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MEMORANDUM

Date: October 12, 2020

From: Christopher Mirto AIA, LEED AP
Peter E. Heinz AIA

Re: Boulder County Compost Processing Facility – Development Report/Narrative
PEH# 2018.08

The purpose of this Special Use Review Application is to obtain approval for the proposed improvements to the former Rainbow Tree Nursery located at 5762 N. 107th Street in Longmont. This application focuses on the proposed development of the 39.7-acre site to become the new regional Boulder County Compost Processing Facility.

The property consists of three parcels that are planned to be combined under a separate Subdivision Exemption application. As part of this application, the vast majority of the proposed development will occur on Lot 1 (approximately 21.6A). Most of the remaining Lot 2 (9.2A) and all of Lot 3 (approximately 8.9A) will remain undeveloped. The design team has studied how a future expansion of the proposed compost facility would fit onto the entire site. The site is currently zoned A – Agricultural, which allows a compost facility when submitted under a Special Use Review application.

This proposed development will construct a compost facility that is planned to accept a maximum of 50,000 tons of compost feedstock per year. An operational narrative has been attached to this Development Report/Narrative to better describe the operational details of the facility.

Site Access

The existing southern access point on US-287 will be closed and a new, safer, centralized access point will provide better access for vehicles of all sizes visiting the site. Immediately upon entering the site, vehicular traffic will be split to direct visitors and residential dropoff/pickup customers to the north to the "public" portion of the site, while commercial (landscaper) and industrial (Western Disposal, etc.) trucks will be directed to the east, where the heart of the compost operations are located.

Commercial and industrial trucks will queue upon entering the site for check-in/weigh-in. Some smaller commercial trucks will drop off at the "Small Volume Drop-Off" area and then turn around to exit the site. Industrial trucks will proceed into the hammerhead, then back into the Tipping Building to drop off their load. Backing operations for large vehicles have been localized to this portion of the process. Once trucks are empty, they will exit the site onto US-287.

Trucks for finished products will follow the same initial movements, but once at the Tipping Building, they will continue on to an access road through the Wood Processing Area and around to the Finished Product Area. Here they will be loaded via a front-end loader, and will then exit the site the same way as empty trucks. No backing movements will be required as part of this loading operation.

The existing northern access point will remain for emergency access to the site, but it will not be open at any time for daily ingress/egress for the site.

Landscaping & Views

As the site of a former nursery, the proposed development has many trees to contend with. The design team has worked extensively with the County Forester and the County Arborist to determine the most environmentally friendly path forward, while still allowing for the necessary site operations.

During the days of the nursery, trees were planted with short-term harvesting in mind (i.e., close spacing in close rows). With the site having been dormant for several years, the trees have continued to grow and have begun to entangle, and in some cases, have affected the health of adjacent trees. This unchecked growth is combined with a significant number of ash trees having been planted with the past intent to harvest and sell. These ash trees are non-native to Boulder County and due to the emerald ash borer, have been identified by the County to be removed on all County-owned properties.

These concerns with the number and species of existing trees are at odds with the County's and design team's shared desire to retain as many trees as possible for screening, air quality, and view preservation reasons. Therefore, the design team has worked with the County Arborist to begin developing a plan to integrate the site planning with a landscape plan that preserves as many trees as possible on the site.

All ash trees on the proposed development portion of the site have been shown to be removed. Existing, healthy deciduous trees are being identified to be retained, while unhealthy and/or closely-spaced trees are planned for selective removal. The remaining, healthy deciduous trees will be retained to improve air quality, and to screen the operations on the site from all directions. The small number of existing coniferous trees in the middle of the site have been identified as healthy and suitable for transplanting.

Additionally, the eastern portion of the site is significantly lacking even in existing trees that would properly screen views from neighboring properties. Therefore, the design team has proposed an uninterrupted collection of new trees and transplanted existing coniferous trees along the entire eastern property line to help preserve the view and screen site operations for neighbors to the east.

Traffic

Fox Tuttle Transportation Group has authored a traffic study, attached to this narrative, that has informed the site ingress/egress design. Based on the number of trips per day (visitors, residential customers, commercial/landscapers, industrial) expected for the site, a non-signalized free turn intersection with US-287 is recommended. Additionally, trip metrics fall below CDOT requirements for deceleration and acceleration lanes.

Utilities

The former tree nursery was served by a combination of municipal and on-site utilities. The proposed development will use and expand on as much of the existing utilities as possible. Below is a summary of utility information for the site, but more detailed information can be found on the memos attached to this narrative, and on the grading/drainage/utility plans created by JVA, Inc.

Water

The existing water tap in US-287 and water meter for the Office Building will remain. A new water tap will be installed to provide a loop system on the site for fire and domestic service. Two new water meters will be installed: one for the Tipping Building and Scale Building, and one for the Maintenance Building.

No fire sprinklers are required for any of the buildings, but the loop system on the site will provide service for three new fire hydrants on the site.

Boulder County currently owns shares in the Boulder & White Rock Ditch Company, and in the Northern Colorado Water District. For new and existing landscaping, and for on-site processes related to the

compost operation, water from one of these sources could be conveyed to the Leggett Ditch as needed, and/or the on-site pond could be drawn upon for use.

Sanitary Sewer

There is an existing septic tank/leach field that serves the Office Building. It is in serviceable condition and will remain in use. Two new septic tanks/leach fields will be installed: one for the Scale Building, and one for the Maintenance Building.

Gas

The former tree nursery was served by multiple propane tanks located north of the Office Building. The design team is currently working with Xcel to determine whether the existing gas line in US-287 may be tapped to provide gas service to the proposed development. If this is not feasible, then propane tanks will be installed to serve the buildings on site.

Electric

The existing electrical service to the Office Building shall remain. Xcel Energy will furnish a new 208/120V pad-mounted transformer, originating at the nearest Xcel overhead facility along US-287. Power will then be distributed to each of the three new buildings on site.

Buildings

Office Building

Visitors and residential dropoff/pickup customers will check in at the 3,225 SF Office Building. This building is a repurposing/rehabilitating of the only existing intact structure on the site, which is a wood-framed building that was previously used as the main check-in and point of sale for the old tree nursery. The Office Building will receive customers/visitors, provide office and meeting space, and will have an indoor retail display area where customers can pick up bags of finished product.

The building will retain its existing foundation and structure, but all other exterior and interior finishes will be new. The building will be brought up to the energy code currently adopted by the County.

Scale House

The 485 SF Scale House is the first point of contact for commercial and industrial vehicles accessing the site. Vehicles will check in with the scale operator, get weighed, and continue on to the operations portion of the site.

The building will be conventionally framed and clad with prefinished metal exterior wall and roof panels. The building will comply with the energy code currently adopted by the County.

Tipping Building

The 17,590 SF Tipping Building is one of the main components of the compost operations on the site. It is here that feedstock (both food waste and green waste) is brought to be prepared and mixed before transferring to the next step in the operation. This building is a fully enclosed, fully contained component of the operation that will minimize odors, provide visual screening, and prevent any leaching of feedstock liquids into the surrounding soil. The building will have a clear interior vertical distance sufficient to allow large trucks to tip their load within the building.

The building will be a pre-engineered metal building with prefinished metal exterior wall panels and roof panels. The building will comply with the energy code currently adopted by the County.

Maintenance Building

The 3,040 SF Maintenance Building will provide support services for the site, including bays for vehicle and equipment maintenance and washing, and a meeting point/break room for operations staff.

The building will be a pre-engineered metal building with prefinished metal exterior wall panels and roof panels. The building will comply with the energy code currently adopted by the County.

Operations

A "Basic Operational Narrative" has been attached to this narrative. This document describes basic components of access, internal traffic patterns, and compost operations on the site.

Generally, the facility is planned to operate Monday through Saturday, from 7am to 6pm. The County is also considering a 5 day (Monday through Friday) schedule.

The facility will implement a "covered aerated static pile" system (CASP) for its primary compost operations, which is the first of its kind in Colorado, but has been successfully applied in other facilities across the country. This system has several key benefits:

- **Odor control**. The CASP bunkers have been shown to reduce odors by 90-95% over conventional open pile windrow systems.
- **Pest control**. The covered condition of the piles will eliminate the ability for pests to access the in-process compost operations. Combined with the fully enclosed Tipping Building, and strict EPA/CDPHE guidelines for pest control on compost sites, the site will offer little to no appeal for off-site pests.
- **Groundwater control**. The Tipping Building and CASP bunkers, which are the only areas that contain potentially harmful raw materials, are fully contained and have no communication with the on-site wastewater treatment systems. Any liquids generated within these components are captured and either recycled back into the system, or trucked off-site to a nearby municipal treatment plant. A groundwater monitoring & testing plan will be implemented for the operation, which consists of multiple monitoring/testing wells installed across the site. These wells will be sampled quarterly per CDPHE regulations, and test results will be logged and reported to CDPHE.
- **Process efficiency**. Conventional windrow (open) composting operations can take up to 6 months to finish. The CASP process produces compost that is fully cured within 8 to 12 weeks.

This proposed development will be the next step in moving toward Boulder County's published goal of "zero waste or darn near" by 2025. Several entries in Boulder County's "Zero Waste Action Plan" point toward supporting composting operations, supporting bans on yard material & food scraps going to landfills, and promoting markets for county-generated recyclables and compost. This facility will help accomplish all of those goals, in addition to significantly reducing the current 50 mile one-way trip required to truck compostable materials generated within Boulder County to outside of the County.

Regarding Boulder County Land Use Code, Article 4 "Zoning", Section 3-203 "Standards for Submittal Requirements", Subsection E "Development Report", see the attached Ecological Assessment and Wildlife Impact Report, authored by Birch Ecology, which addresses items 'b' through 'h'. Item 'a' is addressed through the attached list of owners within 1,500 feet of the proposed project site.

