **Figure 2** in **Appendix A**.

SITE RECONNAISSANCE

Kimley-Horn therefore conducted a follow up Wetlands and Waterways Delineation site visit on May 24th, 2022, which identified one (1) additional intermittent stream located on the southwest portion of the Site, which had not been identified/delineated or included in any of the previously completed reporting for the Site. The identified and delineated stream is listed below with applicable information:

Stream 13 (250.00 linear feet)
Stream 13 is a west to east flowing intermittent stream located on the southwest portion of the Site. Stream 13 appears to originate approximately 3,000 feet west of the Site which is fed by a storm water basin surrounded by development. The storm water basin is surrounded by development and outflows into the Stream 13 channel which flows east (downstream) under Atlas Street and Walcutt Road before flowing onto the Site. Approximately 250 linear feet of Stream 13 is present on the Site, which carries intermittent flow east into the previously delineated Stream 11, which proceeds to flow southeast. A

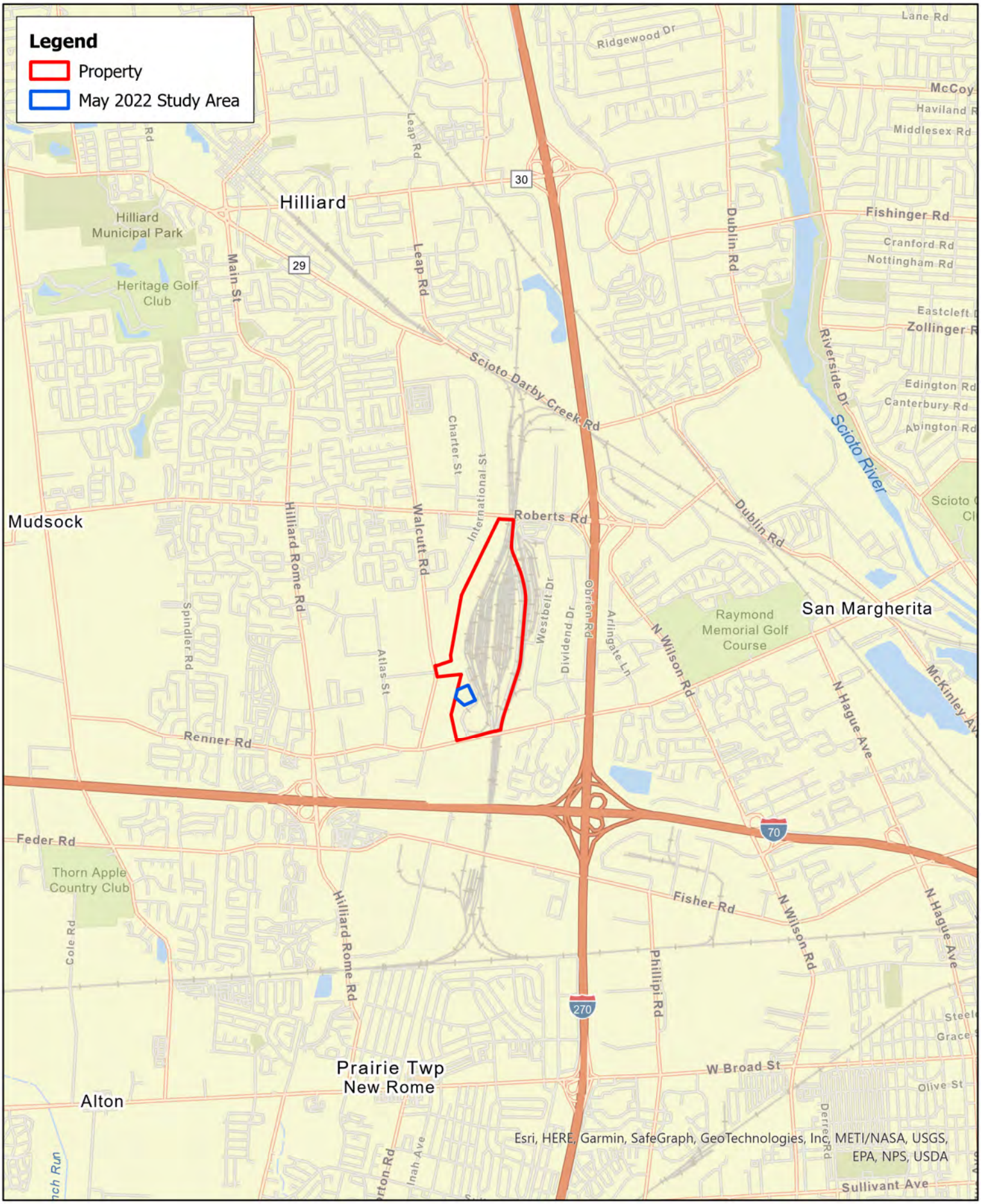
map of the delineated Stream 13 feature is provided as **Figure 3** in **Appendix A**. A photographic log of the Stream 13 feature is provided in **Appendix B**.

CONCLUSIONS/RECOMMENDATIONS

Based upon the review of the physical setting sources and information obtained during the delineation Site reconnaissance, Kimley-Horn identified and delineated one (1) potentially regulated aquatic resource (Stream 13) which was not previously identified or delineated during in the original delineation report and subsequent USACE jurisdictional determinations. Based on Kimley-Horn's assessment of the Stream 13 feature, associated habitat and flow characteristics, and current regulatory guidance, Stream 13 is likely considered a water of the United States (WOTUS) and regulated by the USACE. The anticipated regulatory status of the delineated resource is based on best professional judgement and has not been verified with the USACE Huntington District.

ATTACHMENT A

Figures

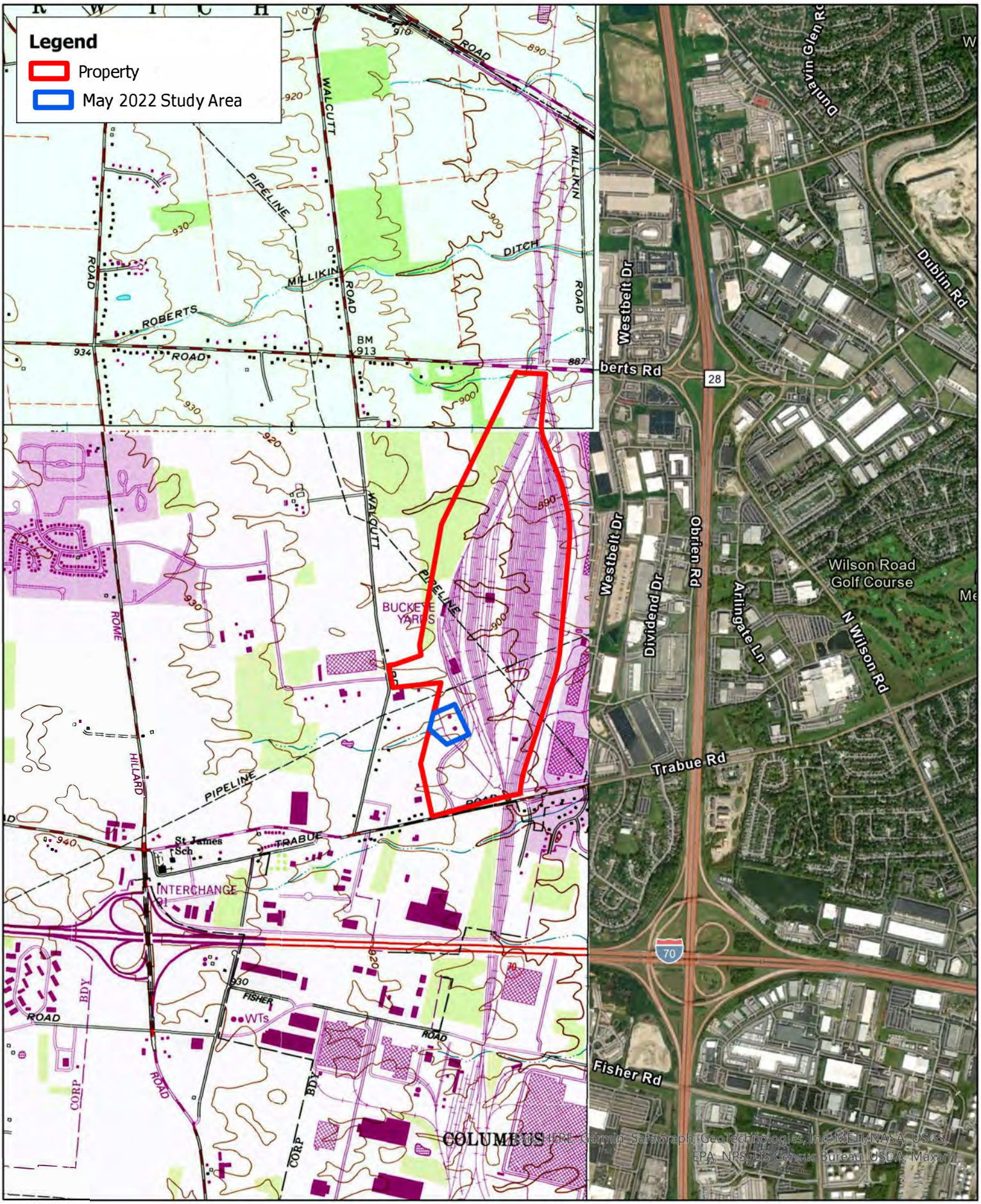


Kimley»Horn

0 2,000 4,000 Feet

N

Figure 1. Project Location
Columbus, Franklin County
Buckeye Yard Redevelopment

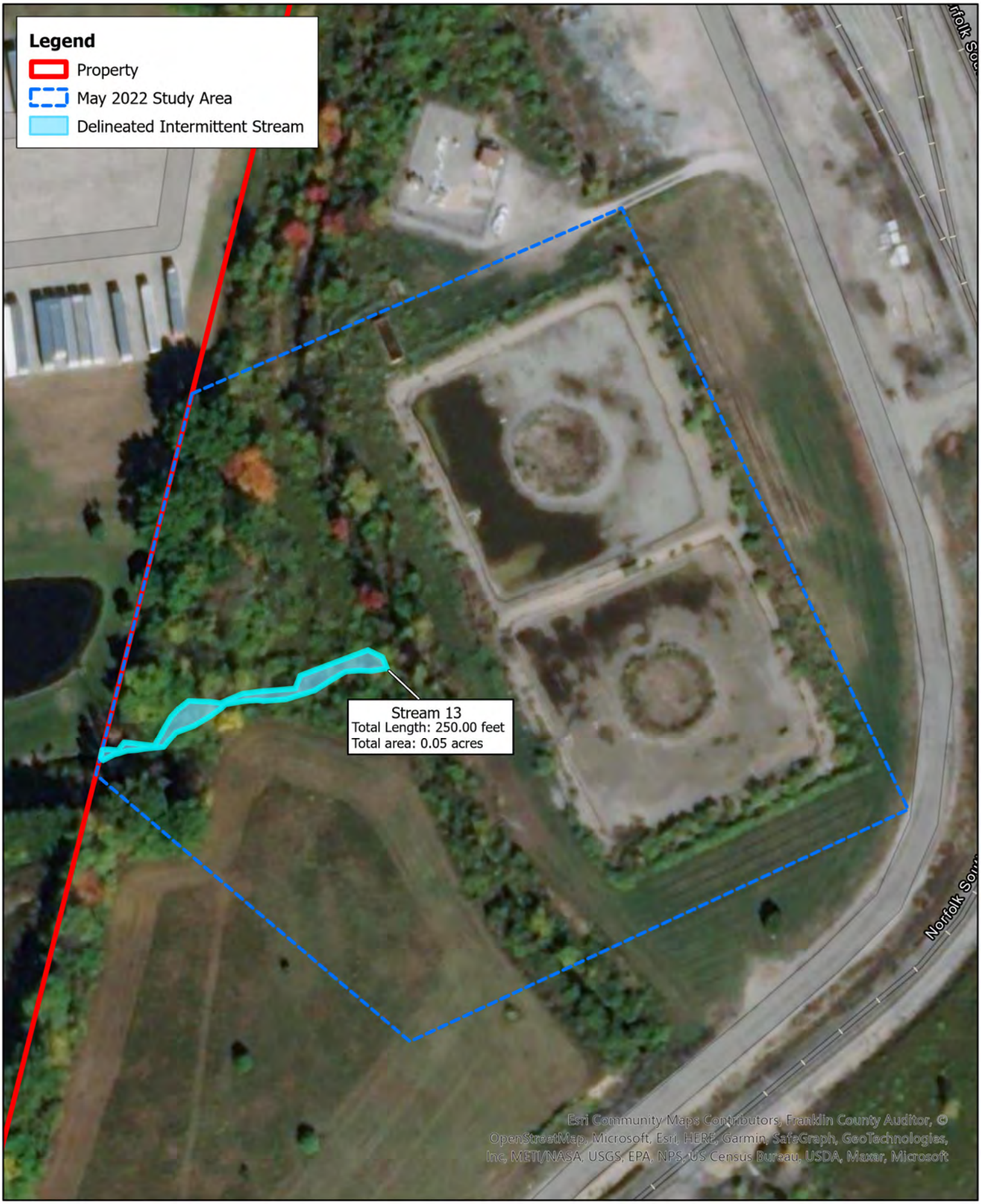


Kimley»Horn

0 1,000 2,000 US Feet

N

Figure 2. 1:24k USGS Topographic Map
Columbus, Franklin County
Buckeye Yard Redevelopment



Kimley»Horn

0 50 100 US Feet

N

Figure 3. Delineated Resources
Columbus, Franklin County
Buckeye Yard Redevelopment

ATTACHMENT B

Photographic Log

Photo 1: View of the Stream 13 corridor (shrub area) facing north. Photo taken just southwest of where Stream 13 flows east into Stream 11 (near yellow pipeline markers).

Photo 3: View of the cross section of the Stream 13 channel facing north, located just west (upstream) of the confluence with Stream 11.

Photo 2: View of the confluence of Stream 13 (left side) as it flows east (downstream) into Stream 11. Stream 11 is impounded at this located due to beaver dams.

Photo 4: View of the central portion of Stream 11 facing upstream (west).

Photo 5: View of the central portion of Stream 11 facing downstream (east).

Photo 7: View of the western (upstream) offsite portion of Stream 13 located just west (upstream) of the Site boundary facing west (upstream).

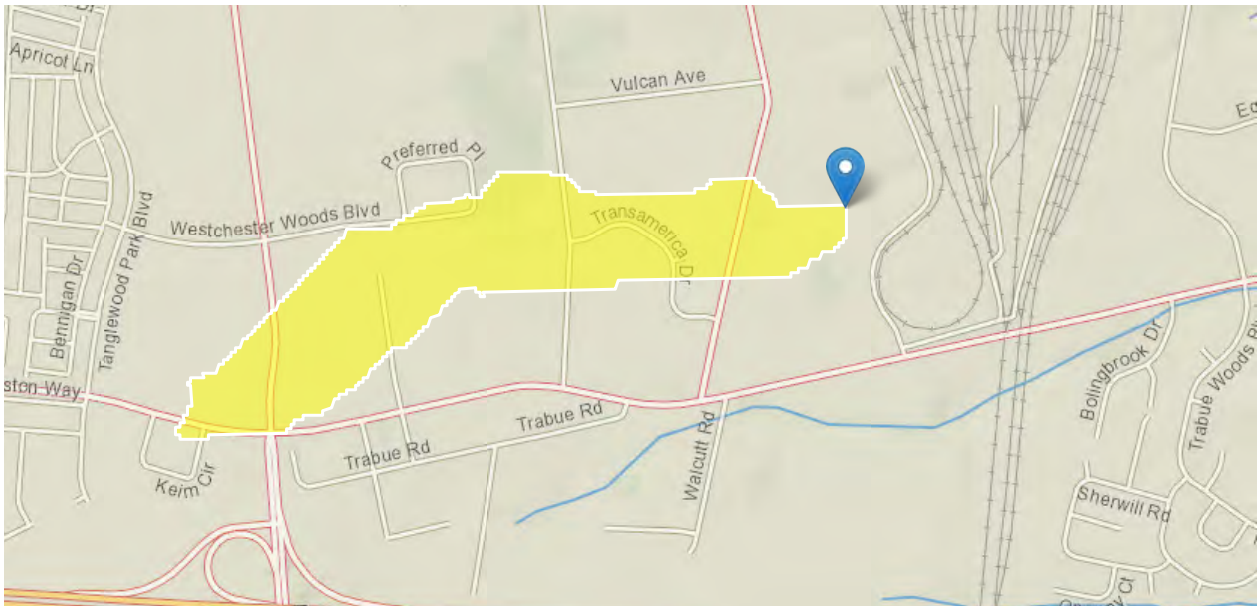
Photo 6: View of the western (upstream) Site boundary (fencing) located just east of a storm water outflow pipe (just offsite). Photo taken facing west (upstream).