Regarding Boulder County Land Use Code, Article 4 "Zoning", Section 3-203 "Standards for Submittal Requirements", Subsection F "Engineering Report":

1. Item 'c' "Sewage Collection": See memo from JVA, Inc. titled "Boulder County Compost Process Facility – Onsite Wastewater Treatment System Evaluation & Preliminary Design".
2. Item 'd' "Water Supply and Distribution": See memo from JVA, Inc. titled "Utility Evaluation for the Boulder County Compost Facility".
3. Item 'e' "Grading Report": See Grading Plan exhibit in the submitted plan set.
4. Item 'f' "Drainage Report": See report from JVA, Inc. titled "Preliminary Stormwater Report for Boulder County Compost Facility".
5. Item 'h' "Transportation System Impact Analysis": See traffic report from Fox Tuttle Transportation Group titled "Boulder County Composting Facility Traffic Impact Study".

END OF MEMO

ECOLOGICAL ASSESSMENT &

WILDLIFE IMPACT REPORT

BOULDER COUNTY COMPOST PROCESSING FACILITY

BOULDER COUNTY, COLORADO

prepared for:

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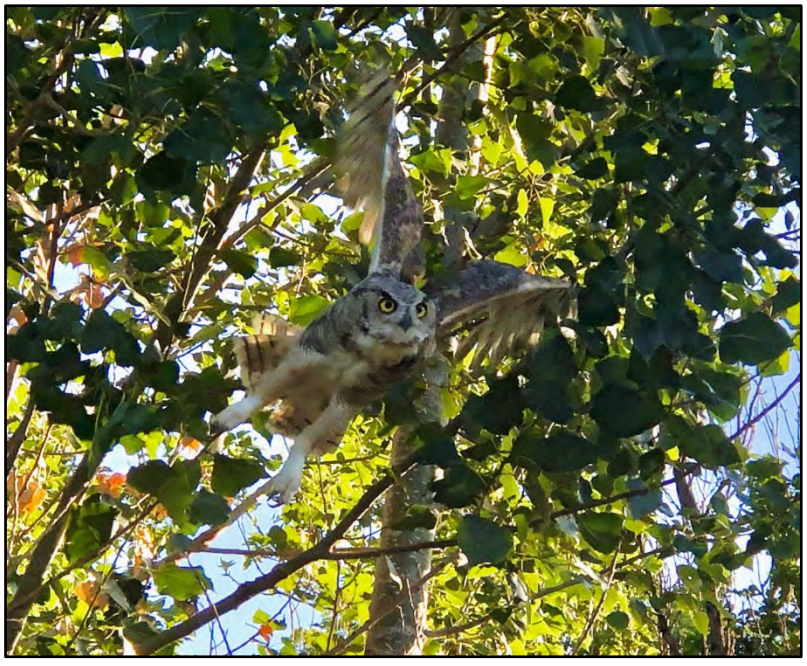


1.0 INTRODUCTION

Boulder County is developing plans to build a Compost Processing Facility on the site of the former Rainbow Nursery, located at 5762 N 107th St, south of Longmont, Colorado in unincorporated Boulder County. Specifically, the property is located in Section 6 of Township 1 North and Range 69 West in Boulder County, Colorado (Figures 1 & 2).

The nursery property was acquired by Boulder County after the facilities were abandoned by the previous landowners. Rows of ornamental, native, and invasive trees and shrubs cover a majority of the 39-acre parcel. The compost processing facility would be built on the north side over approximately half of the property, overlapping with the removal of unhealthy and disease-prone species while preserving selected trees for screening. To aid in preparation of the Development Report, Birch Ecology prepared an Ecological Assessment and Wildlife Impact Report for the project site.

Specifically, this report addresses the natural resources, cultural resources, and hazardous materials components of the Development Report. It describes the existing conditions of the proposed building site, including topography and climatology; waterbodies and areas subject to flooding; soil characteristics and farmland classification; and vegetation communities and wildlife habitats. In addition, it discusses the resources identified in the Boulder County Comprehensive Plan Update for the project vicinity. Record search results for cultural resources and hazardous materials are also provided. In addition, this report describes the proposed project and discusses the potential impacts based on a conceptual site plan. Please note, all Figures are included in Section 9.0; Tables are in Section 10.0, and Photos are in Section 11.0. Appendix A contains the U.S. Fish & Wildlife Service's IPAC species report for the project area; Appendix B contains the results of the History Colorado records search, and Appendix C is a GeoSearch report for hazardous materials.

2.0 ENVIRONMENTAL SETTING

The project site is surrounded by agricultural fields in an area with dispersed low-density development (Figure 2). The site is accessed from Highway 287 along the property's western border, just south of Highway 52. Nearby waterbodies include Panama Reservoir Number 1 to the northeast and the Boulder Creek riparian corridor approximately one mile to the southeast. The Erie North Water Reclamation Facility lies downstream Boulder Creek, approximately 3 miles from the site. A meandering system of ditches extends across the surrounding farmlands.

The project site stands out from its open surroundings, with rows of mature trees covering a large extent of the 39 acres. The tree canopy was established during the previous nursery operation, with rows of ornamental species interspersed with naturally occurring plains cottonwood *(Populus deltoides)* trees (Photo 1). Several dilapidated structures are left standing on the property, including a small office building and greenhouse at the western entrance and larger greenhouses to the east (Photo 2). Nursery-grown trees, shrubs and weeds have grown through the fallen roofs of the greenhouses (Photos 3 & 4). Trees that have matured and rooted into the soil through the pots or wire baskets can be found throughout the site; many have died (Photo 5). The long-term viability and structural integrity of the remaining trees is in question because the root systems are compromised by nursery pots

and/or constricting wire baskets. Empty pots and debris from the old nursery operation are common (Photo 6).

The northwest and southeast corners are historically open areas and remain largely so today. Close to the entrance, the northwestern portion of the property was previously covered by a gravel surface and used for potted plant displays. After nursery operations ceased, volunteer vegetation took hold. A thick carpet of wild carrot *(Daucus carota)*, an escaped ornamental, has formed in the understory of the nursery rows, interspersed with the noxious weed Canada thistle *(Cirsium arvense)* and agricultural grasses such as smooth brome *(Bromus inermis)* (Photo 7).

The southeastern portion of the property is an open area consisting largely of mown grasses and weeds, with several old berms from the nursery operation that are vegetated by dense stands of weeds (Photo 8). A small manmade irrigation pond is present in this area and there are smaller lateral ditches along the fence line, which are fed by Leggett Ditch (Photos 9 & 10). Drawing from Boulder Creek, Leggett Ditch supplied irrigation for past nursery operations. Two main lateral ditches run along the north and south property borders. Based on historical aerial imagery, it appears that the laterals supplied a gravity-fed drip system, suggesting that the property was not flood irrigated. This system is no longer in use.

3.0 METHODS

Heather Houston and Erin Hauer of Birch Ecology, LLC conducted field reconnaissance on the property on June 2, 2020 to document the ecological condition of the project area. Heather mapped and inventoried the vegetation communities and evaluated whether any sensitive or rare plants or plant communities are present, including a habitat assessment for the Ute ladies' tresses orchid *(Spiranthes diluvialis)*.

Jerry Powell of Wildlife Specialties, LLC evaluated the habitat conditions for wildlife on August 25, 2020. The habitats were assessed based on the plant community, topography, site use, etc. to determine the suitability to provide all life history requirements for sensitive wildlife species. Prior to field reconnaissance, federal, state and local lists of sensitive species were reviewed. In addition, Geographical Information System (GIS) mapping was reviewed for known or suspected sensitive species habitats in the vicinity.

The U.S. Fish and Wildlife Service's Information, Planning and Conservation System (IPaC) website (USFWS 2020) was accessed on September 8, 2020 to identify the federally listed threatened, endangered and candidate plant and wildlife species (and designated critical habitat) and Migratory Birds of Conservation Concern with potential for occurrence at the Project site. In addition, Colorado Parks and Wildlife's (CPW 2020) list of State Threatened, Endangered and Species of Special Concern and the Boulder County list of Species of Special Concern are addressed in this report. In addition, the Boulder County Comprehensive Plan (Boulder County 2016) wildlife maps showing critical habitats etc. were reviewed to determine if critical habitats existed at or near the Project site.

Sources of information on the habitat requirements for wildlife species presented in the above lists comes from the Colorado Breeding Bird Atlas 2nd Edition (Colorado Bird Atlas Partnership

2016), Mammals of Colorado 2nd Edition (Armstrong et al. 2011), and Amphibians and Reptiles in Colorado (Hammerson, 1999). Online resources consisted of the Colorado Parks and Wildlife (CPW) website, USDA Forest Service species accounts, and NatureServe (2020). Likelihood of presence or absence was based on each species' specific habitat requirements, known distribution range, and the quality of habitat within the project site.

4.0 EXISTING CONDITIONS

4.1 Topography and Climatology

The project site has a relatively flat topography that slopes and drains to the southeast. Elevations range from a high of approximately 5,075 feet in the northeast to a low of 5,060 feet near the manmade pond in the southeastern corner. The site is located within the Great Plains Palouse Dry Steppe Province of the Temperate Steppe Division (Bailey, 2016). More specifically, it site lies within the Front Range Fans (Level IV) of the High Plains (Level III) Ecoregion. The region receives a mean annual precipitation of 12-20 inches and an average of 14-18 frost-free days per year; the minimum to maximum mean temperatures in January and July are 14°/42° and 60°/92°, respectively (Chapman et al., 2006).

4.2 Groundwater

Geotechnical investigations of the site are being conducted by Cesare, Inc. Groundwater was generally encountered at 5' (±1') below the surface at all borehole locations.

4.4 Streams, Waterbodies and Floodplains

The region is characterized by fans, irregular plains, and low hills consisting of gravely to sandy substrates that form the beds of colder intermittent and perennial streams (Chapman et al., 2006). While Boulder Creek is the most proximate riparian corridor, the project site lies well outside of FEMA Flood Risk Zones including the 100-Year and 500-Year Floodplain of Boulder Creek.

4.3 Vegetation

4.3.1 Vegetation Communities

The dominant vegetation type on the project site consists of ornamental trees and shrubs that remain from the old nursery operation (Photo 11). Green ash makes up a high percentage this cover. This species is susceptible to the emerald ash borer (EAB), which is known to occur on the site, therefore they have been identified for removal (Photo 12). As described above in Section 2.0, the abandonment of nursery operations resulted in a weedy upland plant community of invasive grasses and escaped ornamental perennials in open areas, and extending into the understory of the nursery stock (Photo 7). A few large, mature cottonwoods are scattered throughout the site. Table 1 list the vascular plant species identified within the project are during field reconnaissance on September 14, 2020. Each vegetation community is briefly discussed below.

Ornamental Trees and Shrubs

The previously cultivated rows of nursery stock established a relatively dense cover of primarily deciduous ornamental trees and shrubs (Photo 13). Dominant species include green ash *(Fraxinus pensylvanica)*, autumn blaze maple *(Acer sp)*, and honeylocust *(Gleditsia tricanthos)*

interspersed with crabapple (*Malus sp.*) and Shubert chokecherry shrubs. A small number of conifers are also present. Ornamental shrubs such as honeysuckle *(Lonicera sp.)* are located in the proximity of greenhouse structures. The weeds and grasses between the rows of trees are mowed for weed control (Photo 14). Green ash is susceptible to infestation and decline caused by the invasive emerald ash borer *(Agrilus planipennis)*, and the high density of this species on the site brings concern for the long-term health of the tree canopy (Photo 12). In addition, many of these trees have rooted through their pots or wire nursery baskets, and the site is no longer irrigated – both factors may have a long term negative impact on the tree canopy that is to remain.

Weedy Uplands

Exposed soil stockpiles from the nursery operations and subsequent abandonment of the nursery has resulted in the disturbed areas becoming colonized by dense stands of weeds (Photo 8). These stockpiles of soil are now overgrown with curly dock *(Rumex crispus)* and smotherweed (*Bassia hyssopifolia*). Common non-native forbs growing around dilapidated structures, amid piles of downed tree trunks, and throughout the understory of the nursery grown tree canopy include wild carrot *(Daucus carota)*, English plantain *(Plantago lanceolata)*, Japanese brome *(Bromus japonicus),* white sweet clover *(Melilotus albus)*, yellow sweet clover *(Melilotus officinalis),* common mallow *(Malva neglecta),* dandelion *(Taraxacum officinale)*, alfalfa *(Medicago sativa)* and noxious species such as cheatgrass *(Bromus tectorum),* great mullein (*Verbascum thapsus*), field bindweed *(Convolvulus arvensis),* and teasel *(Dipsacus fullonum ssp. sylvestris)* (Photo 6). In addition, the native common sunflower, *(Helianthus annuus),* plains sunflower *(Helianthus petiolaris)*, and gumweed *(Grindelia squarrosa)* are common in the more open areas.

Irrigation Ditch Vegetation

Maintenance along Leggett Ditch and lateral ditches on the property has created steep banks that limit the lateral extent of wetland development (Photo 9). Leggett Ditch was flowing at the time of assessment, whereas the lateral ditches were dry. Along the Leggett ditch, a narrow band of emory *sedge (Carex emoryi)* and the non-native reed canarygrass *(Phalaris arudinacea)* grow along the high water line. Reed canarygrass was among the invasive and non-native species growing in the drier areas on the upper part of Leggett Ditch and unused lateral ditches, along with smotherweed, kochia *(Kochia scoparia)* Japanese brome, cheatgrass, Russian thistle *(Salsola australis)*, giant ragweed *(Ambrosia trifida),* and prickly lettuce *(Lactuca serriola)*. Other common species along the ditch include forbs such as showy milkweed *(Asclepias speciosa)* and the noxious weeds Russian olive *(Elaeagnus angustifolia),* teasel *(Dipsacus fullonum ssp. sylvestris)*, Canada thistle *(Cirsium arvense)*, and musk thistle *(Carduus nutans ssp. macrolepis)*.

Perimeter of the Irrigation Pond

The man-made irrigation pond's edge is steeply sloped which limits the lateral extent of wetland development (Photo 10). A small dock extends a short distance into the pond. Narrowleaf cattail *(Typha angustifolia*) and hardstem bulrush *(Scirpus acutus)* grow in the saturated soil along the banks, along with the non-native reed canarygrass *(Phalaris arundinacea)*, curly dock *(Rumex crispus)* and the noxious weed teasel growing further up the banks. The pond margin supports mature plains cottonwoods along with a few saplings, and a group of noxious Russian olive *(Elaeagnus angustifolia)* trees.

4.3.2 Federally Listed Threatened and Endangered Plants

The Ute ladies' tresses orchid *(Spiranthes diluvialis)* and western prairie fringed orchid *(Platanthera praeclara)* are identified as 'threatened' on the IPaC Species Report contained in Appendix A. The Ute ladies' tresses orchid is known to occur in Boulder County and is discussed below. The project would not create water depletions to the South Platte River System and therefore would have no impact on the western prairie fringed orchid.

Ute Ladies' Tresses Orchid

The Ute ladies' tresses orchid is a federally threatened perennial, terrestrial orchid endemic to moist soils in mesic or wet meadows near springs, lakes, or perennial streams (USFWS, 1995; Jennings, 1990). In Colorado, the elevational range of known orchid populations is between 4,500 and 6,800 feet (Spackman et al., 1997). The orchid prefers sites with permanent sub-irrigation such as floodplains where the water table is near the surface throughout the growing season and into the late summer or early autumn (USFWS, 1995; Jennings, 1990).

The current distribution of Ute ladies' tresses orchid includes populations in Colorado, Wyoming, Nebraska, Utah, Idaho, Montana, and Nevada (CNHP, 2018). Colorado supports populations of the Ute ladies' tresses orchid in relict tallgrass prairie and irrigated pastures near South Boulder Creek in Boulder County, and in mesic meadows in the riparian woodland understory along Clear Creek in Jefferson County. Smaller populations have been identified adjacent to St. Vrain Creek near Hygiene in Boulder County and near the Cache La Poudre River at the northwest edge of Fort Collins in Weld County, Colorado. Historic collections from Colorado were made in 1856 from the South Platte River and in 1896 from Camp Harding near Colorado Springs in El Paso County.

The Ute ladies' tresses orchid is relatively intolerant of competition and is found primarily in communities where the vegetation is open and not overly dense or overgrown (USFWS, 1995; Jennings, 1990). It cannot compete with emergent species such as cattails *(Typha sp.)* or aggressive species that form dense monocultures such as Canada thistle *(Cirsium arvense)* and reed canarygrass (USFWS, 1995). Common associates in Colorado's Front Range populations include redtop, marsh milkweed *(Asclepias incarnata)*, bluejoint reedgrass *(Calamagrostis sp.)*, horsetail *(Equisetum sp.)*, lobelia *(Lobelia siphilitica)*, blue-eyed grass *(Sisyrinchium sp.)*, goldenrod *(Solidago sp.)*, arrowgrass *(Triglochin sp.)*, and blue vervain (USFWS, 1995).

The Ute ladies' tresses orchid prefers soils ranging from fine silt and sand to gravels and cobbles. Occasionally, populations occur on highly organic or peaty soils. Soils composed of heavy or tight clay are typically unsuitable for this species. In addition, the orchid is not found in extremely saline or alkaline soils (pH > 8.0) (USFWS, 1995).

The orchid frequently colonizes early-successional riparian habitats including point bars, sand bars, and low lying gravelly, sandy, or cobbly edges. These preferred habitat characteristics suggest that this species requires early to mid-seral riparian habitats created and maintained by streams active within their floodplains (USFWS, 1995).

Based on field reconnaissance conducted in September 2020, no habitat for the Ute ladies' tresses orchid exists on the project site. The margins of irrigation pond and ditches contain steep banks with dense vegetation such as Canada thistle and smooth brome, which

precludes this orchid's presence. In addition, the site lacks the subirrigated, alluvial floodplain habitat required by the orchid.

4.3.3 State Listed Plants

Appendix A of Colorado's Statewide Wildlife Action Plan includes 117 species of Colorado's most imperiled plant species. Of these, ten species are known to occur in Boulder County, as summarized in Table 2. Two of these species are known to occur in plains wetlands environments, the Ute ladies' tresses orchid and the Colorado butterfly plant. The Ute ladies' tresses orchid is addressed in detail in section 4.3.6. above, and Colorado butterfly plant is discussed below.

Colorado Butterfly Plant

The Colorado butterfly plant *(Gaura neomexicana ssp. coloradensis)* is a short-lived perennial herbaceous plant. This subspecies is distinguished from the New Mexico butterfly plant *(Gaura neomexicana ssp. neomexicana)* based upon differences in pubescence and its disjunct range (Rocky Mountain Heritage Task Force, 1987).

All the currently known populations of the Colorado butterfly plant occur within a small, 17,000-acre area in southeast Wyoming, western Nebraska, and north-central Colorado (USFWS, 2000; CNHP 2018). In Colorado, historic collections have been made in Adams, Boulder, Weld, Douglas, Jefferson, and Larimer Counties (CNHP, 2018). However, the only natural populations of the butterfly plant presently known in Colorado are at Meadow Springs Ranch and the adjacent Soapstone Ranch near Fort Collins, Colorado.

This subspecies occurs primarily on subirrigated alluvial soils on level or slightly sloping floodplains and drainage bottoms at elevations between 5,000-6,400 feet (USFWS, 2000). The butterfly plant requires early- to mid-successional riparian habitat, and colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel (USFWS, 2000). The Colorado butterfly plant appears to require shallow subsurface water, and it is not found where streams are deeply incised (Rocky Mountain Heritage Task Force, 1987).

The Colorado butterfly plant is very unlikely to occur on the project site given the known range and the limited wetland areas that are present along the Leggett ditch and the man-made irrigation pond. The disturbed conditions and lack of subirrigated alluvial floodplain habitat make its presence unlikely.