ATTACHMENT C

Supporting Documentation

Stream 13 - StreamStats Report

Region ID: OH
Workspace ID: OH20220610005818044000
Clicked Point (Latitude, Longitude): 39.98612, -83.13437
Time: 2022-06-09 20:58:40 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.15	square miles
LAT_CENT	Latitude of Basin Centroid	39.9846	decimal degrees
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	0.45	percent
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.65	dimensionless

General Flow Statistics

General Flow Statistics Parameters [Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.15	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	0.45	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.65	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.9846	decimal degrees	38.68	41.2

General Flow Statistics Flow Report [Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	0.0106	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.9.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.0

Ohio EPA HUC Map - Site Location

2/4/2022, 10:33:58 AM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Watershed Assessment Units (HUC12)

Maxar, USGS The National Map: National Hydrography Dataset. Data refreshed January, 2022.

Ohio EPA
Division of Surface Water

WAU boundaries: Dry Run-Scioto River

HUC12 WAU	050600011205
HUC12 Spaced	05060001 12 05
Assessment Unit Name	Dry Run-Scioto River
WAULabel1	Dry Run
WAULabel2	Scioto R.
Acres	15,769.51
Sq_MILES	24.64
Sq_Km	63.82

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JURISDICTIONAL WATERS DELINEATION REPORT

BUCKEYE YARD
TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO

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REPORT ISSUED APRIL 20, 2021
REPORT REVISED JULY 7, 2021
COWC PROJECT #120120007

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APPENDIX 1 – MAPS AND EVALUATION AREA INFORMATION

General Location Map of Evaluation Area
Location Map of Evaluation Area
Franklin County Auditor GIS Map
1954/1955, 1966, 1973, 1980/1981, and 2019 USGS Topographic Maps
USDA Web Soil Survey Map
National Wetlands Inventory (NWI) Map

APPENDIX 2 – AERIAL PHOTOGRAPHS

1956 Aerial Photograph
1964 Aerial Photograph
1979 Aerial Photograph
1989 Aerial Photograph
1994 Aerial Photograph
2002 Aerial Photograph
2009 Aerial Photograph
2019 Aerial Photograph

APPENDIX 3 – DELINEATION MAP

Wetland and Stream Delineation Map
Midwest Region Wetland Determination Data Forms (6 pages)
ORAM Scoresheets (20 pages)

APPENDIX 4 – EVALUATION AREA PHOTOGRAPHS

Photo Key
Field Reconnaissance Photos (Photo 21 through Photo 44)

1.0 INTRODUCTION AND PURPOSE

Central Ohio Wetland Consulting, LLC (COWC) has been contracted by Kimley-Horn and Associates, Inc. (Client) to perform a Jurisdictional Waters Delineation Report for the Buckeye Yard property located in the City of Columbus, Franklin County, Ohio. The "evaluation area" for this Jurisdictional Waters Delineation Report comprises 287± acres of land located north of Trabue Road and south of Roberts Road, identified by Franklin County parcel 560-154558. The evaluation area consists of former Norfolk-Southern railroad acreage, including former rail lines and ballast material, ancillary structures, open areas, waste land, and wooded land.

The purpose of COWC's services is to document the size/length, location, and quality of all potentially jurisdictional waters of the United States and/or isolated waters of the State of Ohio within the evaluation area. COWC performed this delineation for specific application to the evaluation area described herein, in accordance with the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (1987) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. The conclusions made within this Jurisdictional Waters Delineation Report are to be considered "preliminary" until verified by the USACE Huntington, WV District Office. This delineation report can be submitted to the USACE as part of a preliminary jurisdictional determination (PJD), approved jurisdictional determination (AJD), or pre-construction notification (PCN). The Ohio Environmental Protection Agency (Ohio EPA) will require a copy of the delineation report and an AJD letter issued by the USACE for all isolated wetland impacts, and ephemeral stream impacts greater than 300 linear feet.

The delineation includes three principal components: 1) research and review of published information, 2) field reconnaissance and delineation of jurisdictional waters (i.e. wetlands, ponds, and streams), and 3) data compilation/report preparation.

1.1 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This Jurisdictional Waters Delineation Report has been prepared based upon field observations and COWC's professional interpretation of the USACE Wetlands Delineation Manual (1987) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region at the time of our field reconnaissance. The conclusions presented in this report are professional opinions based on data collected between the commencement date and the report date. The information in this report is true to the best of our knowledge. COWC obtained some of the information presented in this report from other agencies and sources. COWC assumes no responsibility for the accuracy or completeness of information provided by others. No warranty, expressed or implied, is made.

1.2 SPECIAL TERMS AND CONDITIONS

This report has been prepared by COWC as a professional service for the exclusive use of Kimley-Horn and Associates, Inc. and other parties that may be jointly affiliated by Kimley-Horn and Associates, Inc. and COWC. Any other entity that wishes to use or rely upon this report, or that wishes to duplicate, reproduce, copy, extract, or quote from this report must request permission from COWC to do so. Any unauthorized use of, or reliance upon, this report shall release COWC from any liability resulting from such use or reliance. Any unauthorized duplication, reproduction, copying, excerption, or quotation of this report shall expose the violator to all legal remedies available to COWC.

2.0 EVALUATION AREA AND SURROUNDING AREA CHARACTERISTICS

The evaluation area consists of former Norfolk-Southern railroad acreage, including former rail lines and ballast material, ancillary structures, open areas, waste land, and wooded land. The evaluation area consists of 287± acres of land located north of Trabue Road and south of Roberts Road, identified by Franklin County parcel 560-154558. Areas surrounding the evaluation area are developed for railroad, industrial, and commercial purposes. Approximate latitude / longitude coordinates for the central part of the evaluation area are 39.992969 / -83.129678.

Appendix 1 includes location maps, a Franklin County Auditor Geographic Information System (GIS) Map, United States Geological Survey (USGS) topographic maps (Hilliard, Ohio and Galloway, Ohio), United States Department of Agriculture (USDA) soil survey map, and the United States Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) map. Appendix 2 includes aerial photographs showing the evaluation area. Photographs depicting representative vegetation, property features, and views from several locations around the evaluation are provided in Appendix 4.

3.0 RESEARCH AND REVIEW OF PUBLISHED INFORMATION

COWC's research and review of published information includes: USGS topographic maps, the USDA soil survey map, USFWS NWI map, and aerial photographs from various local governmental agencies. COWC uses this information to determine historical uses of the evaluation area, the geo-morphological setting at the evaluation area, soil types present, whether the evaluation area has been significantly disturbed within the past few years, and for visual evidence of ponds, streams, or saturation or inundation on land surfaces, and the potential for wetlands. Copies of the reviewed information is appended.

3.1 USGS TOPOGRAPHIC MAPS

COWC reviewed 1954/1955, 1966, 1973, 1980/1981, and 2019 Hilliard, Ohio and Galloway, Ohio, USGS 7.5-minute series topographic maps for the evaluation area. COWC uses USGS topographic maps as an indicator of watershed characteristics in and around the evaluation area, and to identify small depressional areas,

streams, and wetland mapping symbols. The appendix of this report includes portions of these USGS maps showing the evaluation area.

The maps reviewed indicate the evaluation is predominately developed with rail lines on the 1973 through 2019 maps. Prior to 1973, the evaluation area is depicted as vacant land. The topographic maps show green tint, indicating wooded areas, on the northwest part of the evaluation area. One (1) wetland mapping symbol is also depicted within the green tint area on the northwest part of the evaluation area. Four (4) unnamed tributary streams are shown crossing the evaluation area in a general west to east direction on the 1954/1955 and 1966 maps. These tributary streams are not shown or have be redirected through or around rail lines on the 1973 through 2019 maps.

3.2 SOIL REVIEW

COWC reviewed information from the USDA Natural Resources Conservation Service (NRCS), the USDA Web Soil Survey website[1], and the list of Hydric Soils of the United States (published by NRCS in cooperation with the National Technical Committee for Hydric Soils). These sources indicate soils underlying the evaluation area consist of the following:

TABLE 1
EVALUATION AREA SOIL DESIGNATIONS

Map Unit ID	Map Unit Name	% Slope	Hydric Classification	% Hydric Component	Component Landform
CeB	Celina silt loam	2-6	Non-hydric with hydric components	Kokomo 5%	Depressions
CrA	Crosby silt loam	0-2	Non-hydric with hydric components	Kokomo 8%	Depressions
CrB	Crosby silt loam	2-6	Non-hydric with hydric components	Kokomo 8%	Depressions
Ko	Kokomo silty clay loam	0-2	Hydric	Kokomo 90%	Depressions
Us	Udorthents, loamy, steep	18-25	Non-hydric	-	-
Uv	Urban land-Celina complex, occasionally flooded	2-12	Non-hydric with hydric components	Kokomo 5%	Depressions

Celina silt loam (CeB) is generally described as a gently sloping, moderately well-drained soil on uplands. These soils are typically found on convex ridgetops, on side slopes above steeper areas, and along well-defined waterways.

Crosby silt loam (CrA and CrB) is generally described as a nearly level to gently sloping, somewhat poorly drained soil on narrow and broad upland areas. This mapping unit also contains areas of Kokomo soils located in depressions and Celina soils on low knolls.

[1] http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Kokomo silty clay loam (Ko) is described as a nearly level, very poorly drained soil located in depressions and at the heads of drainageways on uplands. Runoff from adjacent higher elevations can cause ponding in Kokomo soils. Kokomo silty clay loam is considered a hydric soil.

Udorthents, loamy, steep (Us) is generally described as soils in borrow areas that have been subject to surface mining, particularly for use as fill material used under highways and buildings.

Urban land-Celina complex (Uv) is generally described as areas of urban land covered by streets, parking lots, buildings, railroad yards, and other structures. Soils in these areas have been altered to the extent specific soil identification is not feasible. Undeveloped portions of this soil unit are dominated by Celina soil.

The evaluation area is predominately comprised of Urban land-Celina complex soils. Wooded areas adjacent to the west of existing railroad lines are mapped with Crosby, Celina, and Kokomo soil units.

According to mapping available from the USDA NRCS, and the list of Hydric Soils of the United States published by the NRCS in cooperation with the National Technical Committee for Hydric Soils, the evaluation area contains hydric soil. Thin bands of mapped hydric Kokomo soils are located on the western portions of the evaluation area. The USGS topographic maps indicate these areas are likely drained by tributary streams.

3.3 NATIONAL WETLANDS INVENTORY (NWI) MAP

COWC reviewed the USFWS NWI website[2] for wetland mapping symbols depicted within the evaluation area. The USFWS produced NWI maps in an attempt to document wetlands throughout the United States. The USFWS generated NWI maps using high-altitude infrared aerial photography to identify areas of saturation or inundation on land surfaces. Areas that are saturated or inundated typically have lower infrared heat signatures than dry areas. The USFWS mapped these cooler infrared heat signature areas as wetlands without field verification. NWI maps may not reflect actual field conditions due to meteorological or seasonal conditions that may have existed at the time of data collection. COWC typically uses NWI maps to plan field reconnaissance, and as an indicator of areas that may support wetlands.

The NWI map shows one (1) PFO1A wetland mapping symbol located within the wooded northwest part of the evaluation area. The PFO1A designation indicates an area that is palustrine (non-tidal wetlands dominated by trees, shrubs, persistent emergent vegetation), forested (containing woody vegetation 20 feet in height and taller), broad-leaved deciduous (trees and shrubs with relatively wide, flat leaves that are shed during the cold and seasonally dry conditions), and

[2] https://www.fws.gov/wetlands/Data/Mapper.html

temporary flooded (areas were surface water is present for brief (days/weeks) periods during the growing season). This area was delineated as Wetland 7.

The NWI map shows streams/drainages in similar locations as depicted on the USGS maps. Drainage features within the evaluation area are depicted with R5UBH an R4SBC designations. The R5UBH designation indicates a permanently flooded (water covers the substrate throughout the year in all years), riverine habitat contained within a channel (open conduit either naturally or artificially created which may periodically or continuously contain moving water) that has an unconsolidated bottom (at least 25% cover of particles less than 6-7 centimeters and vegetative cover less than 30%). The unknow perennial modifier indicates the drainage cannot be distinguished from lower perennial and upper perennial. The R4SBC designation indicates a seasonally flooded, riverine habitat contained within a channel that has intermittent flow (water may flow only part of the year).

3.4 AERIAL PHOTOGRAPHS

COWC reviewed aerial photographs of the evaluation area dated 1956, 1964, 1979, and 1989 available from the Ohio Department of Transportation Office of CADD & Mapping website[3]; and 1994, 2002, 2009, and 2019 from Google Earth Pro[4]. Copies of the aerial photographs showing the evaluation area are provided in Appendix 2.

The 1956 through 1964 aerial photographs generally depict the evaluation area as vacant land with numerous streams crossing from west to east.

The 1979 through 2019 aerial photographs generally depict the evaluation area as developed for use as a rail yard. Undeveloped wooded land is located on the western part of the evaluation area. Streams previously apparent crossing the evaluation from west to east have been manipulated, channelized, and relocated as part of development for rail use.

The 2019 aerial photograph indicates the evaluation area is similar in appearance to what was observed during our field reconnaissance on April 9, April 12, and April 13, 2021.

3.4.1 PUBLISHED INFORMATION REVIEW CONCLUSIONS

Information obtained from USGS topographic maps, NWI maps, and aerial photographs indicate the potential for streams, wetlands, and ponds within the evaluation area.

[3] http://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/Pages/default.aspx
[4] Earth Versions – Google Earth

The potential for wetlands and streams within an area cannot be determined solely from review of published information; therefore, an on-site investigation is required to verify current property conditions.

4.0 FIELD RECONNAISSANCE/DELINEATION OF JURISDICTIONAL WATERS

Matthew R. Kaminski, owner of Central Ohio Wetland Consulting, LLC, performed the field reconnaissance for the jurisdictional waters delineation during the morning and afternoon hours on Friday April 9, 2021, Monday April 12, 2021, and Tuesday April 13, 2021. Research and review of published information indicates physical property conditions were generally unchanged for several years prior to this delineation, such that the evaluation area was considered undisturbed for data collection. Therefore, the routine method was used in this assessment. Photographic documentation from the field reconnaissance and general landscape photographs are provided in Appendix 4.

COWC performs its field reconnaissance for jurisdictional waters delineations using criteria and guidance in the Corps of Engineers' Wetland Delineation Manual (USACE, 1987) and the 2010 Midwest Regional Supplement to the 1987 Wetland Delineation Manual. In this method, vegetation, hydrology, and soil criteria are used to identify jurisdictional/isolated wetlands. The delineation method and vegetation sampling methodology uses the procedures for Routine Determinations found in the 1987 and 2010 manuals.

To establish the presence of jurisdictional/isolated wetlands, three characteristics are required to be present. These wetland characteristics consist of hydric soils, a dominance of hydrophytic (i.e. wetland) vegetation, and wetland hydrology. All three criteria must be present for an area to be identified as wetland. These three criteria are defined and explained in detail in the Corps of Engineers' Wetland Delineation Manual (USACE, 1987) and the 2010 Midwest Regional Supplement to the 1987 Wetland Delineation Manual. The Wetlands Research Program of the USACE Waterways Experiment Station developed the manual in 1987. COWC followed the methods described in these manuals in performing the delineation.

Wetland and waterbody delineation of field-verified water features are made using COWC's professional judgment and interpretation of the USACE Jurisdictional Determination Form Instructional Guidebook (USACE, 2007). For the purposes of this report, "non-jurisdictional" or "excluded" is defined as aquatic features that are not regulated by the USACE under the provisions of Section 404 of the Clean Water Act (CWA). Isolated wetlands that do not have a surface water connection to waters of the U.S. and ephemeral streams are non-jurisdictional from the perspective of the USACE; however, are regulated by the Ohio EPA under the provisions of Section 401 of the CWA.

4.1 METHODOLOGY

After collecting pertinent information through the review of published information, COWC uses the routine method to determine if wetland areas exist within the evaluation area. The approach used for the routine determination is the plant community assessment procedure. This approach requires initial identification of representative plant community types in the subject area followed by characterization of vegetation, soils, and hydrology for each community type.

The evaluation area is assessed in accordance with guidelines from the USACE pertaining to potential jurisdictional waters of the United States and/or isolated waters of the State of Ohio. All potential wetlands, streams, and drainage ditches are followed to determine the flow regime and whether such features have a surface water connection to waters of the U.S.

The field investigation is conducted by walking and visually surveying the evaluation area, and in the vicinity, to collect wetland and stream data, as necessary. Upon identification of hydrophytic (wetland) and non-wetland communities, the wetland boundary is surveyed with a Spectra SP20 handheld Global Navigation Satellite System (GNSS) receiver with sub-meter accuracy. Field notes are taken at points where the dominant vegetation species change from wetland to upland or hydrologic or soil indicators become transitional. Areas saturated or inundated by surface water at the time of our field reconnaissance are presumed to contain hydric soil characteristics. COWC records observations concerning hydrology and vegetation on the appropriate Wetland Determination Data Form.