4.4 Wildlife Habitat

While Boulder County mapping does not show critical wildlife habitat on or adjacent to the property, wildlife sightings during site visits suggests that the tree canopy small coverage of waterbodies on the site offer a degree of wildlife habitat. Notable signs of life that were observed during two site reconnaissance visits is September 2020 include a turtle in the irrigation pond and a great horned owl seen among the trees.

Because the Project site is an abandoned tree nursery there are multiple tree species offering nesting and foraging habitat for a wide variety of Neotropical Migratory Landbird species. Additionally, the lack of mowing of grasses/weeds below the nursery rows has resulted in thick cover capable of supporting common wildlife including the ubiquitous deer mouse

(Peromyscus maniculatus), house mouse *(Mus musculus)*, voles *(Microtus sp.)*, raccoons *(Procyon lotor)*, striped skunks *(Mephitis mephitis)*, american robin *(Turdus migratorius)*, black-capped chickadee *(Poecile atricapillus)*, eastern kingbird *(Tyrannus tyrannus)*, European starling *(Sturnus vulgaris)*, Northern flicker *(Colaptes auratus)*, and song sparrow *(Melospiza melodia)*.

4.4.1 Federally Listed Wildlife Species

The U.S. Fish & Wildlife Service's Information, Planning and Conservation (IPaC) Website was accessed on September 8, 2020 to identify the federally listed species of concern for the project area (Appendix A). These species are addressed in Table 3, and include two fish, four birds, and two mammals. As summarized by the table, the proposed project site and surrounding areas do not offer suitable habitat for any federally listed wildlife species. Additionally, there is no Designated Critical Habitat near the project site. The proposed facility would not cause depletions to the South Platte River System which could impact listed species that occur downstream in the South Platte Watershed. A brief discussion of Preble's Meadow Jumping Mouse is included below.

Preble's Meadow Jumping Mouse

Habitat for PMJM along the Front Range of Colorado typically consists of a matrix of riparian vegetation and associated upland grasslands and shrubs (Armstrong et al. 2011; Shenk and Sivert, 1999). Riparian vegetation typically is varied with a mixed overstory comprised of willows (*Salix* spp.) and cottonwoods (*Populus* spp.), and an understory of scattered shrubs including snowberry (*Symphoricarpos* spp.). Two major habitat components appear necessary: open water and dense cover.

In addition to these habitat features, suitable habitat must also provide requirements for survival throughout the life cycle (Shenk, 1998). This means that habitat for the active period and hibernation period are essential. Active period habitat must provide areas where reproductive activities and daily survival can occur. Hibernation habitat is not just that habitat in which hibernacula are created but also provides adequate food sources for fat storage during hibernation. Habitat for active and hibernating periods does not have to occur in the same location but must be connected.

Based on field reconnaissance conducted by Jerry Powell on August 25th, 2020, the proposed building site and adjacent area of Leggett Ditch do not provide suitable habitat for the Preble's meadow jumping mouse (PMJM - *Zapus hudsonius preblei*). Habitat for active and hibernating periods are not present within or near the project site and there is no connectivity with other locations where these are available. Moreover, neither the USFWS nor Boulder County have identified PMJM Designated Critical Habitat near the project site. No PMJM habitat exists along Leggett Ditch up- or down-stream of the project site.

4.4.2 Birds of Conservation Concern

No suitable habitat for the bald eagle *(Haliaeetus leucocephalus)* is present in the location of the proposed facility, but eagles likely forage over the Project site. No other USFWS identified Migratory Birds of Conservation Concern (Table 5) have suitable habitat within the location of the proposed facility.

4.4.3 Colorado State Listed Wildlife

Three of the state-sensitive wildlife species identified by the CPW (Table 4) have the potential to occur within the Project site. These species are the bald eagle *(Haliaeetus leucocephalus)*, Northern leopard frog *(Rana pipiens)* and common garter snake *(Thamnophis sirtalis)*. The bald eagle likely opportunistically forages over the Project site (e.g. if while flying over the Project site a bald eagle saw a rabbit it could attempt to capture it); the Northern leopard frog could occur in Leggett Ditch; and the common garter snake could occur throughout the Project site.

4.4.4 Raptors

No raptor nests occur within the Project site. However, as mentioned above, a great horned owl was observed during two site reconnaissance visits is September 2020 (Photo 15).

4.4.5 Boulder County Vertebrate Wildlife Species of Special Concern

Of the 124 vertebrate Species of Special Concern identified by Boulder County (Table 6), there is potentially suitable habitat for nine species within the project site. These include four birds, four mammals, and one reptile.

As noted previously, the bald eagle could opportunistically forage over the Project site. The other species are the northern flicker *(Colaptes auratus)*, northern mockingbird *(Mimus polyglottos)* and long-eared owl *(Asio otus)*, all could potentially nest in the many trees found within the Project site.

Potential habitat is present within the project site for the following mammals: big brown bat *(Eptesicus fuscus)*, eastern red bat *(Lasiurus borealis)*, silver-haired bat *(Lasionycteris nactivagans)*, and tri-colored bat *(Perimyotis subflavus)*. These species are generalists and are known to use many types of habitats.

Potential habitat is available for one reptile, the lined snake *(Tropidoclonion lineatum)*. This species is associated with a variety of habitat types and thus could be found within the Project site.

4.5 Boulder County Comprehensive Plan Resources

4.5.1 Farmland of Local, Statewide, and National Importance

Figure 4 illustrates the Farmland Classifications identified in the Boulder County Comprehensive Plan 2013 ERE update in the vicinity of the project site. As shown by the figure, the proposed building site lies within a region classified as Farmland of National and Statewide Importance.

4.5.2 Critical Wildlife Habitat and Migration Corridors

Figure 5 illustrates the Critical Wildlife Habitats mapped by Boulder County in the vicinity of the project site. Critical Wildlife Habitat #17 – Panama Reservoir and Wetlands is located approximately one mile northeast of the project site. No migration corridors were located in the vicinity of the proposed facility.

4.5.3 Preble's Meadow Jumping Mouse Habitat

Figure 5 shows areas mapped by Boulder County as potential habitat for Preble's meadow jumping mouse. These areas are located along the Boulder Creek riparian corridor. There is no habitat for the Preble's meadow jumping mouse mapped within the location of the proposed

facility. Moreover, an onsite habitat assessment conducted by Jerry Powell of Wildlife Specialties, LLC concluded that the site did not contain suitable habitat, as discussed above in Section 4.4.1.

4.5.4 Environmental Conservation Areas

Figure 6 illustrates the Environmental Conservation Areas present in the greater Longmont area identified in the 2013 ERE update. The project site lies within the area identified as Environmental Conservation Area (ECA) #13: East County. This ECA contains conservation easements, creeks, and reservoirs, and the habitat provided by these features including nesting for raptor and great blue herons, and migration corridors between Boulder and St. Vrain Creeks. Adjacent to the property lies ECA #12: White Rocks and Gunbarrel Hill. This area is identified to protect high quality riparian habitat and significant wetlands along Boulder Creek, raptor nesting habitat, as well as rare ants and ferns among other imperiled flora and fauna. None of the high-value features from either ECA occur on the project site.

4.5.5 Natural Landmarks & Natural Areas

Figure 6 illustrates the Natural Areas and Natural Landmarks in the vicinity of the project site. The proposed facility is not located within any Natural Landmarks or Natural Areas designated by Boulder County. As shown by the Figure, the White Rocks natural area lies ± 3 miles southwest of the project site, and three Foxhills Sandstone natural areas are located ± 2-3 miles to the northwest.

4.5.6 Rare Plant Areas & Significant Natural Communities

The Rare Plant Areas and Significant Natural Communities of the project vicinity are illustrated by Figure 7. There are no known Rare Plant Areas or Significant Natural Communities in the immediate vicinity of the project site. Most of these important natural communities are located within the Natural Areas noted above in Section 4.5.6.

4.5.6 High Biodiversity Areas

High Biodiversity Areas from the 2013 ERE update are illustrated on Figure 7. The High Biodiversity Areas shown on the map correspond to the Natural Areas discussed above. There are no High Biodiversity Areas that overlap the project site.

4.5.7 Wetlands

As illustrated in Figure 8, the Boulder County 2013 ERE update identifies Boulder County wetlands in the north- and southeastern corners of the project site. However, no wetlands from the 2013 ERE update lie within the proposed buildable area. As observed during field reconnaissance on September 14, 2020, narrow fringes of emergent wetlands exist along the high water line of the Leggett Ditch, in small lateral ditches along the south fence line, and around the perimeter of the manmade irrigation pond. These would not be disturbed by the proposed facilities.

4.6 Cultural Resources

A record search of the Colorado Inventory of Cultural Resources was conducted on September 22, 2020 by History Colorado (Appendix B). One site, the Leggett Ditch, and one survey were located within the designated area, as illustrated by Figure 9. According to an assessment of Leggett Ditch, it is not eligible for listing on the National Register of Historic Places. The survey area is a linear survey that was completed on the property edge along U.S. Highway 287 in 1982 by the Colorado Department of Highways. The highway survey records

found a total of 10 sites and no isolated findings. There are no known cultural resources in the area of the proposed compost facility.

4.7 Hazardous Materials

A database record search was conducted by GeoSearch on September 18, 2020 to identify any Federal, State, or Tribal listings for environmental hazards lying within a one-mile radius of the target property. The search included records for Colorado brownfield sites, underground storage tank facilities, hazardous waste sites, among many. The search produced no environmental records linked to the property or surrounding area (Appendix C).

5.0 PROPOSED CONDITIONS

5.1 Project Description

The proposed facility will be located just west of Leggett Ditch between Longmont and Lafayette, Colorado. The compost processing facility will accept and process organic materials from residential and commercial sources. The proposed operational footprint extends over approximately half of the 39-acre property and preserves selected areas of trees for screening and landscaping (Figure 10).

5.1.1 Access

The facility will be accessed from Highway 287 via a new wider curb cut that aligns with the main asphalt drive through the site. New asphalt driveways extend into the processing area and to the designated finished product stockpiling area. Emergency access lanes that loop around the operational facilities would be left natural and unimproved.