4.1.1 HYDRIC SOIL CRITERIA

COWC performs shovel test pits to characterize soil conditions and to evaluate the presence or absence of hydric soil features. A drain spade is used to collect soil samples from a maximum depth of approximately 20 inches below ground surface. COWC determines the presence or absence of hydric soils by comparing soil samples to a Munsell soil color chart, as soil colors often reveal whether a soil is hydric or non-hydric. The standardized Munsell soil colors consist of three components: hue, value, and chroma. Soil in hydric soil areas typically show yellow-red hues, varying gray color values, and chromas of one or two. Chromas of two or less are considered low, and are often diagnostic of hydric soils. Hydric mineral soils saturated for long periods of the growing season, but unsaturated for some time, often develop mottles and/or a low chroma matrix. Soils are considered hydric if at least one primary indicator, or at least one problematic hydric soil indicator is present, as defined by the USACE.

Mineral based soils (as opposed to carbon- or organic-based soils) generally contain significant amounts of iron and manganese. As the iron component of the soil matrix comes into contact with the atmosphere, the

iron tends to oxidize giving soils a high "chroma" or rust-like color. This characteristic is typically observed in upland (i.e., non-wetlands) areas where oxygen is abundant. On the contrary, mineral soils that are saturated for extended periods (e.g., hydric soils) tend to have oxygen ions stripped, chemically reducing iron and giving these soils bluish-grayish coloring or low chroma. This reduced condition in mineral soils is known as "gleying" and is typically observed in wetlands, where soil oxygen contents are generally lower relative to upland soils. Low oxygen levels in reduced soils also tend to slow decomposition, leading to increased organic content.

The evaluation area is predominately comprised of Urban land-Celina complex soils. Wooded areas adjacent to the west of existing railroad lines are mapped with Crosby, Celina, and Kokomo soil units. Areas saturated or inundated by surface water at the time of our field reconnaissance were presumed to contain hydric soil characteristics. COWC observed hydric soil characteristics within the areas delineated as Wetland 7 and Wetland 8.

4.1.2 WETLAND HYDROLOGY CRITERIA

Wetland hydrology is determined present in areas that are periodically inundated or have soils saturated to the surface sometime during the growing season. This is a dynamic characteristic and is usually not present during drier periods of the year. Primary wetland hydrology indicators include, but are not limited to, surface water, high water table, inundation, soil saturation in the upper 12 inches of the soil, water marks, sediment deposits, drift deposits, and water-stained leaves. Secondary wetland hydrology indicators include surface soil cracks, drainage patterns, dry-season water table, crayfish burrows, saturation visible on aerial imagery, stunted or stressed plants, geomorphic position, and FAC-Neutral Test of vegetation. One primary indicator or two or more secondary indicators are required to establish a positive indication of wetland hydrology.

COWC observed primary and secondary hydrology indicators for wetlands within the areas delineated as Wetland 7 and Wetland 8.

4.1.3 HYDROPHYTIC VEGETATION CRITERIA

Hydrophytic vegetation is determined present if more than 50 percent of plant species within a plant community have an indicator status of obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC). The indicator status of plant species found in wetlands is listed in the 2018 National Wetland Plant List - Midwest Region published by the USACE[5].

COWC used this data and determined hydrophytic vegetation dominance was present within the areas delineated as Wetland 7 and Wetland 8.

[5] NWPL Home v3.4-f9c (army.mil)

4.2 JURISDICTIONAL WATERS DELINEATION FINDINGS

COWC's field reconnaissance identified two (2) wetlands (Wetland 7 and Wetland 8) totaling 0.78± acre, four (4) streams (Stream 9 through Stream 12) totaling 7,162 linear feet, and one (1) pond (Pond 1) totaling 0.23± acre within the evaluation area. The centerline of the streams and the boundary of the pond and wetlands were surveyed with a Spectra SP20 handheld GNSS receiver with sub-meter accuracy. Appendix 3 provides a map showing the location of the delineated wetlands, pond, and streams. Multi-directional photographs of each stream and wetland, and general landscape photographs are provided in Appendix 4.

Several streams delineated within the evaluation area are depicted on USGS maps as unnamed tributaries to the Scioto River, prior to development of the evaluation area as a railroad yard. Streams within the evaluation area have been placed in culverts, channelized, and relocated as part of development of the evaluation area for railroad use in the mid to late 1960s.

4.2.1 STREAMS

COWC identified four (4) streams (Stream 9 through Stream 12) totaling 7,162 linear feet within the evaluation area. These streams were delineated as Stream 9 (320± LF), Stream 10 (2,552± LF), Stream 11 (3,921± LF), and Stream 12 (369± LF). These streams are further described below:

TABLE 2
STREAM INFORMATION

Stream ID	Length (On-Site)	Classification	Start Location	End Location
Stream 9	320± LF	Intermittent	40.002356 -83.129508	40.002489 -83.128431
Stream 10	2,552± LF	Perennial	39.997258 -83.132658	40.002511 -83.128356
Stream 11	3,921± LF	Perennial	39.993333 -83.134142	39.983883 -83.130006
Stream 12	369± LF	Perennial	39.989911 -83.134697	39.990389 -83.133558
Total	**7,162± LF**			

Stream 9 (320± linear feet)

Stream 9 is a west to east flowing intermittent stream on the north part of the evaluation area. Stream 9 originates at the outfall of a round concrete culvert pipe which discharges surface water from a west adjoining stormwater management pond. This stream is littered with trash and debris. Stream 9 has a direct surface water connection with Stream 10 on the northwest part of the evaluation area. Surface water was flowing within

Stream 9 during our field reconnaissance on April 13, 2021. Substrate material within Stream 9 consists of silt, sand, and gravel.

Stream 10 (2,552± linear feet)
Stream 10 is a general southwest to northeast flowing perennial stream on the northwest part of the evaluation area. Stream 10 originates at the outfall of an oval-shaped concrete culvert pipe near the western boundary of the evaluation area. This culvert discharges surface water from the west. Surface water was flowing within Stream 10 during our field reconnaissance on April 13, 2021. Substrate material within Stream 10 consists of cobble, silt, sand, and gravel. Stream 10 is partially impounded by Pond 1.

Stream 11 (3,921± linear feet)
Stream 11 is a north to south flowing perennial stream contained within a ditch on the southwest part of the evaluation area. Surface water was flowing within Stream 11 during our field reconnaissance on April 13, 2021.

Stream 12 (369± linear feet)
Stream 12 is a west to east flowing perennial stream contained within a ditch on the southwest part of the evaluation area. Surface water was flowing within Stream 12 during our field reconnaissance on April 13, 2021. Stream 12 has a direct surface water connection to Stream 11.

4.2.1 WETLANDS

COWC identified two (2) wetlands (Wetland 7 and Wetland 8) totaling 0.78± acre within the evaluation area. These areas exhibit a dominance of hydrophytic species, primary and secondary wetland hydrology indicators, and hydric soil characteristics. These wetlands were delineated as Wetland 7 (0.49± acre) and Wetland 8 (0.29± acre). These wetlands are further described below:

TABLE 3
WETLAND INFORMATION

Wetland ID	Acreage (On-Site)	Cowardin Classification	ORAM Score	Status	Location
Wetland 7	0.49±	Palustrine Forested (PFO)	49 (Cat. 2)	Jurisdictional	39.998444 -83.130556
Wetland 8	0.29±	Palustrine Emergent (PEM)	38 (Cat. 2)	Jurisdictional	39.997300 -83.131078
Total	**0.78±**				

COWC completed Ohio Rapid Assessment Method (ORAM) score sheets for the wetland areas delineated within the evaluation area. Wetland areas

identified within the evaluation area scored within Category 2, according to Ohio EPA standards. The ORAM forms are appended.

Using the USACE OMBIL Regulatory Module (ORM) Project Upload Template, COWC determined the Cowardin classification of wetlands within the evaluation area as palustrine emergent (PEM) and palustrine forested (PFO).

Wetland 7 (0.49± acre)
Wetland 7 is located within the wooded northwest part of the evaluation area. According to the USDA web soil survey map, this wetland is located within hydric Kokomo silty clay loam soils. Wetland 7 is mapped with a PFO1A designation on the NWI map. The wetland appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Stream 10 abuts the east side of the wetland and appears to provide surface water to Wetland 7 during prolonged precipitation events. Based on visual observation, Wetland 7 appears to be regularly inundated/saturated. Wetland 7 is generally dominated by American Elm (*Ulmus americana*), Swamp White Oak (*Quercus bicolor*), and Green Ash (*Fraxinus pennsylvanica*).

Wetland 8 (0.29± acre)
Wetland 8 is located within the wooded northwest part of the evaluation area. According to the USDA web soil survey map, this wetland is located within hydric Kokomo silty clay loam soils. The wetland appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Stream 10 abuts the north side of the wetland and appears to provide surface water to Wetland 8 during prolonged precipitation events. Based on visual observation, Wetland 8 appears to be seasonally saturated. Wetland 8 is generally dominated by Reed Canary Grass (*Phalaris arundinacea*) and Black Willow (*Salix nigra).*

4.2.2 PONDS

COWC identified one (1) pond (Pond 1) totaling 0.23± acre within the evaluation area. This pond was delineated as Pond 1 (0.23± acre), and further described below:

Pond 1 (0.23± acre)
Pond 1 is located on the western part of the evaluation area. Pond 1 appears to be a heavily silted excavation that partially impounds Stream 10, which flows through the central part of Pond 1. Pond 1 may provide a limited amount of stormwater retention from areas to the west of the evaluation area, and may help reduce the flow volume of Stream 10. This pond contains no rooted or emergent vegetation. Pond 1 is mapped with a PUBG designation on the NWI map.

TABLE 4
POND INFORMATION

Pond ID	Acreage	Description	Location
Pond 1	0.23±	Impoundment	39.997153 -83.131842
Total	**0.23±**		

5.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

COWC identified two (2) wetlands (Wetland 7 and Wetland 8) totaling 0.78± acre, four (4) streams (Stream 9 through Stream 12) totaling 7,162 linear feet, and one (1) pond (Pond 1) totaling 0.23± acre within the evaluation area.

COWC followed the Navigable Waters Protection Rule (effective June 22, 2020) to determine the potential regulatory status of surface water features identified with the evaluation area. Per Title 33 (Navigation and Navigable Waters) of the Code of Federal Regulations (CFR), Chapter 2 (Corps of Engineers, Department of the Army, Department of Defense), Part 328 (Definition of Waters of the United States), Section 328.3 (Definitions), COWC has come to the following conclusions:

- Wetland 7 and Wetland 8 are likely considered waters of the U.S. per 33 CFR 328.3(a)(4), as they appear to meet the definition "adjacent wetlands" per 33 CFR 328.3(c)(1)(i)-(iv).
- Stream 9, Stream 10, Stream 11, and Stream 12 are likely considered waters of the U.S. per 33 CFR 328.3(a)(2), as they appear to meet the definition of "tributaries" per 33 CFR 328.3(c)(12).
- Pond 1 is likely considered waters of the U.S. per 33 CFR 328.3(a)(3), as Pond 1 appears to meet the definition of "lakes and ponds, and impoundments of jurisdictional waters" per 33 CFR 328.3(c)(6).

All surface water features identified within the evaluation area are likely to be regulated by the USACE. Section 404 of the CWA requires pre-construction notification (PCN) to the USACE and a Department of the Army (DA) permit prior to discharging dredged or fill material into waters of the U.S.

The USACE has authority to determine the jurisdictional status of surface water features identified within the evaluation area. Therefore, findings in this report are preliminary until verified by the USACE. COWC recommends obtaining an Approved Jurisdictional Determination (AJD) from the USACE Huntington, WV District Office for written verification of the findings documented within this report. With your authorization, COWC will supply the required information to process this request. With this reported information and/or a site visit, the USACE will make the official determination on jurisdiction. The findings and conclusions of this delineation report are subject to

change, pending USACE verification. This report will become public information upon submittal to the USACE.

6.0 SIGNATURE OF PROFESSIONAL PERSONNEL

To the best of our professional knowledge and belief, COWC personnel responsible for this report declare we have the specific qualifications based on education, training, and experience to assess the evaluation area for waters of the U.S. and isolated waters of the State of Ohio. The jurisdictional waters delineation has been conducted in a manner consistent with the criteria contained in the USACE Wetlands Delineation Manual (1987) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, and with the level of care and skill ordinarily used by similar professionals performing similar services under similar conditions in the vicinity of the evaluation area.

COWC appreciates the opportunity to serve you on this project. Please contact COWC owner Matt Kaminski at mkaminski434@gmail.com with any questions or concerns regarding this report.

Respectfully submitted,

Central Ohio Wetland Consulting, LLC

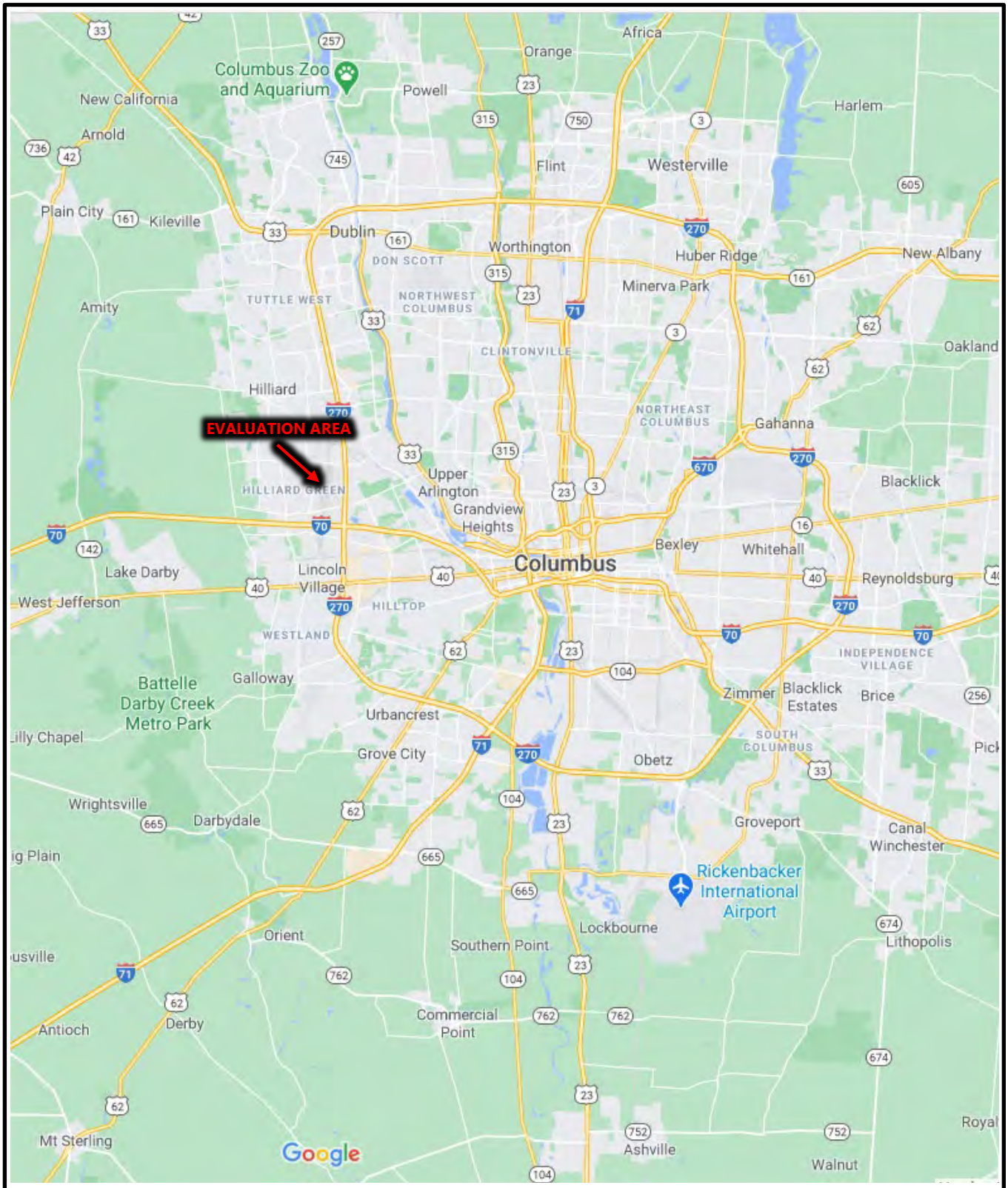
Prepared by: _____

Matthew R. Kaminski, Owner
Wetland Scientist, 401/404 Specialist

Matthew R. Kaminski holds a Bachelor of Science Degree in Environmental Geography from Ohio University with 16 years of experience as an environmental consultant. Mr. Kaminski has completed hundreds of jurisdictional waters delineations throughout the State of Ohio upon completion of the 38 Hour Army Corps of Engineers Wetland Delineation & Management Training Program in 2006. Mr. Kaminski's experience includes wetland/stream delineation, plant identification, stream evaluations, 404/401 permitting, Ohio Rapid Assessment Method v. 5.0, Clean Water Act (CWA) regulations, Sections 7 & 9 of the Endangered Species Act (ESA), and Ohio Historic Preservation Office (OHPO) Section 106. Throughout his career, Mr. Kaminski has successfully facilitated regulatory approval of numerous residential, commercial, and institutional projects. Since September 2020, Mr. Kaminski has been sole proprietor of Central Ohio Wetland Consulting, LLC, offering comprehensive wetland and stream consultation and guidance for commercial and residential developers, architects, civil design professionals, and private individuals. Professional wetland and stream consulting services include preliminary jurisdictional waters assessments, wetland/stream delineation, approved and preliminary jurisdictional determination requests, and 404/401 permitting services.

APPENDIX 1

GENERAL LOCATION MAP OF EVALUATION AREA

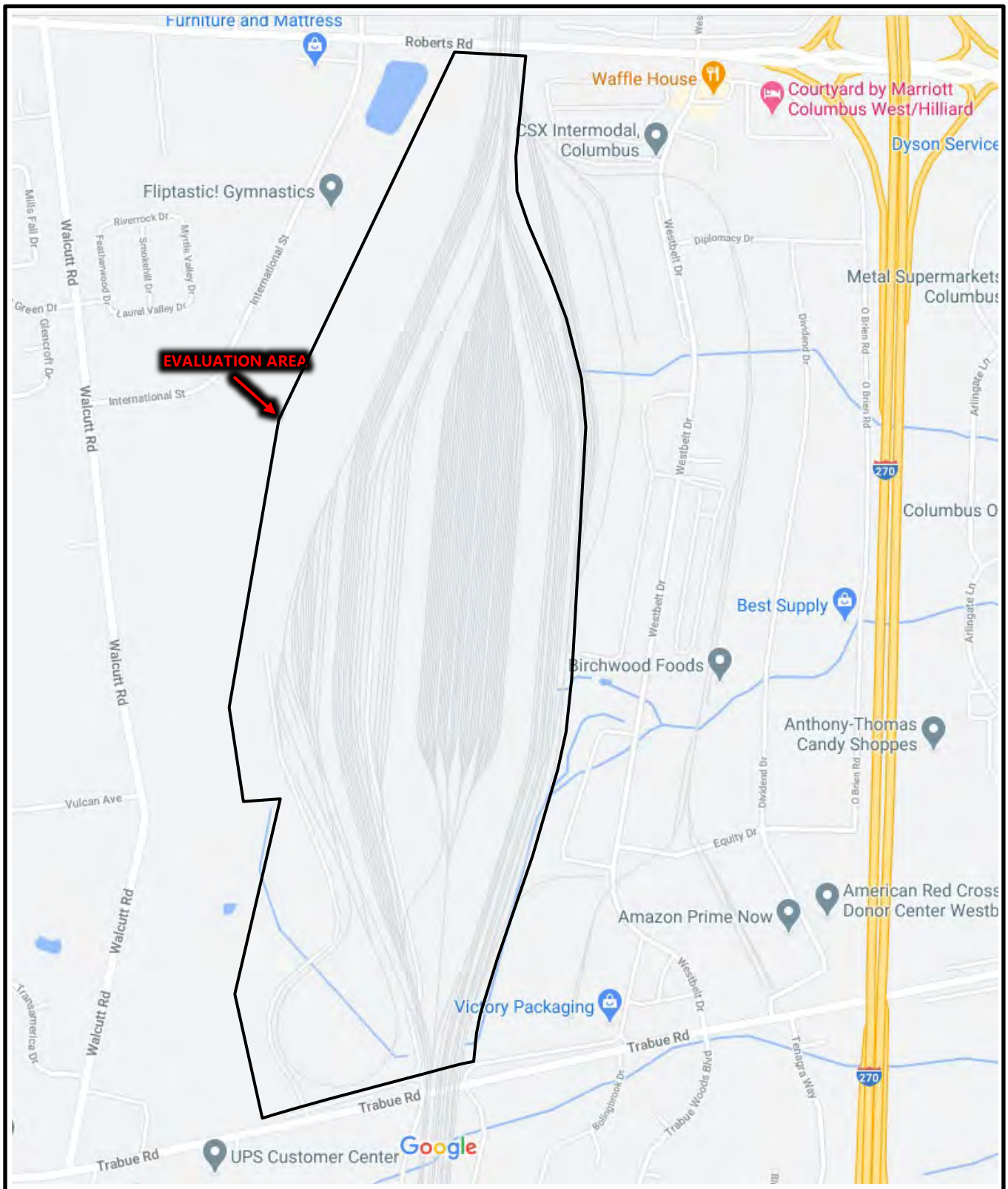


NORTH

BUCKEYE YARD
TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

CENTRAL OHIO WETLAND CONSULTING, LLC

LOCATION MAP OF EVALUATION AREA



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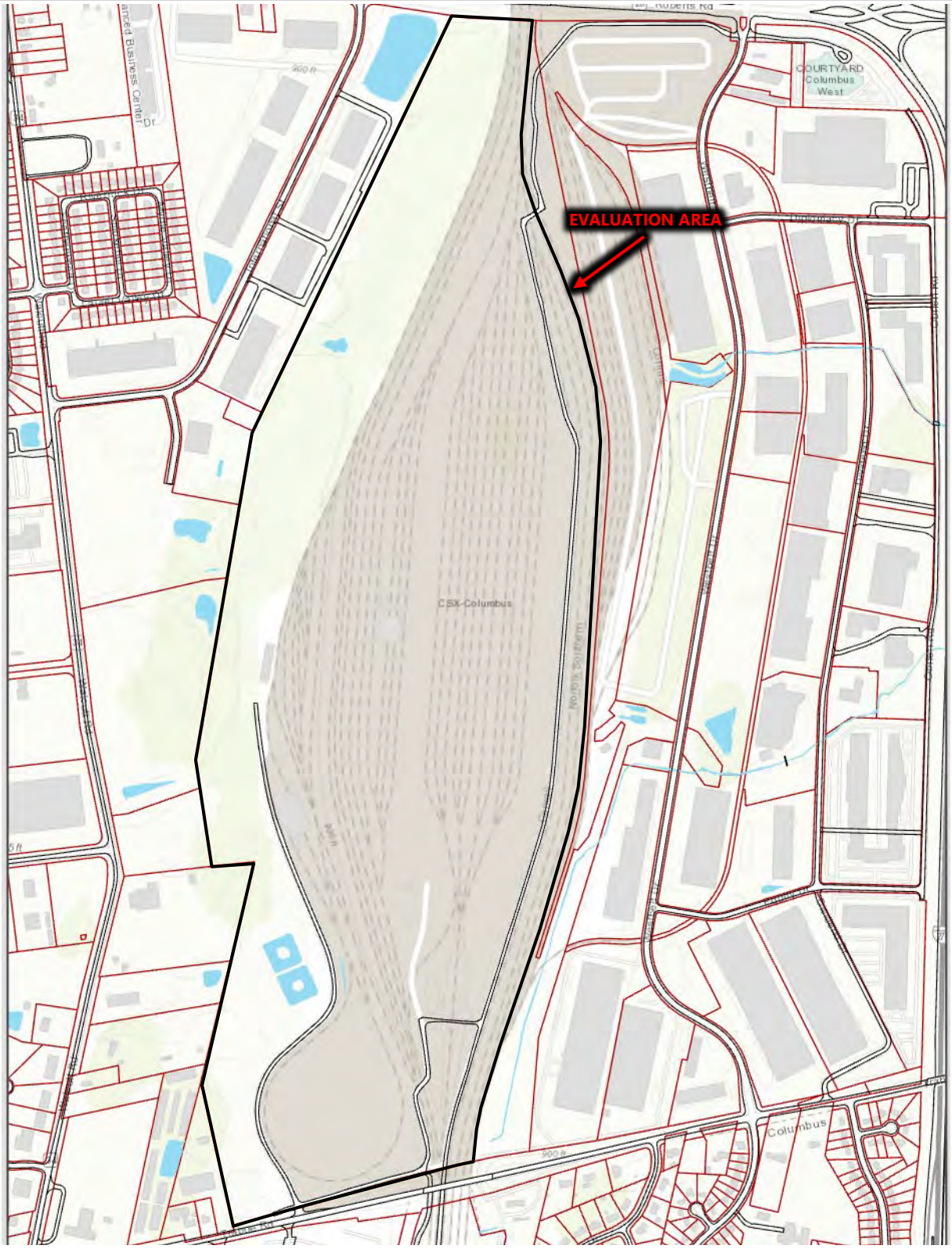
FRANKLIN COUNTY AUDITOR GIS MAP



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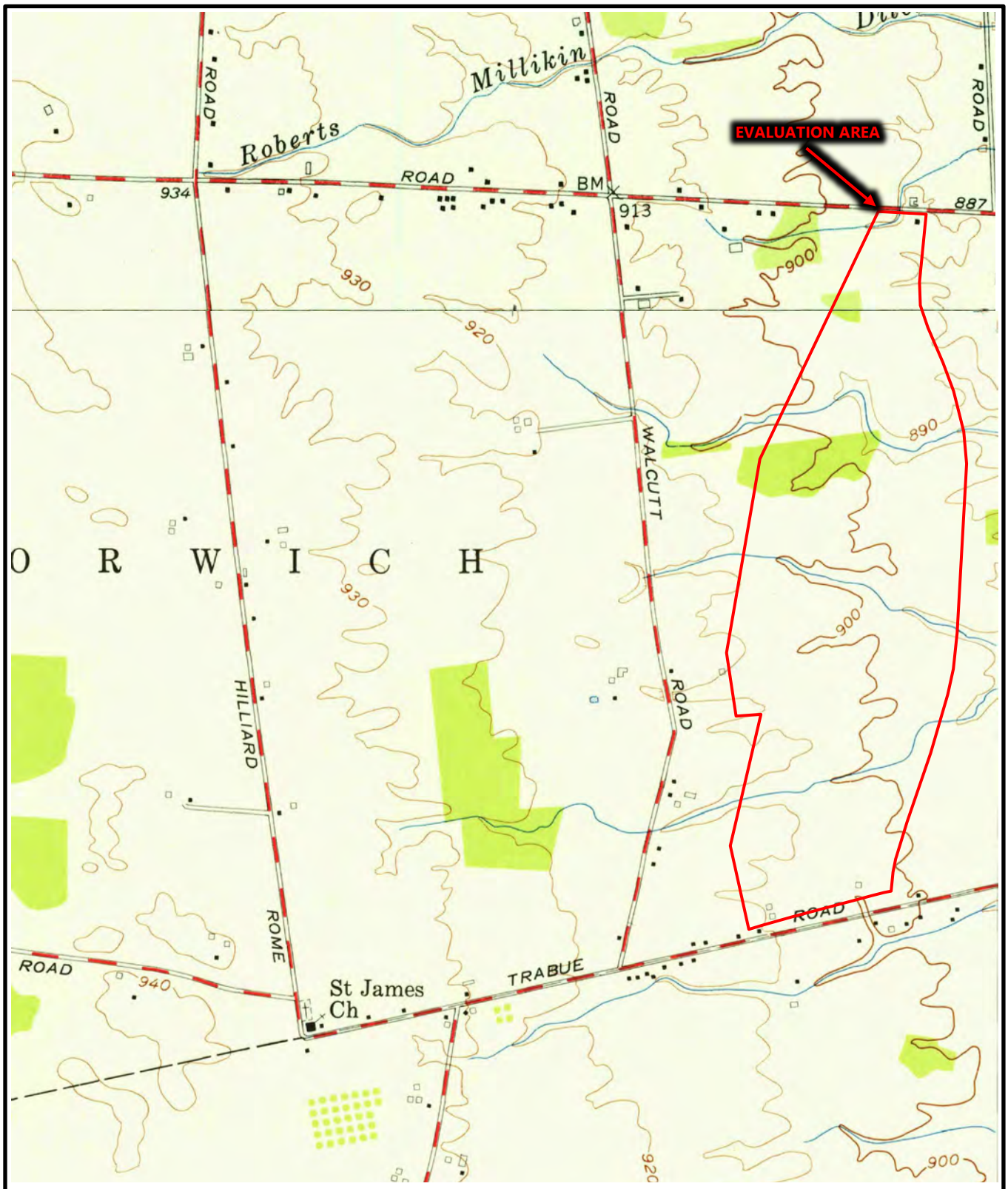
1954/1955 USGS (HILLIARD/GALLOWAY) TOPOGRAPHIC MAP



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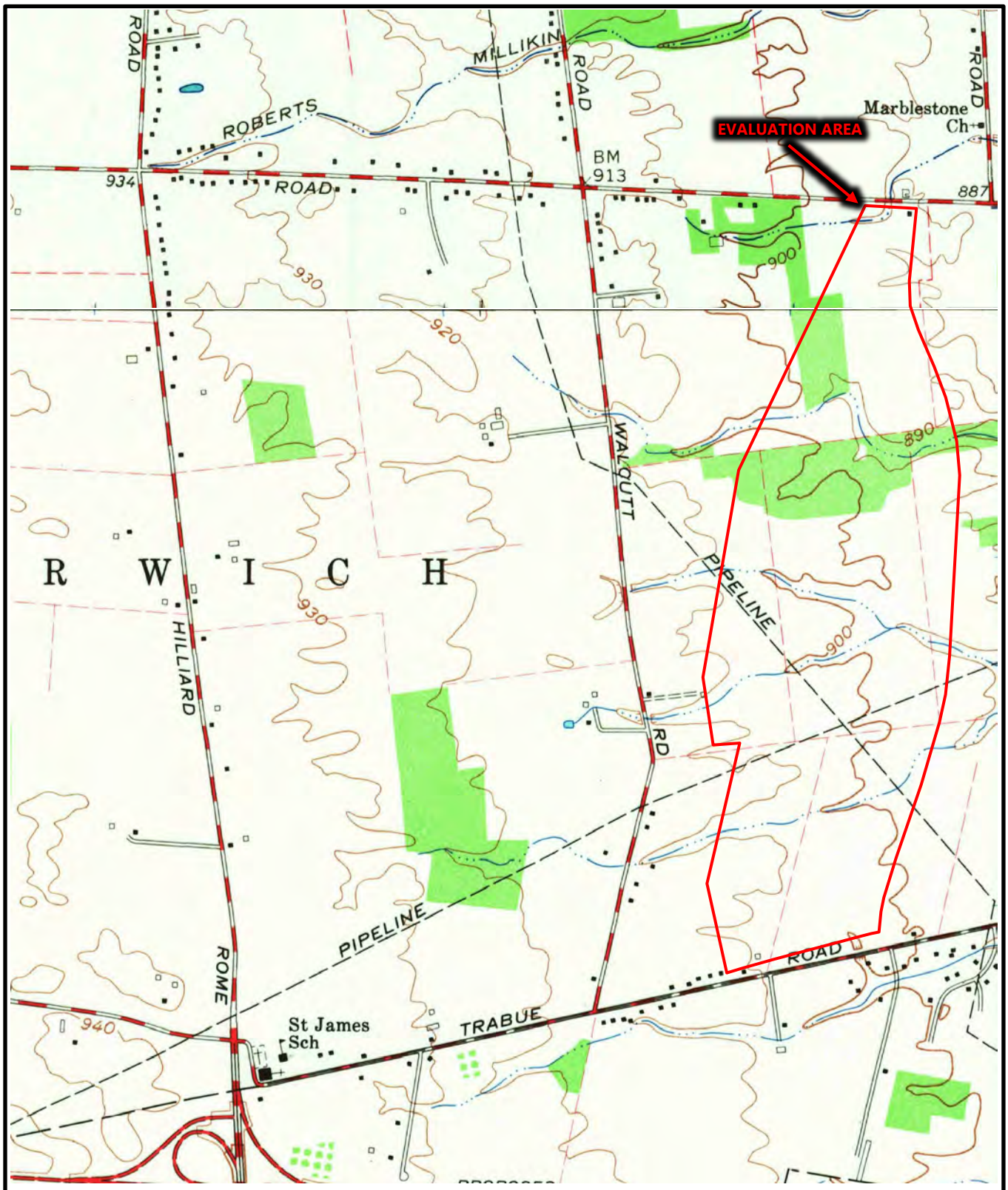
1966 USGS (HILLIARD/GALLOWAY) TOPOGRAPHIC MAP