5.1.2 Compost Facility

The compost facility consists of a tipping building, two bunker areas with a total of 16 bunkers, a maintenance building, scale house, and a garden and demonstration area. Several acres are reserved for wood processing and finished product storage. An existing building will be renovated into a new office building at the entrance for residential access. Separate commercial access overlaps with the existing road and extends to the tipping building for larger-scale drop-off. Processing and storage operations will occur in designated hardscape surfaces and any debris removed during the screening process will be properly disposed of at a permitted landfill.

5.1.3 Stormwater Detention and Water Quality

As illustrated in Figure 11, the stormwater plan maintains the site's existing slope and drainage toward the southeast corner of the property, to a new stormwater detention and water quality enhancement basin located just west of the irrigation pond. Storwmater would be routed to the basin through grass swales which will promote infiltration and sediment removal. The detention basin slightly alters the existing grade, and controls water discharge into the existing lateral ditch via concrete water quality outlet per Mile High Flood District specifications. A 50-foot buffer is maintained around the detention pond from the south and east property lines and the detention basin would not impact the pond. The basin would discharge to an irrigation lateral located on the southeastern fence line.

5.1.2 Landscaping

Newly landscaped areas are strategically located for visual screening and to reduce sound and odor impacts of the facility. To the west, a landscape screen buffers the parking area along Highway 287. A screen of trees borders the eastern edge of the property, separated to the north by the emergency access lane. A landscaped berm extends to the south along the detention pond edge. The planted berms will be constructed where weed dominated areas exist. The new tree zones may include trees identified for preservation and/or transplanting, per Figure 12, the Arborist Report.

6.0 EVALUATION OF PROPOSED IMPACTS

6.1 Impacts to Groundwater

The project site has an existing septic treatment area near the office building and two small, new treatment areas would be created to serve the scale house and maintenance building. These would be constructed in accordance with Boulder County regulations and would not impact groundwater or surface water features. Two small (15' dia.) leachate tanks will be set approximately 5' into the ground between the bunkers and tipping building. Leachate will be carefully managed to ensure there are no impacts to groundwater.

5.2 Impacts to Streams, Waterbodies and Floodplains

The proposed project is located outside the 100- and 500-year floodplain of Boulder Creek. The composting facility would not impact any surface water features, streams or wetlands. The stormwater detention basin will capture surface runoff generated by the facility's nonpermeable surface treatments. The pond will have a water quality outlet and will discharge to an irrigation lateral.

5.3 Impacts to Vegetation Resources

The proposed facility will be constructed in a disturbed upland predominately vegetated with introduced ornamental trees and understory weeds. The operations footprint overlaps with an existing tree canopy dominated by ash, a species susceptible to emerald ash borer infestation resulting low viability. The ash will be removed and selected desirable tree species will be preserved or transplanted to designated screening areas on site. No native vegetation communities will be impacted by the construction of the proposed facility.

5.4 Impacts to Wildlife Resources

No federal, state, or county-identified sensitive species occur within or near the project area. Since the Project site is an abandoned tree farm, it provides nesting habitat for birds. The removal of trees will decrease the project area's capacity to support avian and other wildlife species. Other species (rabbits etc.) which currently use the property will be displaced.

5.5 Impacts to Boulder County Comprehensive Plan Environmental Resources

The construction of the proposed compost processing facility would not impact sensitive environmental resources as identified in the Boulder County Comprehensive Plan 2013 ERE Update.

As illustrated in Figure 4 and discussed above in Section 4.5.1, the proposed facility lies within a region classified as Farmland of National and Statewide Importance. It should be noted thatArticle 4 of the Boulder County Land Use Code lists a composting facility as a permitted use within the Agricultural District, with the condition that the project is submitted under a special use review. Additionally, the previous agricultural tree nursery operations created unique conditions that are ideal for a composting facility location. The existing site border of trees creates a natural setback from the road and would provide visual and odor screening.

Illustrated in Figure 5, the nearest critical wildlife habitat is located along the Panama Reservoir Number 1, approximately one mile to the northeast of the proposed facility. Similarly, the areas of Preble's meadow jumping mouse habitat identified in the 2013 ERE Update (Figure 5) are at least a half mile from the site. A habitat assessment conducted by Jerry Powell of Wildlife Specialties concluded that the project site and adjacent areas of Leggett Ditch are not suitable habitat for PMJM. It should be noted that the Leggett Ditch will not be disturbed by the proposed project.

None of Boulder County's mapped Natural Landmarks, Natural Areas, Rare Plant Areas, High Biodiversity Areas, or Significant Natural Communities extend onto or are adjacent to the project site (Figures 6 & 7). While Environmental Conservation Areas 12 and 13 are mapped adjacent to an on the property respectively, site reconnaissance found that none of the important resources indicated by these designations exist on the actual property. Overall, these resources would not be disturbed by the proposed project.

Finally, no wetlands exist within the area of disturbance. As observed during field reconnaissance on September 14, 2020, narrow bands of wetlands do exist along Leggett Ditch and the margin of the irrigation pond. However, the proposed project will be located in the uplands away from these wetland areas, and the proposed stormwater detention basin will not disturb these features.

5.6 Impacts to Cultural Resources

The assessment of the site by History Colorado determined that no officially designed historic artifacts or sites exist on the property; thus, the project will have no impact on cultural resources.

5.7 Hazardous Materials

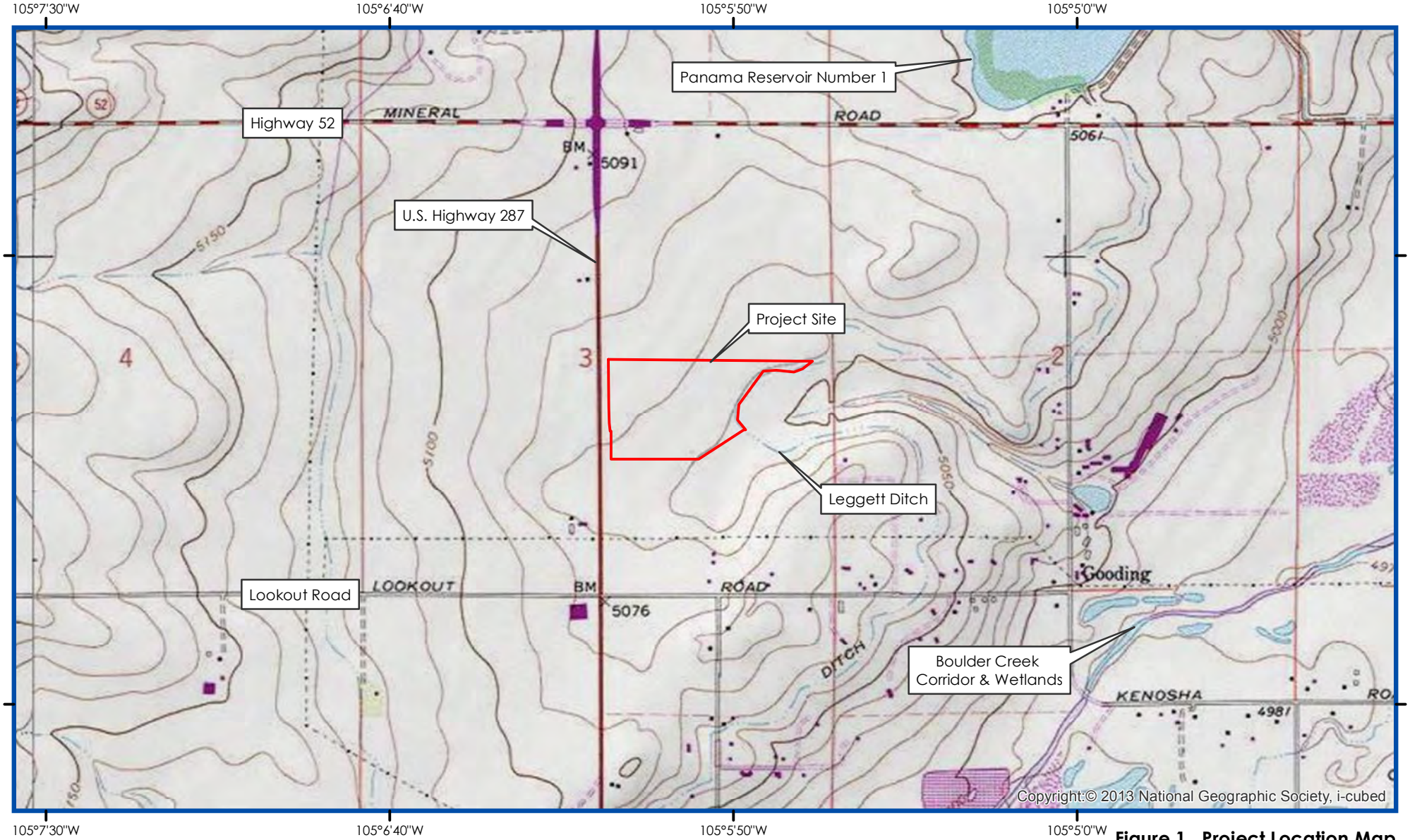
The GeoSearch did not identify any known areas of contamination or hazardous materials within a one-mile radius of the project site.

8.0 SUMMARY & RECOMMENDATIONS

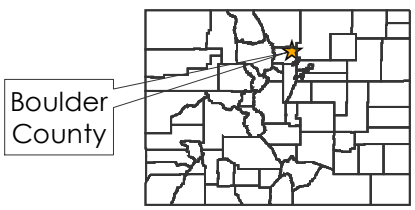
Construction of the proposed compost facility would be compatible with the surrounding area in terms of the ecological resources addressed in this report. The proposed compost processing facility would be located in an area that currently consists of primarily introduced ornamental trees, many in poor health, and with a weedy understory. The project would not result in an over-intensive use of the land or excessive depletion of natural resources since it is already a highly disturbed site with few areas of native plant communities and no sensitive wildlife resources within the footprint of disturbance. Considering the opportunistic nesting and

forage that the tree canopy provides for wildlife, a nest survey is recommended prior to tree removal if completed during nesting season. Regarding the abundance of weeds on the project site, integrated weed management is recommended to control the further spread caused by construction disturbances.