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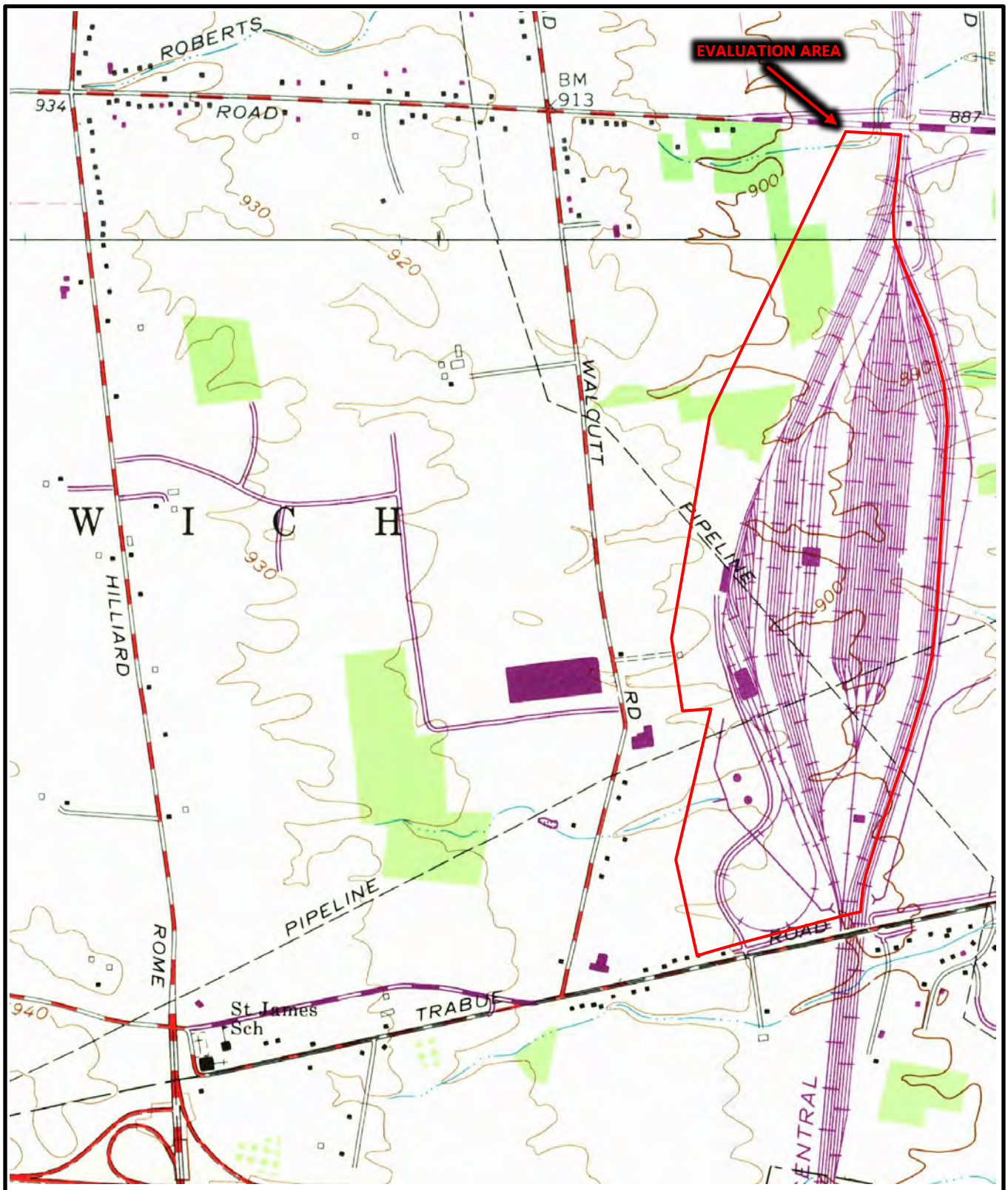
1973 USGS (HILLIARD/GALLOWAY) TOPOGRAPHIC MAP



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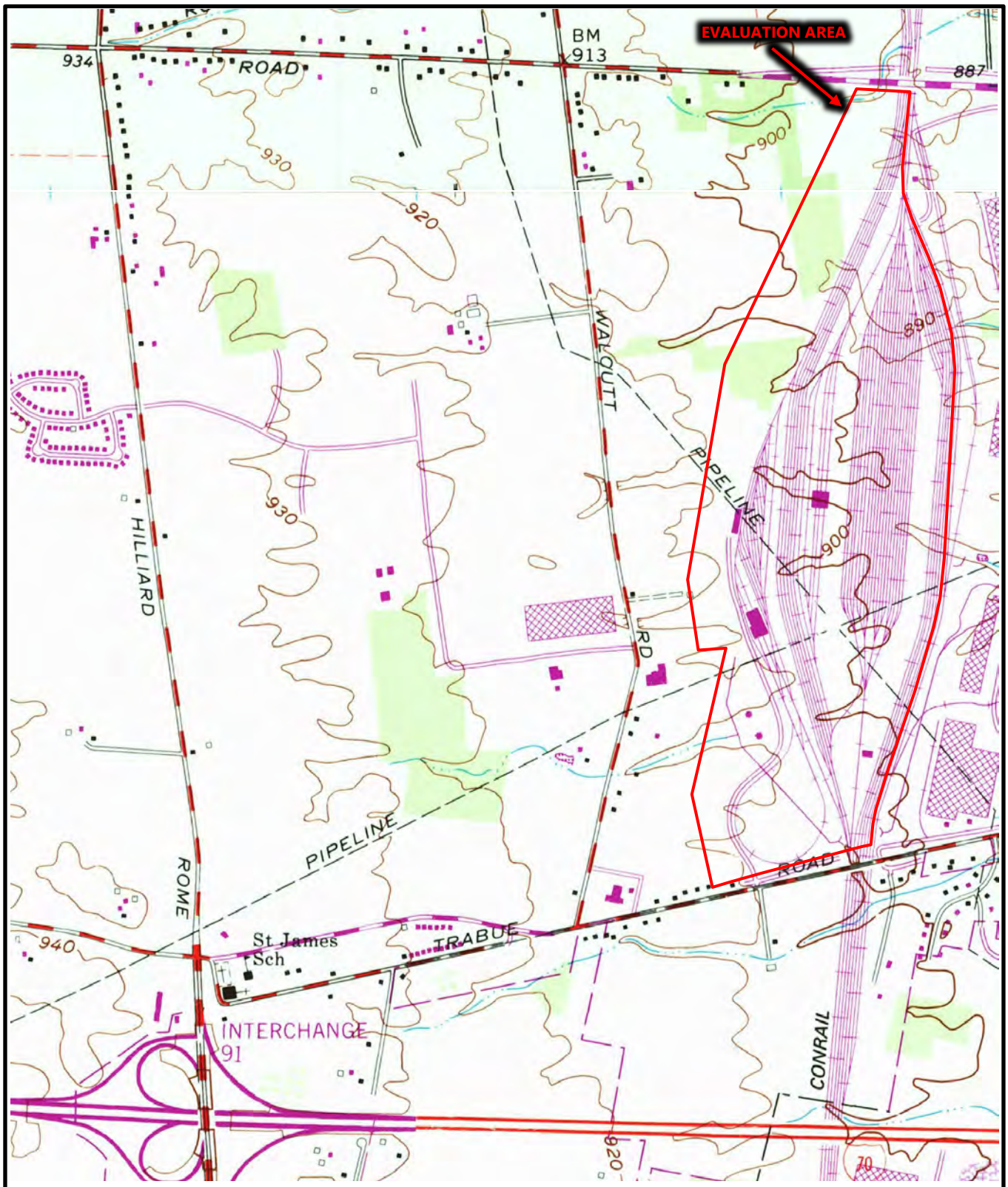
1980/1981 USGS (HILLIARD/GALLOWAY) TOPOGRAPHIC MAP



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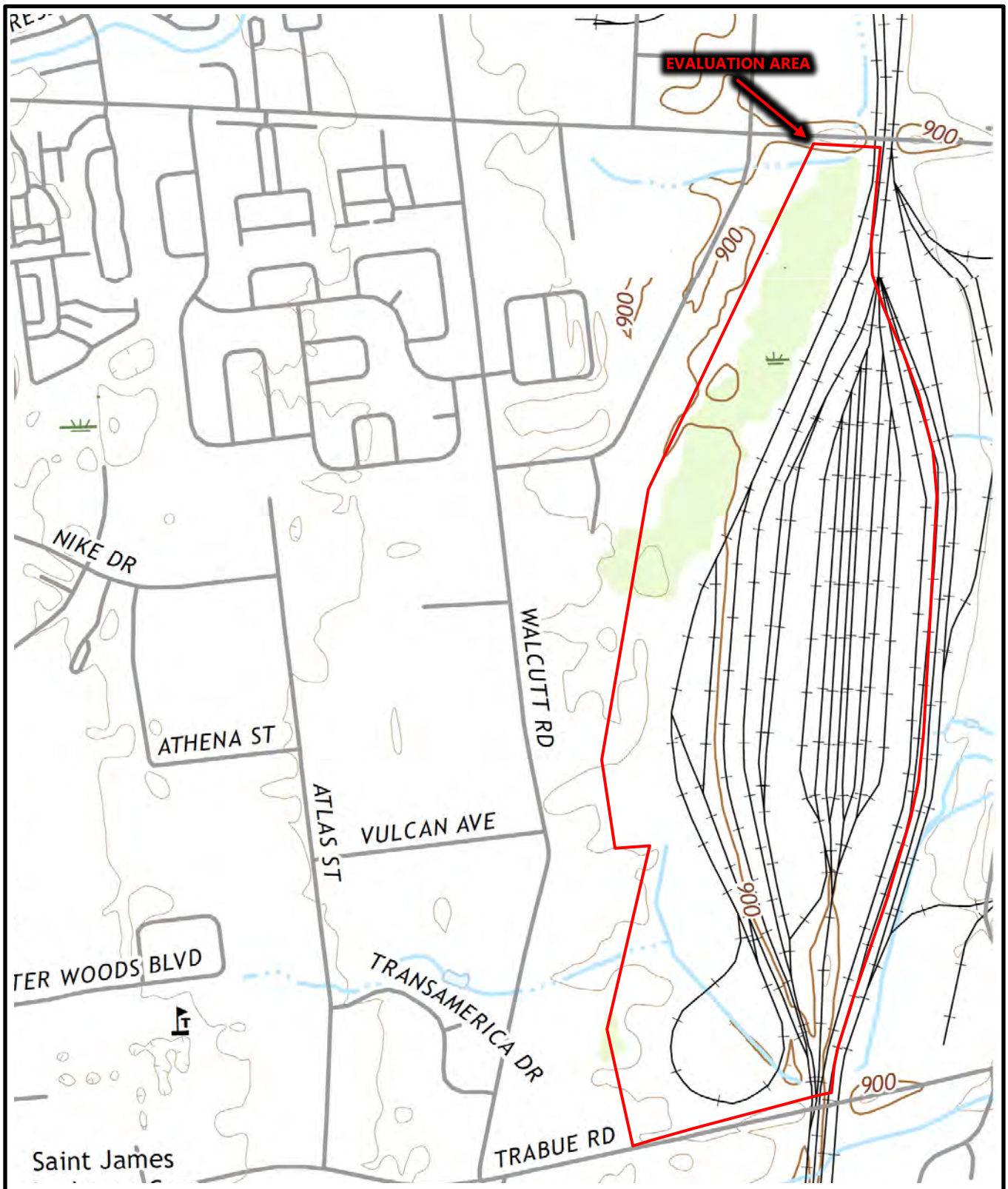
2019 USGS (HILLIARD/GALLOWAY) TOPOGRAPHIC MAP



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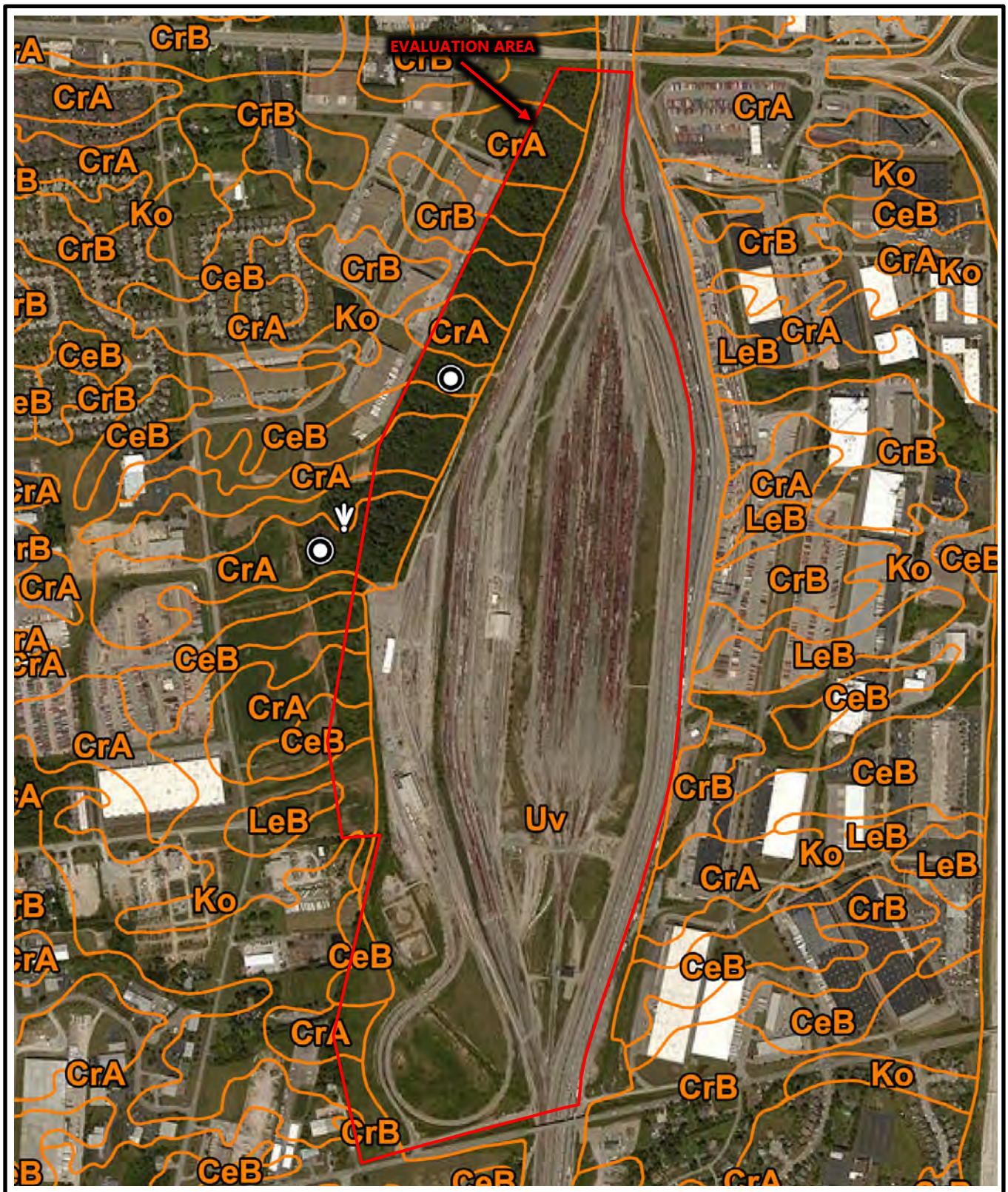
USDA WEB SOIL SURVEY MAP



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NATIONAL WETLANDS INVENTORY (NWI) MAP

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APPENDIX 2

1956 AERIAL PHOTOGRAPH

NORTH

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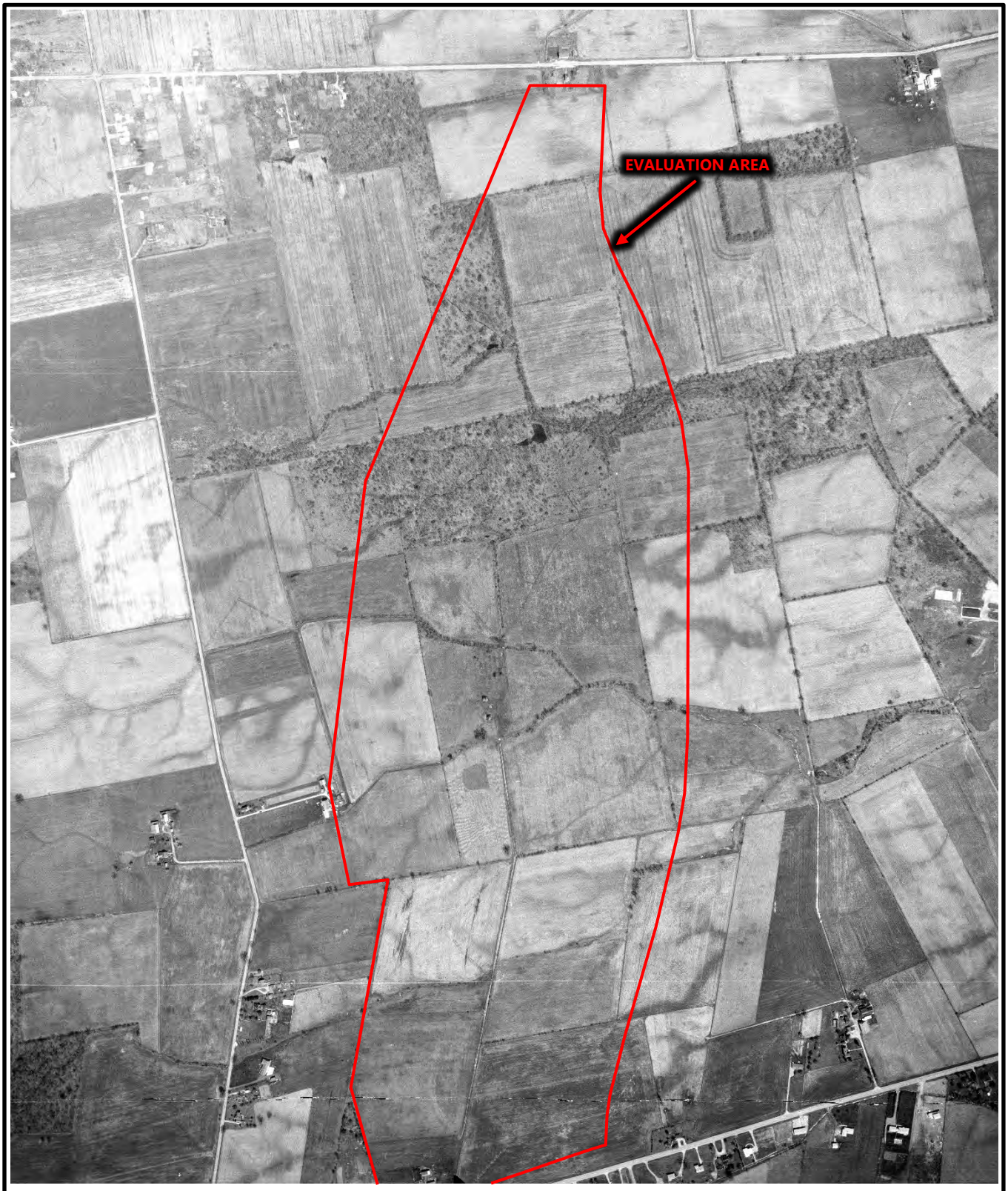
1964 AERIAL PHOTOGRAPH



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COWC PROJECT #120120007

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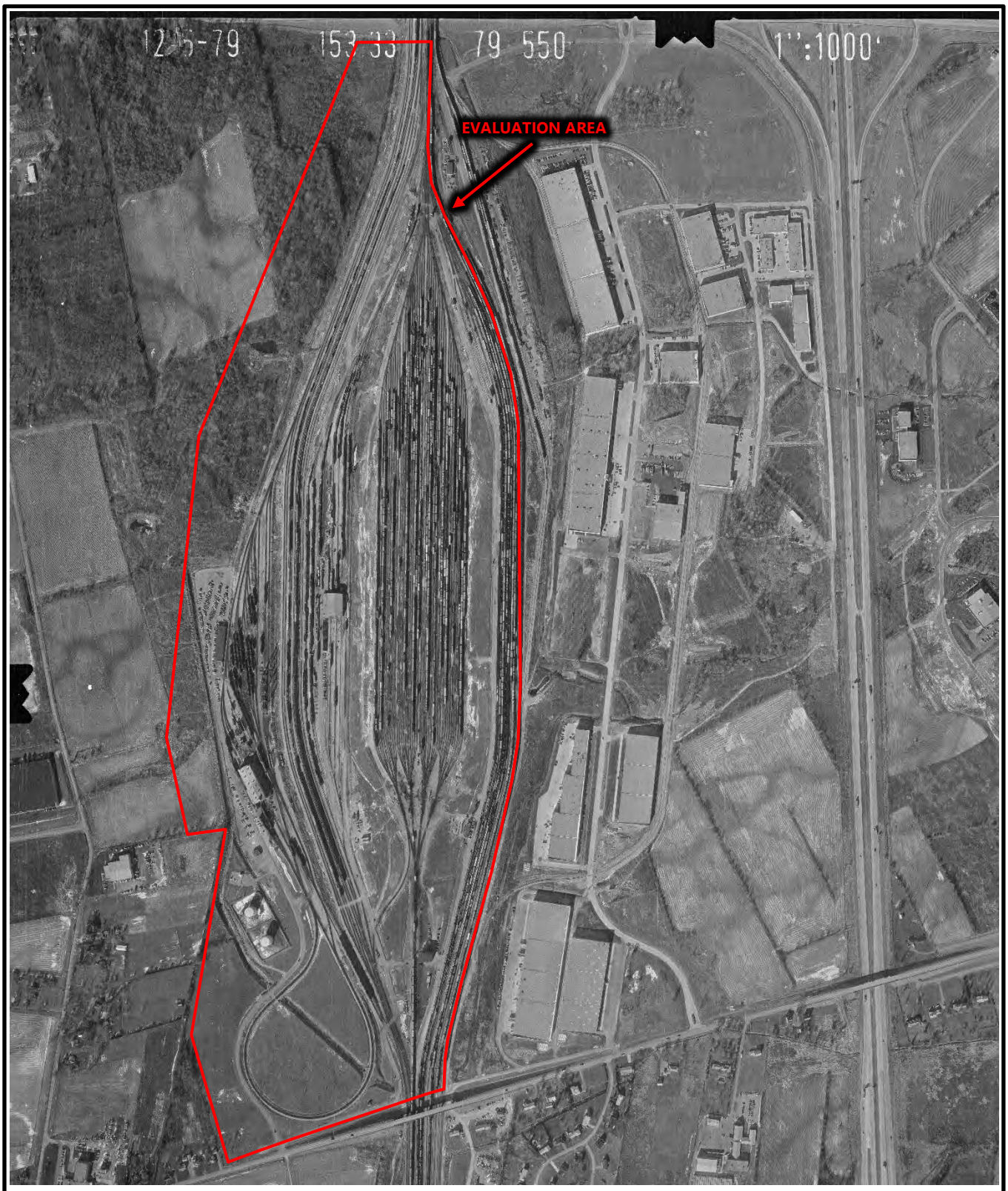
1979 AERIAL PHOTOGRAPH



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1989 AERIAL PHOTOGRAPH

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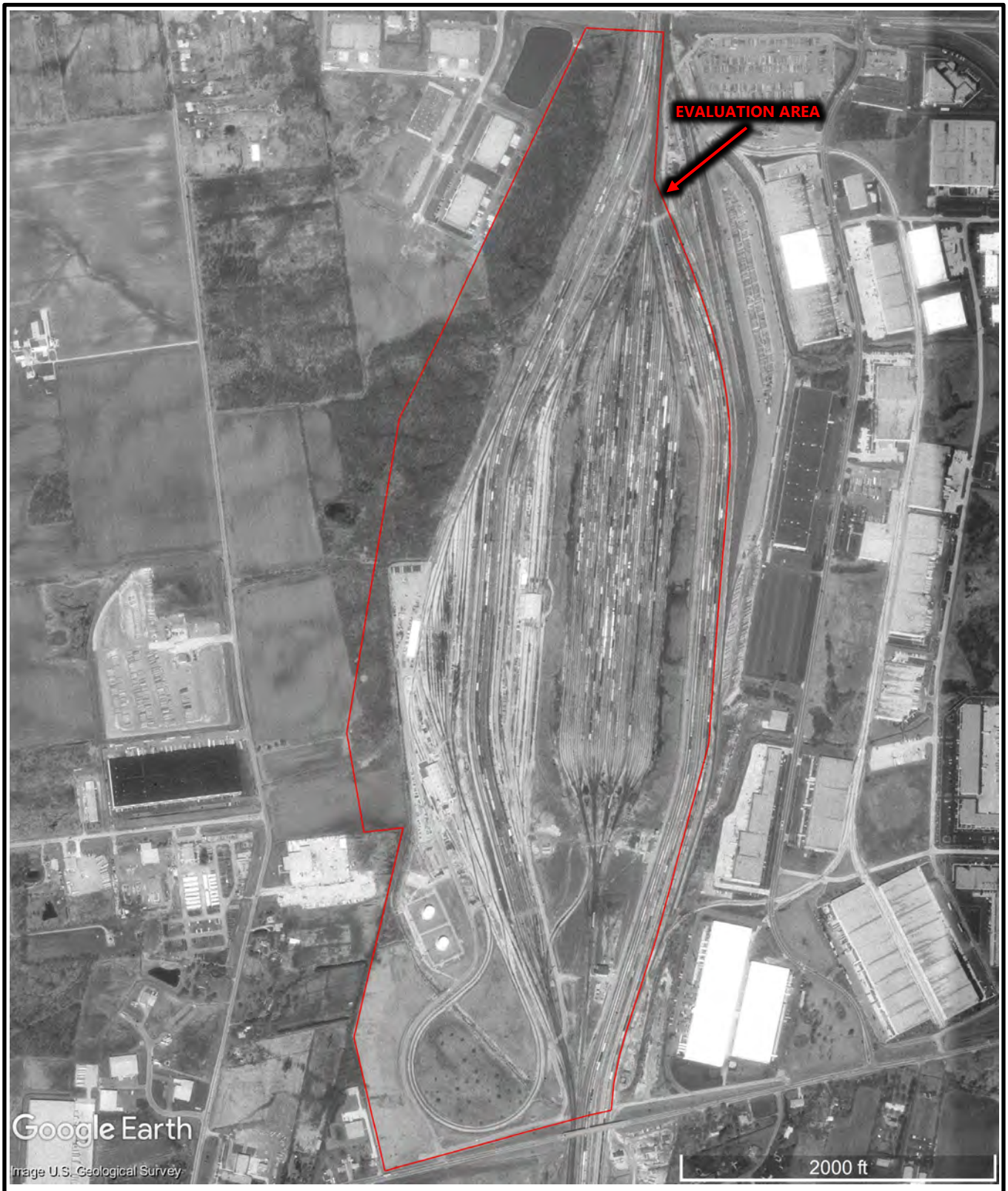
1994 AERIAL PHOTOGRAPH



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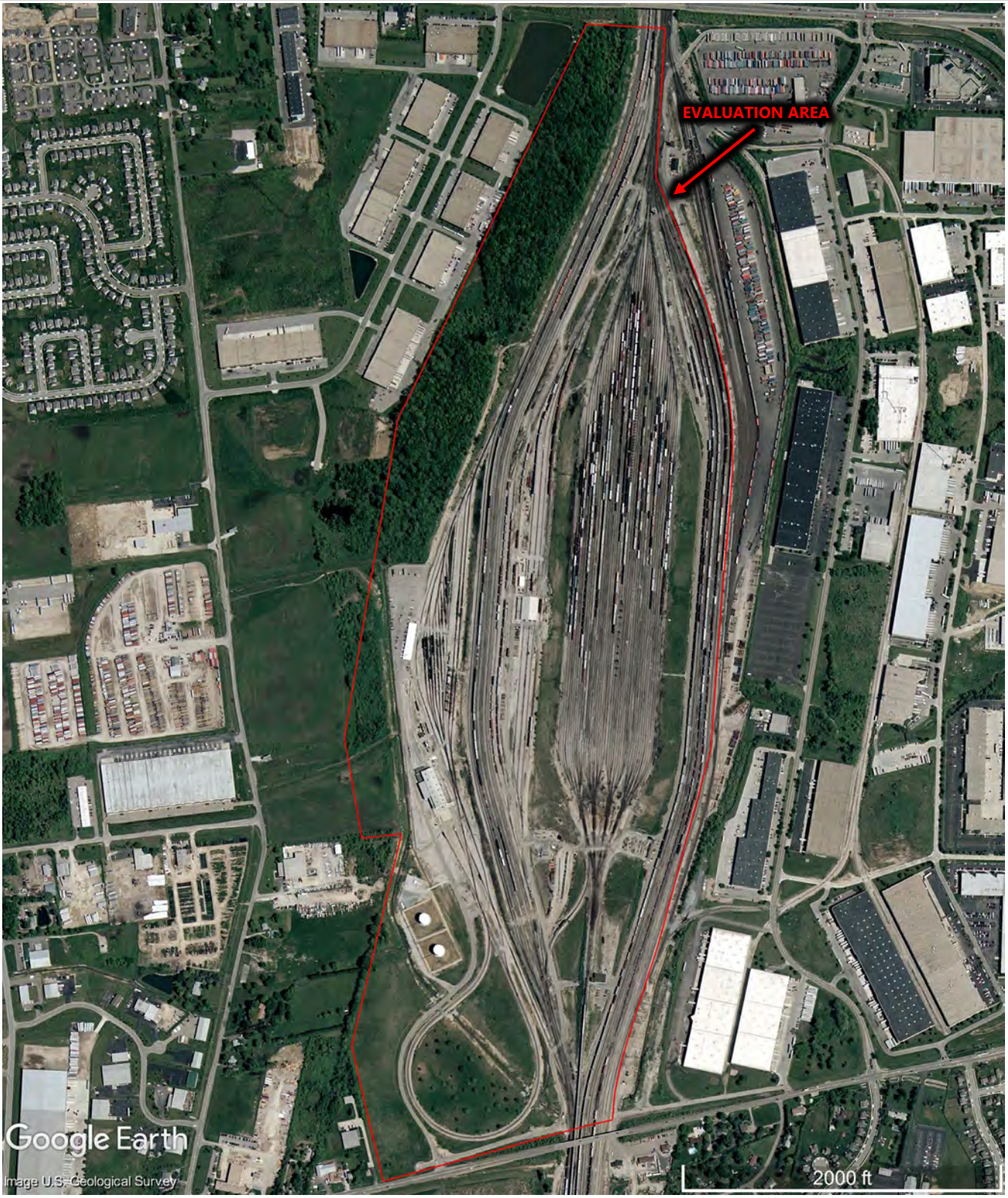
2002 AERIAL PHOTOGRAPH



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2009 AERIAL PHOTOGRAPH

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TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

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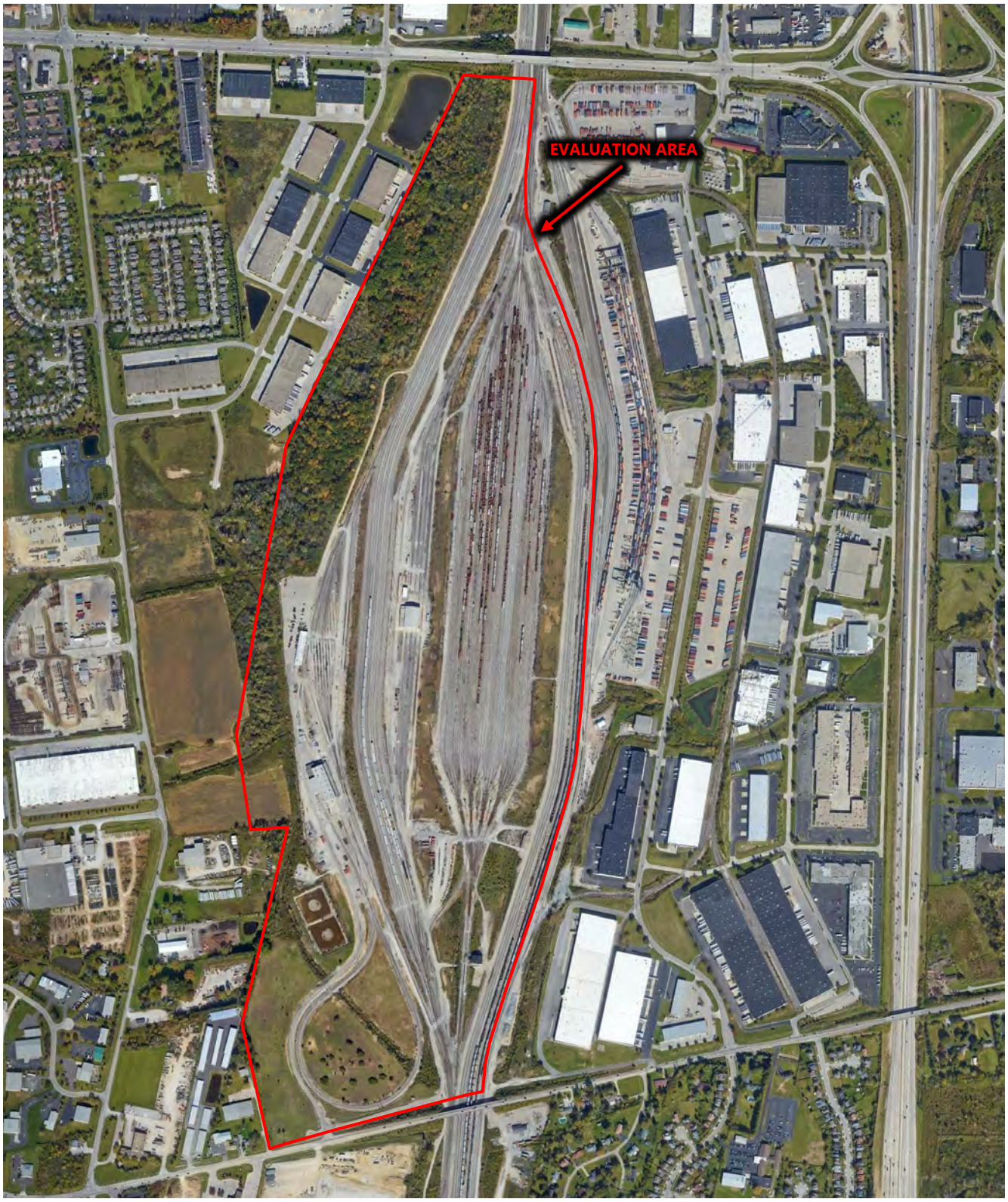
2019 AERIAL PHOTOGRAPH