9.0 FIGURES



BASE: USGS 7.5' Erie Quadrangle, Colorado



LEGEND

Project Site

N

1:24,000

0 600 1,200 2,400
Feet

15

Figure 1. Project Location Map
Boulder County Compost
Processing Facility

October 2020

Prepared by:

Birch Ecology LLC

429 Main Street
P.O. Box 170
Lyons, CO 80540
(720) 350-2530
www. birchecology.com

Survey Area

LEGEND

Project Site

N

1:5,000

0 125 250 500

Feet

16

Figure 2. Aerial Photo
Boulder County Compost Processing Facility

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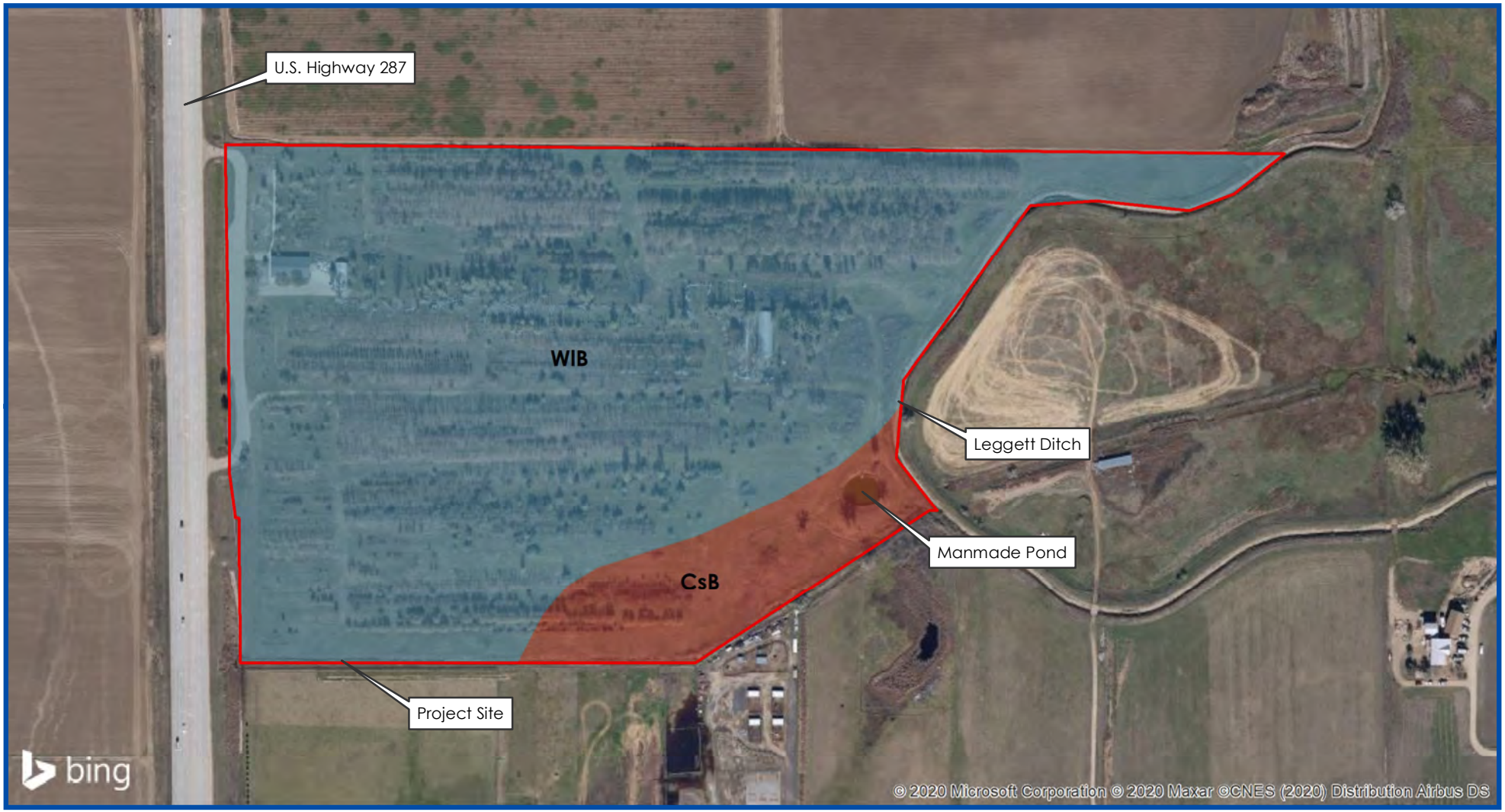

Figure 3. NRCS Soil Map
Boulder County Compost Processing Facility

October 2020

LEGEND

Project Site

NRCS Soil Map Units

CsB - Colby silty clay loam, wet, 0-3% slopes

WIB - Weld loam, 1-3% slopes

N

1:5,000

0 125 250 500
Feet

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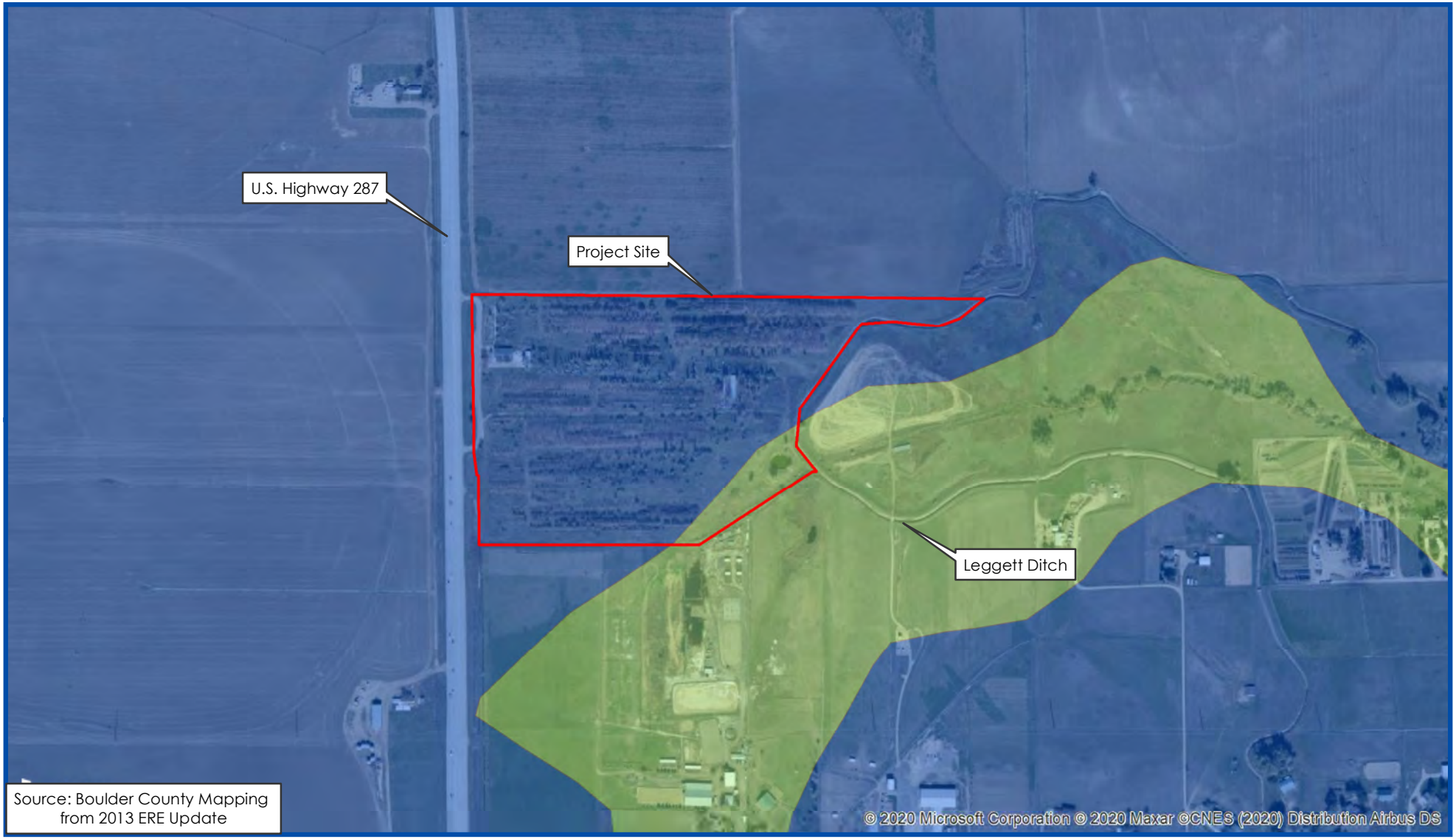

LEGEND

Project Site

Significant Agricultural Lands

Local Importance

National Importance

Statewide Importance

N

1:10,000

0 250 500 1,000

Feet

Figure 4. Boulder County Farmland Classifications Map
Boulder County Compost Processing Facility
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LEGEND

- Project Site
- Prebles Meadow Jumping Mouse Habitat
- Critical Wildlife Habitat

N

1:20,000

0 500 1,000 2,000

Feet

Figure 5. Critical Wildlife Habitat Map
Boulder County Compost Processing Facility