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COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

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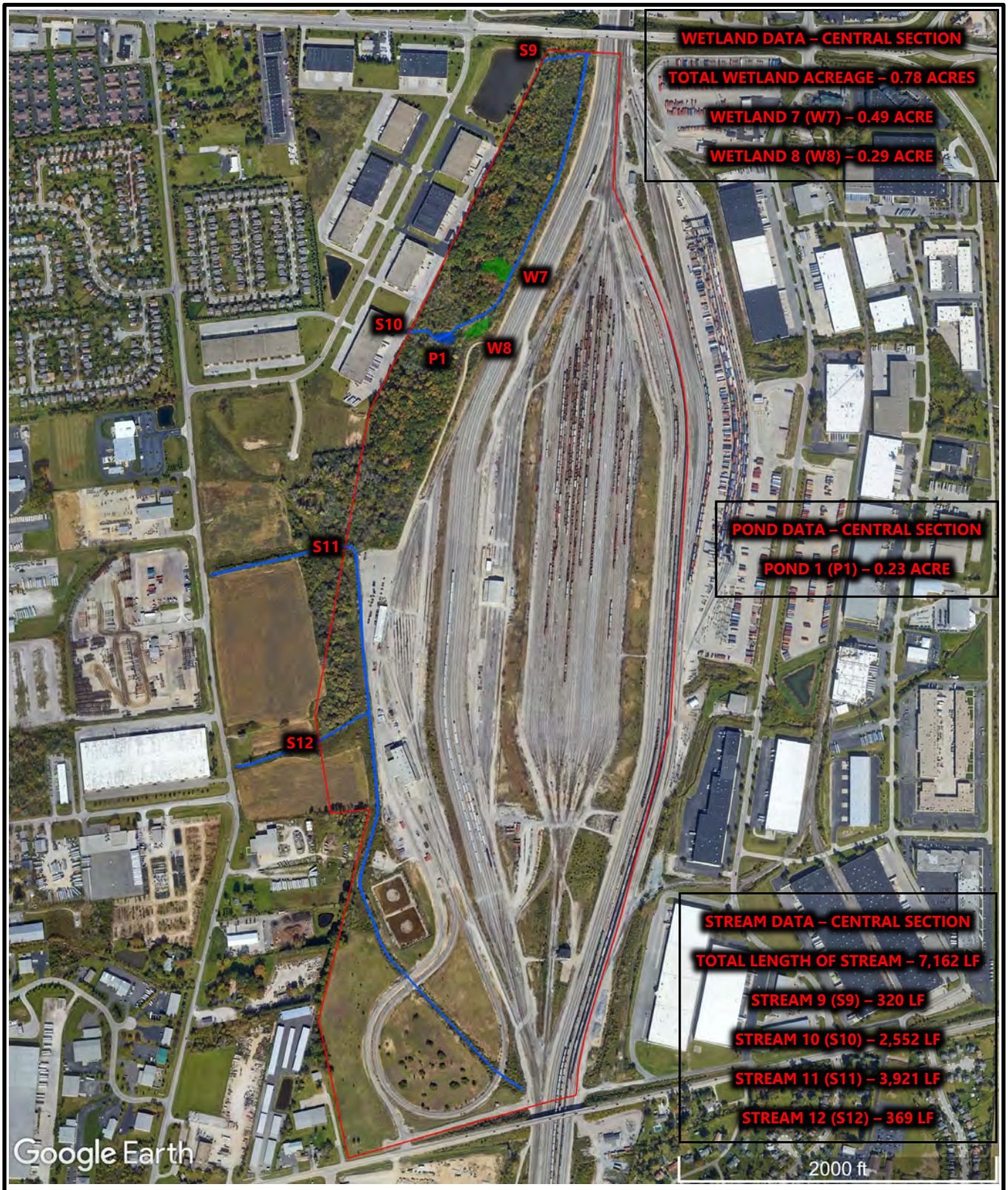
APPENDIX 3

WETLAND AND STREAM DELINEATION MAP



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COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

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WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Buckeye Yard City/County: Columbus/Franklin Sampling Date: 4/13/2021

Applicant/Owner: Kimley-Horn State: OH Sampling Point: W-7

Investigator(s): Matt Kaminski Section, Township, Range: _____

Landform (hillside, terrace, etc.): till plains Local relief (concave, convex, none): concave

Slope (%): 0-2 Lat: 39.998444 Long: -83.130556 Datum: Wetland 7

Soil Map Unit Name: Kokomo silty clay loam (Ko) NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Area delineated as Wetland 7

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	65	Yes	FACW
2. *Quercus bicolor*	20	Yes	FACW
3. *Fraxinus pennsylvanica*	10	No	FACW
4.			
5.			
	95	=Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. *Fraxinus pennsylvanica*	15	Yes	
2.			
3.			
4.			
5.			
	15	=Total Cover	

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		190 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Refer to photos 37 and 38 in COWC's delineation report.

SOIL

Sampling Point: W-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
8-16	10YR 5/2	85	10YR 5/6	15	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1
Water Table Present?	Yes X	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Buckeye Yard City/County: Columbus/Franklin Sampling Date: 4/13/2021

Applicant/Owner: Kimley-Horn State: OH Sampling Point: W-8

Investigator(s): Matt Kaminski Section, Township, Range: _____

Landform (hillside, terrace, etc.): till plains Local relief (concave, convex, none): concave

Slope (%): 0-2 Lat: 39.997300 Long: -83.131078 Datum: Wetland 8

Soil Map Unit Name: Kokomo silty clay loam (Ko) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Area delineated as Wetland 8

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	15	Yes	OBL
2.			
3.			
4.			
5.			
	15	=Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		215 (B)

Prevalence Index = B/A = 1.87

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)
Refer to photos 40 and 41 in COWC's delineation report.

SOIL

Sampling Point: W-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/2	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Buckeye Yard City/County: Columbus/Franklin Sampling Date: 4/13/2021

Applicant/Owner: Kimley-Horn State: OH Sampling Point: UP-1

Investigator(s): Matt Kaminski Section, Township, Range: _____

Landform (hillside, terrace, etc.): till plains Local relief (concave, convex, none): none

Slope (%): 0-2 Lat: 39.997969 Long: -83.130994 Datum: Upland

Soil Map Unit Name: Crosby silt loam (CrA) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Location is upland and representative of the wooded western portions of the evaluation area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	40	Yes	FACU
2. *Maclura pomifera*	20	Yes	FACU
3. *Celtis occidentalis*	15	No	FAC
4. *Ulmus americana*	10	No	FACW
5. *Fraxinus pennsylvanica*	10	No	FACW
	95	=Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. *Lonicera morrowii*	65	Yes	FACU
2.			
3.			
4.			
5.			
	65	=Total Cover	

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		=Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	15	x 3 =	45
FACU species	125	x 4 =	500
UPL species	0	x 5 =	0
Column Totals:	160 (A)		585 (B)

Prevalence Index = B/A = 3.66

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/3	95	10YR 5/6	5	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 5 cm Mucky Peat or Peat (S3)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Coast Prairie Redox (A16)
___ Iron-Manganese Masses (F12)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Gauge or Well Data (D9)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Background Information

Name:	Matt Kaminski
Date:	4/13/2021
Affiliation:	Central Ohio Wetland Consulting, LLC (COWC)
Address:	6260 Havens Road, Blacklick, Ohio 43004
Phone Number:	614-940-8771
e-mail address:	mkaminski434@gmail.com
Name of Wetland:	Wetland 7
Vegetation Communit(ies):	forested (PFO)
HGM Class(es):	depressional

Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

Wetland 7 is located approximately 1,500 feet south of Roberts Road, and approximately 670 feet east of International Street, on the northwest portion of Franklin County parcel 560-154558. The approximate coordinates for this wetland are 39.998444 / -83.130556. Refer to COWC's delineation report and wetland and stream delineation map for additional information on the location of this wetland.

Lat/Long or UTM Coordinate 39.998444 / -83.130556	
USGS Quad Name Hilliard, Ohio and Galloway, Ohio	
County Franklin	
Township Columbus	
Section and Subsection	
Hydrologic Unit Code 05060001	
Site Visit 4/13/2021	
National Wetland Inventory Map PFO1A	
Ohio Wetland Inventory Map N/A	
Soil Survey Kokomo silty clay loam (Ko)	
Delineation report/map Wetland and Stream Delineation Map	

Name of Wetland: Wetland 7

Wetland Size (acres, hectares): 0.49 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

WETLAND AND STREAM DELINEATION MAP

Comments, Narrative Discussion, Justification of Category Changes:

Wetland 7 is located within the wooded northwest part of the evaluation area. According to the USDA web soil survey map, this wetland is located within hydric Kokomo silty clay loam soils. Wetland 7 is mapped with a PFO1A designation on the NWI map. The wetland appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Stream 10 abuts the east side of the wetland and appears to provide surface water to Wetland 7 during prolonged precipitation events. Based on visual observation, Wetland 7 appears to be regularly inundated/saturated. Wetland 7 is generally dominated by American Elm (Ulmus americana), Swamp White Oak (Quercus bicolor), and Green Ash (Fraxinus pennsylvanica). The wetland scored 49 points, placing this wetland in Category 2.

Final score : 49 **Category:** 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland*. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

Wetland 7

Site: Buckeye Yard	**Rater(s):** Matt Kaminski	**Date:** 4/13/2021

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [x] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

7	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

17	26
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [x] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [x] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

17	43
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [x] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

43
subtotal this page

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Wetland 7

Site: Buckeye Yard	Rater(s): Matt Kaminski	Date: 4/13/2021

43
subtotal first page

0	43
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

6	49
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [1] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [✓] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [✓] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [1] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

49

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 7

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	17	
	Metric 4. Habitat	17	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	6	
	TOTAL SCORE	49	Category based on score breakpoints Category 2

Complete Wetland Categorization Worksheet.

Wetland 7

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Matt Kaminski
Date:	4/13/2021
Affiliation:	Central Ohio Wetland Consulting, LLC (COWC)
Address:	6260 Havens Road, Blacklick, Ohio 43004
Phone Number:	614-940-8771
e-mail address:	mkaminski434@gmail.com
Name of Wetland:	Wetland 8
Vegetation Communit(ies):	emergent (PEM)
HGM Class(es):	depressional

Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.

Wetland 8 is located approximately 1,900 feet south of Roberts Road, and approximately 800 feet east of International Street, on the northwest portion of Franklin County parcel 560-154558. The approximate coordinates for this wetland are 39.997300 / -83.131078. Refer to COWC's delineation report and wetland and stream delineation map for additional information on the location of this wetland.

Lat/Long or UTM Coordinate 39.997300 / -83.131078	
USGS Quad Name Hilliard, Ohio and Galloway, Ohio	
County Franklin	
Township Columbus	
Section and Subsection	
Hydrologic Unit Code 05060001	
Site Visit 4/13/2021	
National Wetland Inventory Map N/A	
Ohio Wetland Inventory Map N/A	
Soil Survey Kokomo silty clay loam (Ko)	
Delineation report/map Wetland and Stream Delineation Map	

Name of Wetland: Wetland 8

Wetland Size (acres, hectares): 0.29 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.

WETLAND AND STREAM DELINEATION MAP

Comments, Narrative Discussion, Justification of Category Changes:

Wetland 8 is located within the wooded northwest part of the evaluation area. According to the USDA web soil survey map, this wetland is located within hydric Kokomo silty clay loam soils. The wetland appears to receive hydrology from precipitation, overland flow from adjacent uplands, and flood waters from Stream 10. Stream 10 abuts the north side of the wetland and appears to provide surface water to Wetland 8 during prolonged precipitation events. Based on visual observation, Wetland 8 appears to be seasonally saturated. Wetland 8 is generally dominated by Reed Canary Grass (Phalaris arundinacea) and Black Willow (Salix nigra). The wetland scored 38 points, placing this wetland in Category 2.

Final score : 38 **Category:** 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland*. In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.	✓	
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), http://www.dnr.state.oh.us/dnap . The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	**Critical Habitat.** Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	**Threatened or Endangered Species.** Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	**Documented High Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	**Category 1 Wetlands.** Is the wetland less than 0.5 hectares (1 acre) in size and **hydrologically isolated** and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by *Phalaris arundinacea, Lythrum salicaria,* or *Phragmites australis*, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	**Bogs.** Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly *Sphagnum* spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	**Fens.** Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	**"Old Growth Forest."** Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	**Mature forested wetlands**. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands**. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings)** Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	**Relict Wet Prairies**. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	0ak Opening species	wet prairie species
Lythrum salicaria	*Zygadenus elegans var. glaucus*	*Calla palustris*	*Carex cryptolepis*	*Calamagrostis canadensis*
Myriophyllum spicatum	*Cacalia plantaginea*	*Carex atlantica var. capillacea*	*Carex lasiocarpa*	*Calamogrostis stricta*
Najas minor	*Carex flava*	*Carex echinata*	*Carex stricta*	*Carex atherodes*
Phalaris arundinacea	*Carex sterilis*	*Carex oligosperma*	*Cladium mariscoides*	*Carex buxbaumii*
Phragmites australis	*Carex stricta*	*Carex trisperma*	*Calamagrostis stricta*	*Carex pellita*
Potamogeton crispus	*Deschampsia caespitosa*	*Chamaedaphne calyculata*	*Calamagrostis canadensis*	*Carex sartwellii*
Ranunculus ficaria	*Eleocharis rostellata*	*Decodon verticillatus*	*Quercus palustris*	*Gentiana andrewsii*
Rhamnus frangula	*Eriophorum viridicarinatum*	*Eriophorum virginicum*		*Helianthus grosseserratus*
Typha angustifolia	*Gentianopsis spp.*	*Larix laricina*		*Liatris spicata*
Typha xglauca	*Lobelia kalmii*	*Nemopanthus mucronatus*		*Lysimachia quadriflora*
	Parnassia glauca	*Schechzeria palustris*		*Lythrum alatum*
	Potentilla fruticosa	*Sphagnum spp.*		*Pycnanthemum virginianum*
	Rhamnus alnifolia	*Vaccinium macrocarpon*		*Silphium terebinthinaceum*
	Rhynchospora capillacea	*Vaccinium corymbosum*		*Sorghastrum nutans*
	Salix candida	*Vaccinium oxycoccos*		*Spartina pectinata*
	Salix myricoides	*Woodwardia virginica*		*Solidago riddellii*
	Salix serissima	*Xyris difformis*		
	Solidago ohioensis			
	Tofieldia glutinosa			
	Triglochin maritimum			
	Triglochin palustre			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland 8

Site: Buckeye Yard	**Rater(s):** Matt Kaminski	**Date:** 4/13/2021

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- [x] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

7	8
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15	23
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] Precipitation (1)
- [x] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [x] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [x] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

15	38
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

38
subtotal this page

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Wetland 8

Site: Buckeye Yard	Rater(s): Matt Kaminski	Date: 4/13/2021

38
subtotal first page

0	38
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0	38
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [✓] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [✓] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummucks/tussucks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

38

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 8

		circle answer or insert score	Result
Narrative Rating	Question 1 Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1	
	Metric 2. Buffers and surrounding land use	7	
	Metric 3. Hydrology	15	
	Metric 4. Habitat	15	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	0	
	TOTAL SCORE	38	Category based on score breakpoints Category 2

Complete Wetland Categorization Worksheet.