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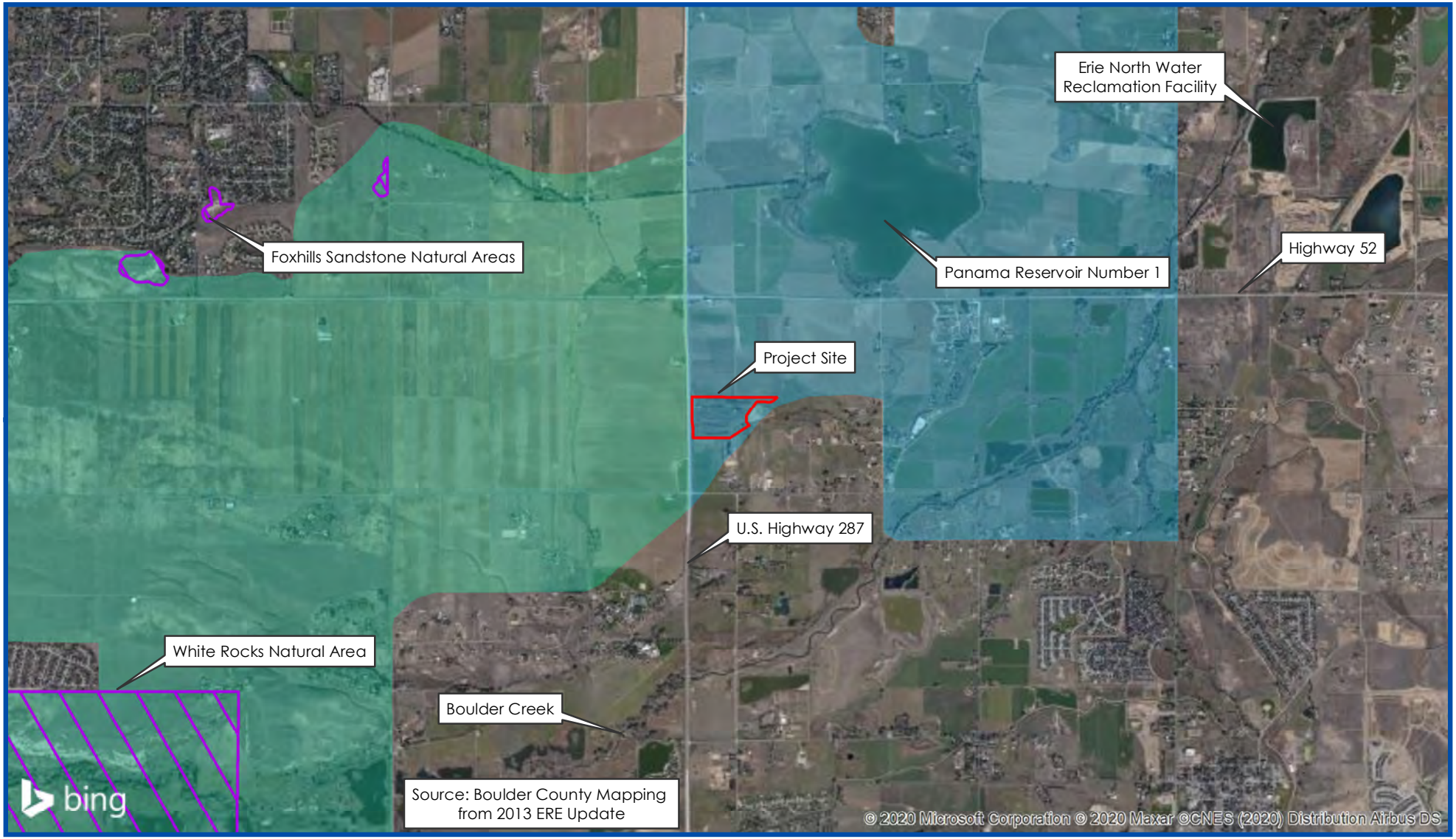

LEGEND

- Project Site
- Natural Landmarks and Natural Areas
- Environmental Conservation Area No. 12
- Environmental Conservation Area No. 13

N

1:60,000

0 1,500 3,000 6,000

Feet

20

Figure 6. Environmental Conservation Areas Map
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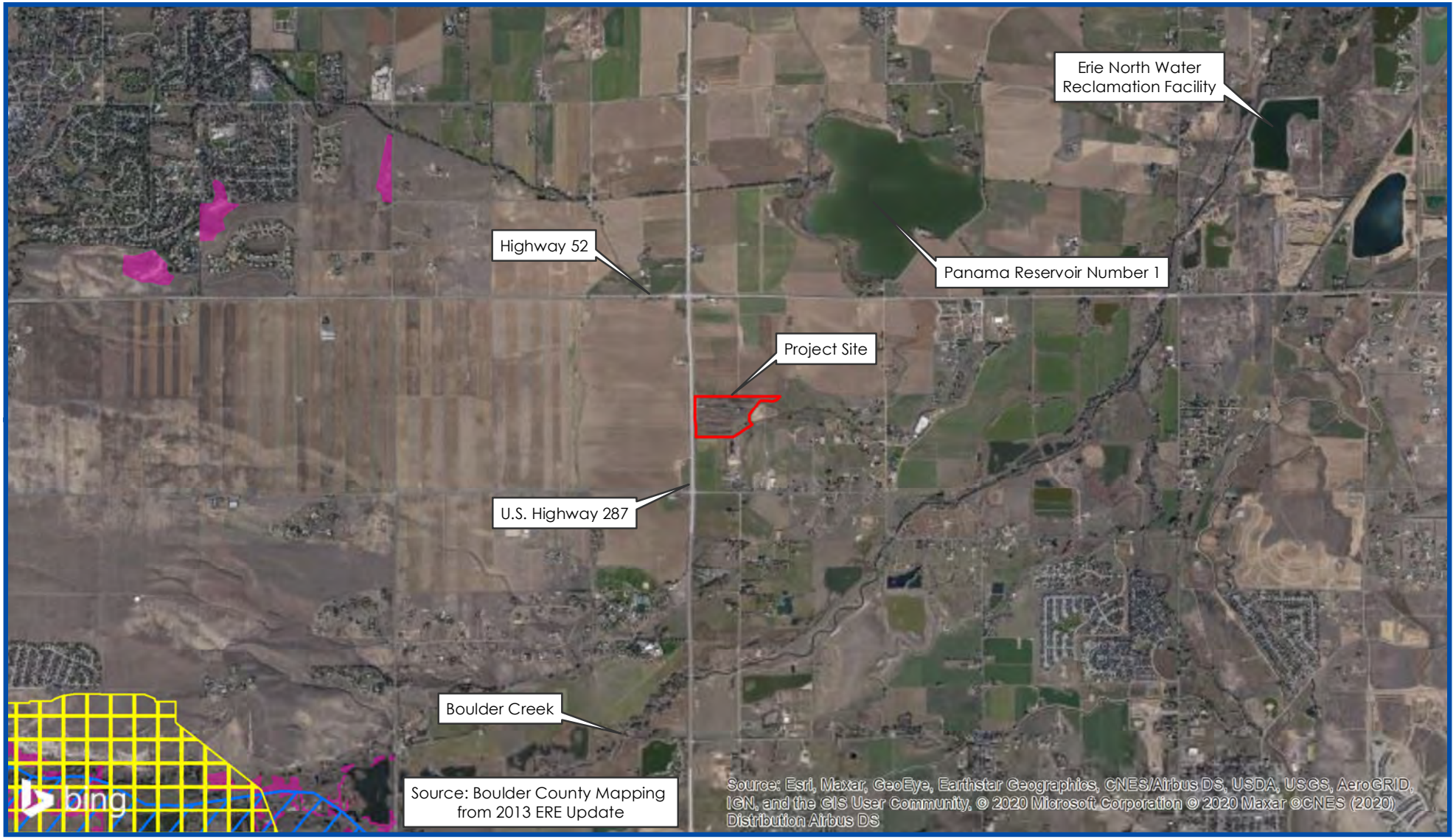

LEGEND

- Project Site
- Rare Plant Areas
- High Biodiversity Areas
- Significant Natural Communities

N

1:60,000

0 1,500 3,000 6,000

Feet

Figure 7. Natural Communities Map
Boulder County Compost Processing Facility

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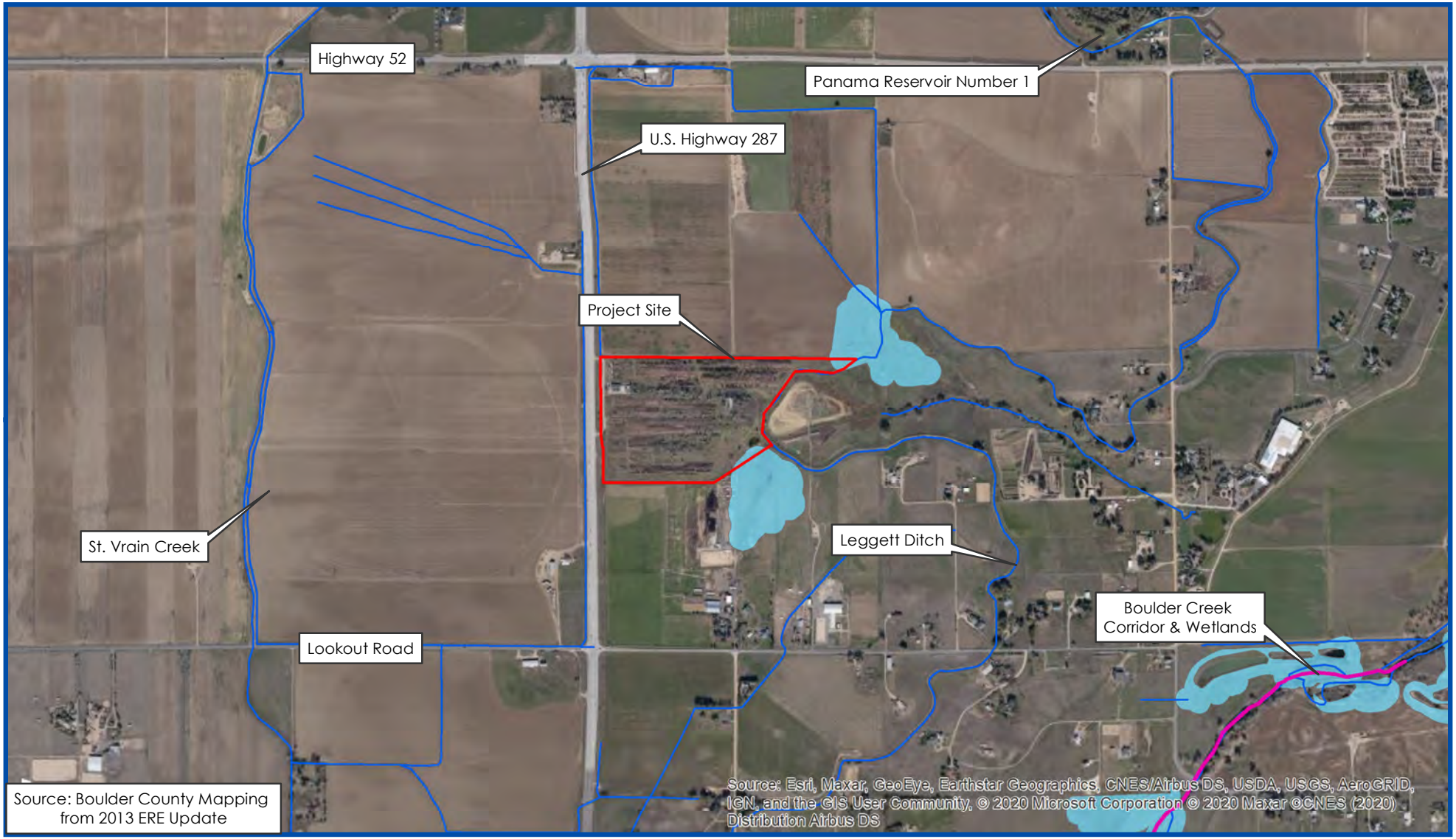