Wetland 8

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score *less* than the Category 2 scoring threshold (*excluding* gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score *greater* than the Category 2 scoring threshold *(including* any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the *"gray zone"* for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit *moderate OR superior* hydrologic OR habitat, OR recreational functions AND the wetland was *not* categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

APPENDIX 4

PHOTO KEY

NORTH

BUCKEYE YARD
TRABUE AND ROBERTS ROADS
COLUMBUS, FRANKLIN COUNTY, OHIO
COWC PROJECT #120120007

CENTRAL OHIO WETLAND CONSULTING, LLC

Photo 21 – Southerly view of former railroad lines observed throughout the evaluation area.

Photo 22 – Northeasterly view of former railroad lines and waste areas between tracks on the central part of the evaluation area.

Photo 23 – Northerly view of former railroad lines on the southern part of the evaluation area.

Photo 24 – Southerly view of former railroad lines and brushy land on the southwest part of the evaluation area.

Photo 25 – Southerly view along a cleared utility corridor on the west central part of the evaluation area.

Photo 26 – Typical view of dense vegetation comprising the wooded western portions of the evaluation area.

Photo 27 – Typical view of dense vegetation comprising the wooded western portions of the evaluation area.

Photo 28 – Westerly view along Stream 9 on the northwest part of the evaluation area.

Photo 29 – Westerly view at the origination of Stream 9. This culvert pipe discharges surface water from a west adjoining storm water management pond.

Photo 30 – Southwesterly view at the west adjoining storm water management pond directing surface water to Stream 9.

Photo 31 – Westerly view at the beginning of Stream 10 on the northwest part of the evaluation area.

Photo 32 – Northeasterly view across Pond 1 on northwest part of the evaluation area. This pond impounds Stream 10.

Photo 33 – Southwesterly view across Pond 1 on northwest part of the evaluation area. This pond impounds Stream 10.

Photo 34 – Southerly (upstream) view along Stream 10 on northwest part of the evaluation area.

Photo 35 – Northerly (downstream) view along Stream 10 on northwest of the evaluation area.

Photo 36 – Northeasterly view of the confluence of Stream 9 with Stream 10 on the northwest part of the evaluation area.

Photo 37 – Southerly view of Wetland 7 on the northwest part of the evaluation area.

Photo 38 – Easterly view of Wetland 7 on the northwest part of the evaluation area.

Photo 39 – Typical view of wooded areas to the north, south, and west of Wetland 7 on the northwest part of the evaluation area.

Photo 40 – Southwesterly view of Wetland 8 on the northwest part of the evaluation area.

Photo 41 – Northeasterly view of Wetland 8 on the northwest part of the evaluation area.

Photo 42 – Easterly view of Stream 11 as it enters the west central part of the evaluation area from the west.

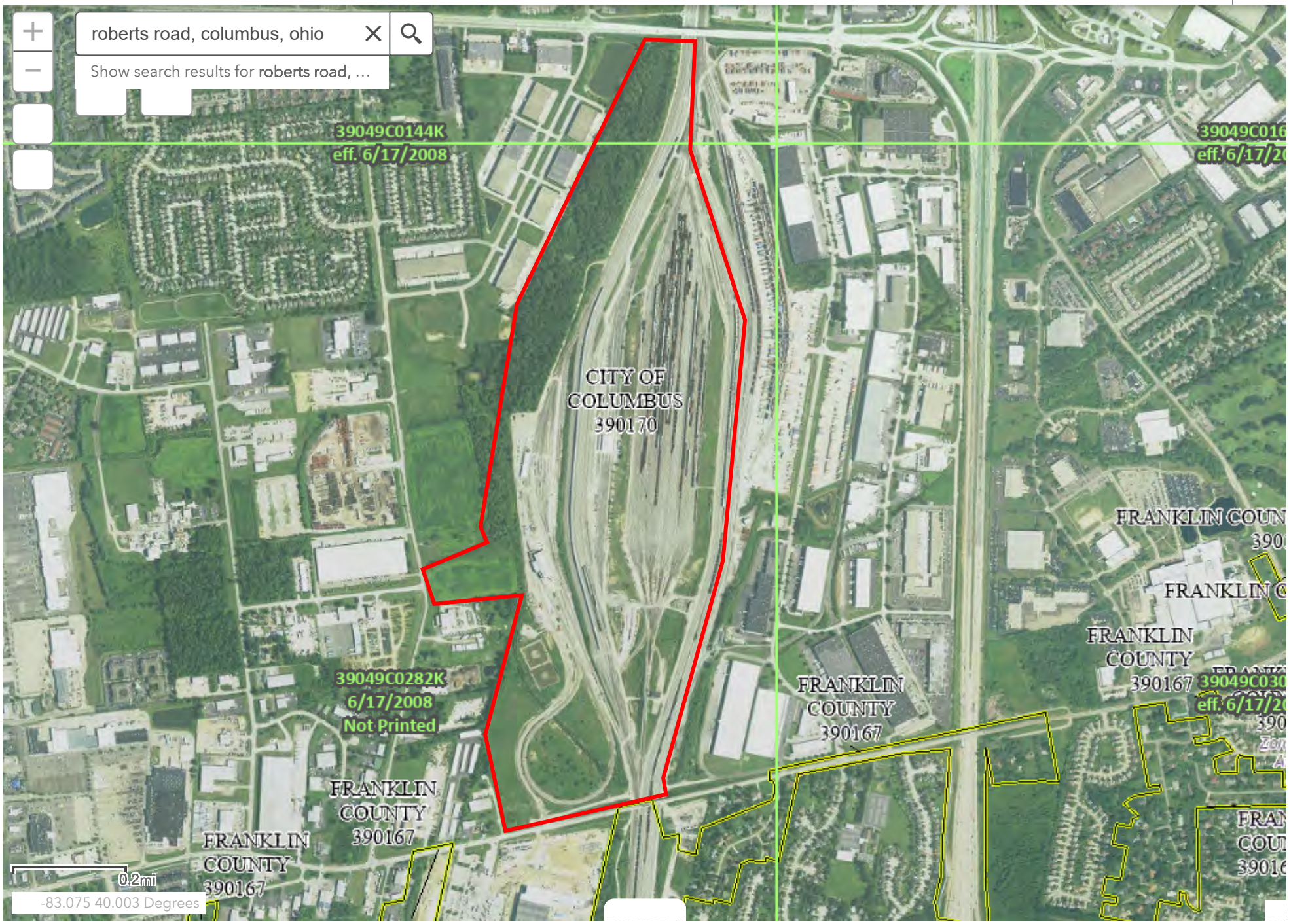
Photo 43 – Northwesterly view of Stream 11 on the west central part of the evaluation area.

Photo 44 – Southeasterly view of Stream 11 as it crosses the southwest part of the evaluation area.

Appendix N: Additional Supporting Documentation (Historical Aerials, FEMA Map, HUC Map, etc.)

FEMA's National Flood Hazard Layer (NFHL) Viewer

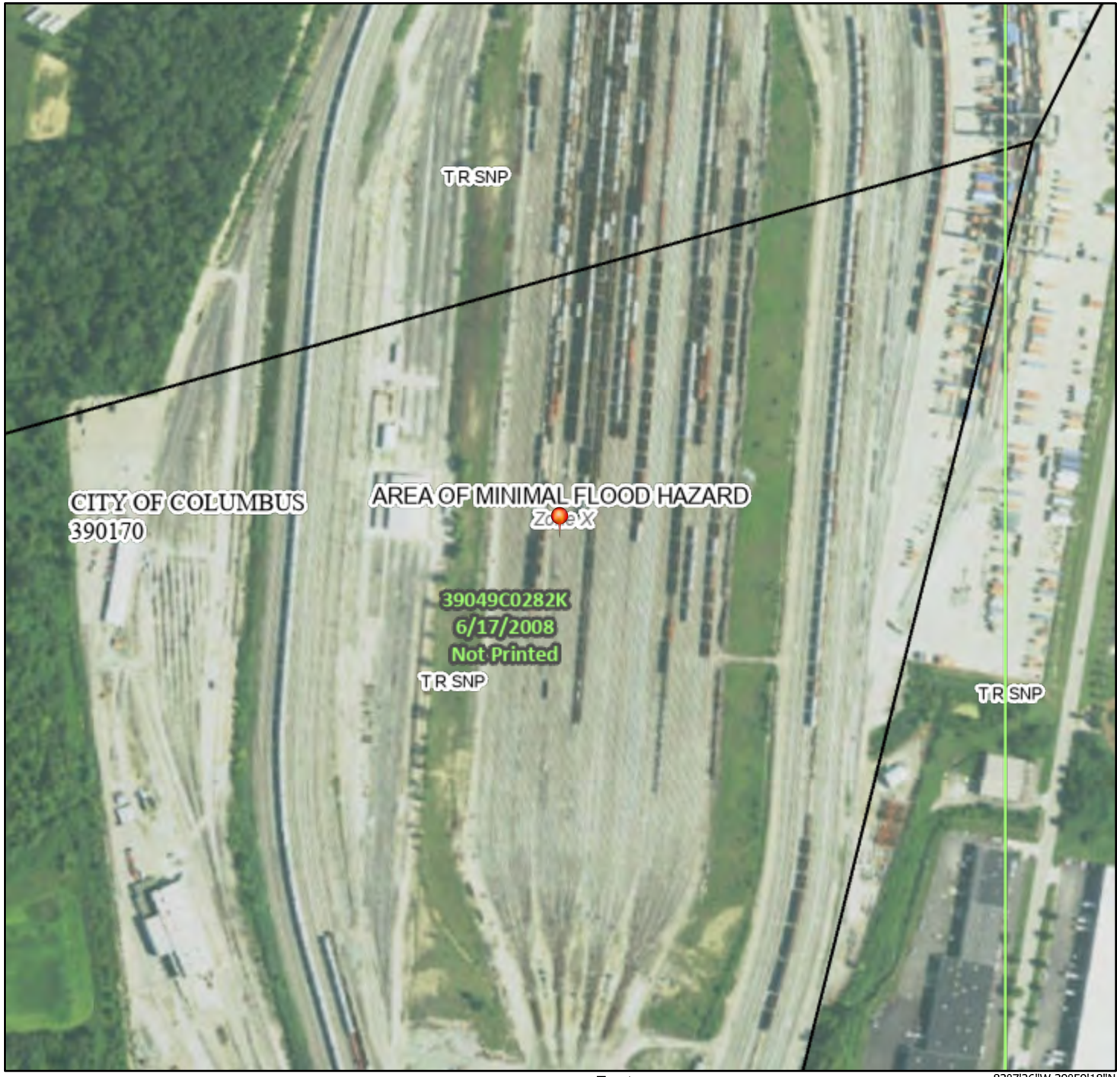
with Web AppBuilder for ArcGIS



National Flood Hazard Layer FIRMette

FEMA

83°8'4"W 39°59'46"N



83°7'26"W 39°59'18"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/16/2021 at 11:29 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Ohio EPA HUC Map - Site Location

2/4/2022, 10:33:58 AM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

Watershed Assessment Units (HUC12)

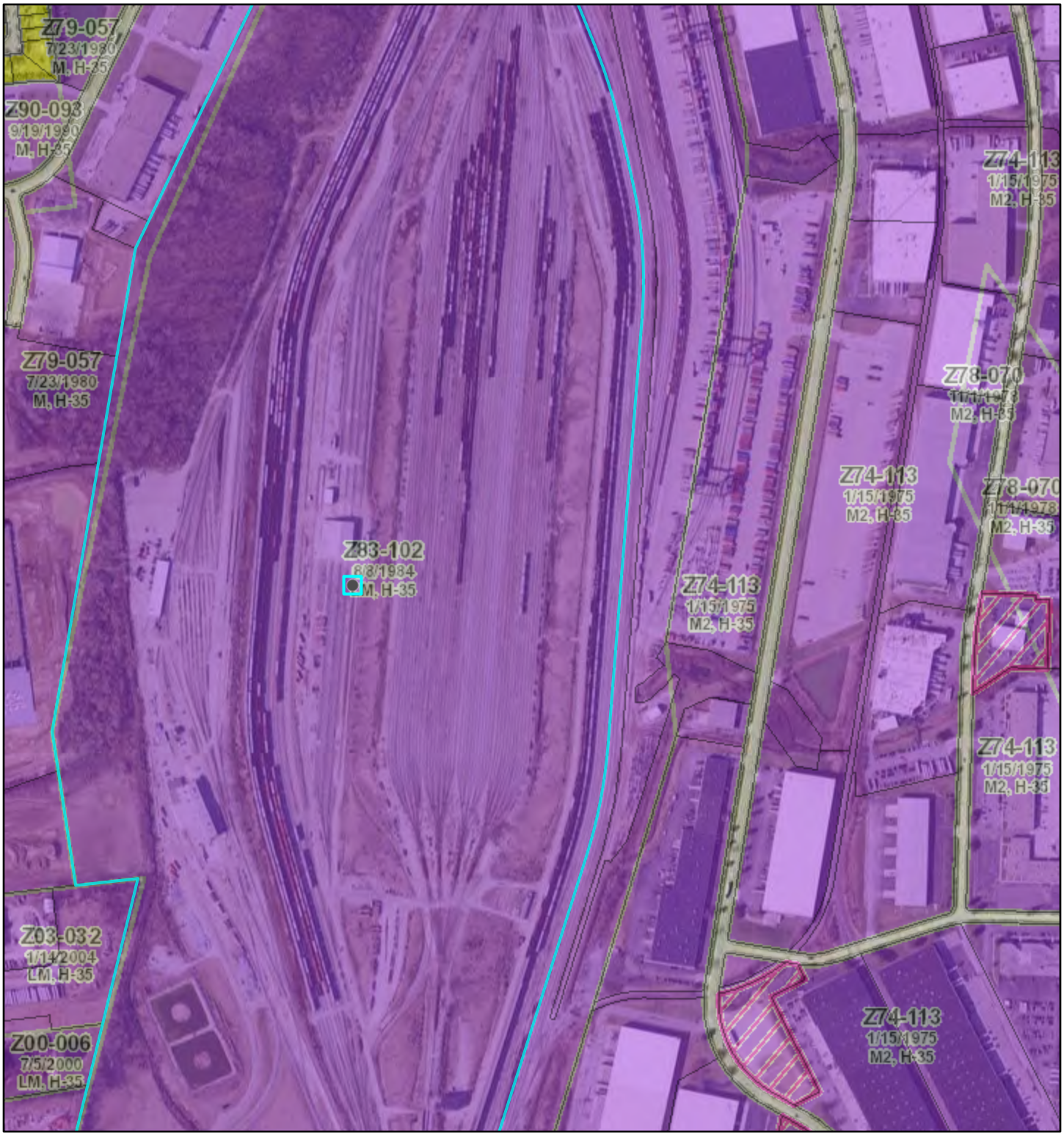
Maxar, USGS The National Map: National Hydrography Dataset. Data refreshed January, 2022.

Ohio EPA
Division of Surface Water

WAU boundaries: Dry Run-Scioto River

HUC12 WAU	050600011205
HUC12 Spaced	05060001 12 05
Assessment Unit Name	Dry Run-Scioto River
WAULabel1	Dry Run
WAULabel2	Scioto R.
Acres	15,769.51
Sq_MILES	24.64
Sq_Km	63.82

Site Location - Columbus Zoning Map



11/16/2021, 12:50:30 PM

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Historic Properties
Corporate Boundary
Parcels

Base Zoning
Commercial
Downtown District
East Franklinton District
Excavation/Quarrying
Institutional
Manufactured Home
Manufacturing
Multi-family
Neighborhood Center
Neighborhood Edge
Neighborhood General
Parking
Research Park
Residential
Town Center
Special Parking Areas
Council Variance

City of Columbus GIS

City of Columbus
City of Columbus GIS |

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

DEPARTMENT OF DEVELOPMENT

Zoning Report

Site Information

Address	
Mailing Address	2100 ROSS AVE STE 895 DALLAS TX 75201-6772
Owner	BUCKEYE XO LLC
Parcel Number	560302753
In Columbus?	Yes
County	FRANKLIN

Zoning Information

Zoning	Z83-102, Manufacturing, LM, 8/8/1984, H-35 Z79-057, Manufacturing, M, 7/23/1980, H-35 Z03-032, Manufacturing, LM, 1/14/2004, H-35 Z00-006, Manufacturing, LM, 7/5/2000, H-35 Z04-044, Manufacturing, LM, 10/19/2004, H-35
Historic District	None
Special Parking Area	None
Council Variance	None
Board of Zoning Adjustment (BZA) Variance	None
Commercial Overlay	None
Planning Overlay	None
Graphics Variance	None
Area Commission	West Scioto Area Commission Far West Side Area Commission
Historic Site	No
Flood Zone	Out
Airport Overlay Environs	None

Pending Zoning Action

Zoning	None
Board of Zoning Adjustment (BZA) Variance	None
Council Variance	None
Graphics Variance	None