LEGEND

- Project Site
- Riparian Habitat Connectors
- Streams and Ditches
- Boulder County Wetlands

N

1:20,000

0 500 1,000 2,000

Feet

Figure 8. Boulder County Wetland Habitat Map
Boulder County Compost Processing Facility

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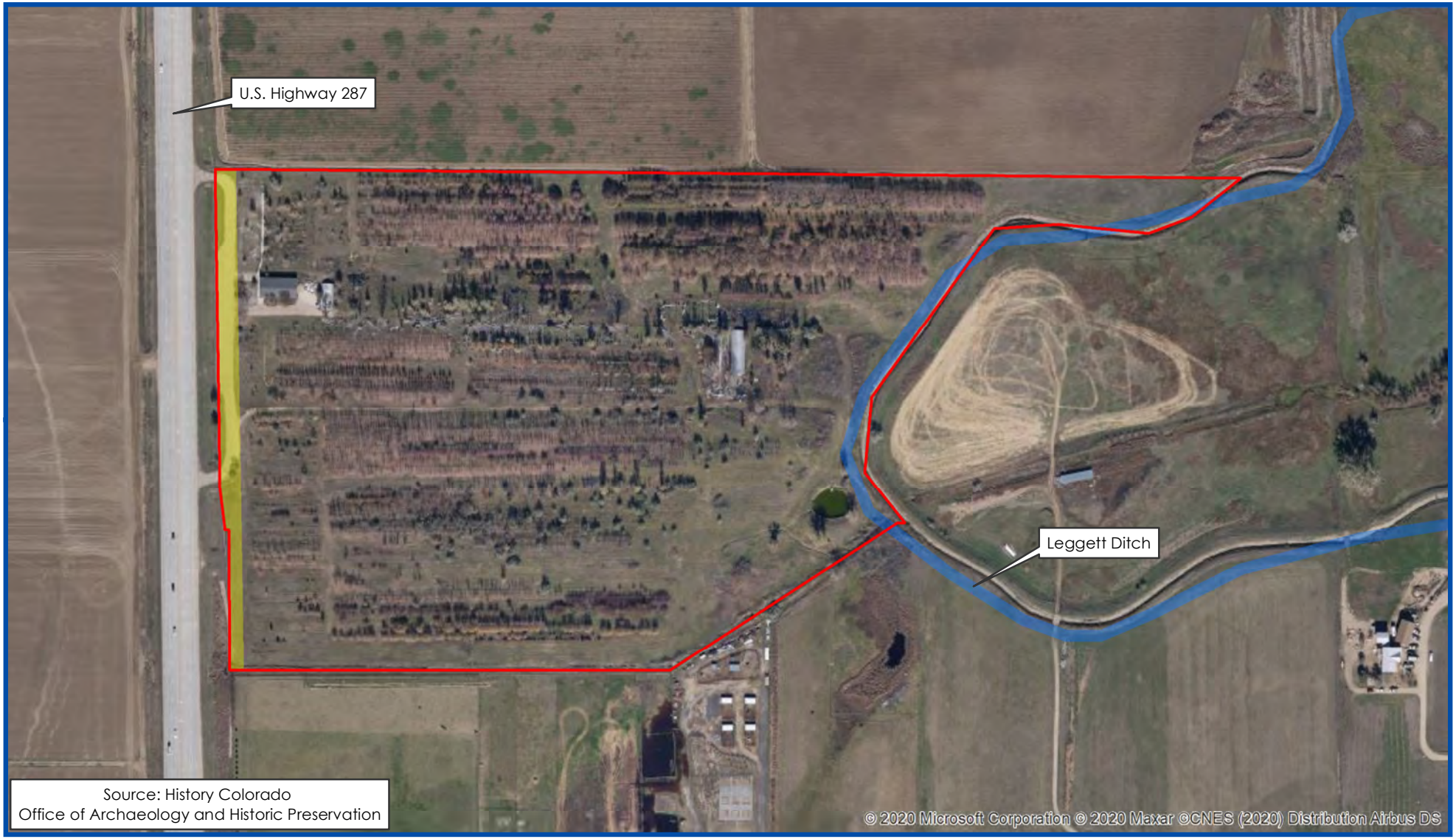

LEGEND

- Project Site
- Cultural Resource Site
- Historical Survey Site

N

1:5,000

0 125 250 500

Feet

Figure 9. Cultural Resources Map
Boulder County Compost Processing Facility

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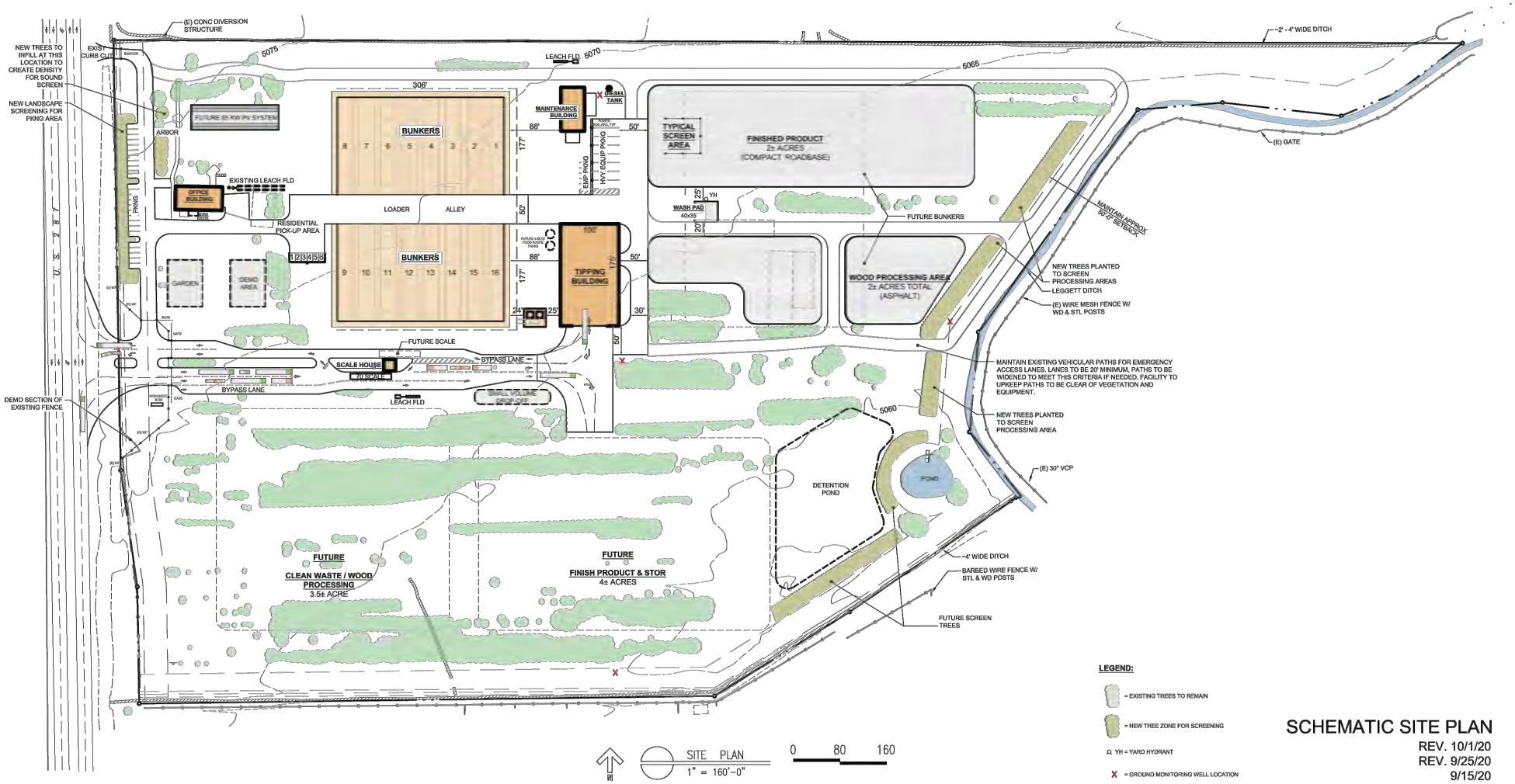

SCHEMATIC SITE PLAN
REV. 10/1/20
REV. 9/25/20
9/15/20

SCS ENGINEERS

BOULDER COUNTY COMPOST PROCESSING FACILITY

5762 N 107th St Longmont, CO 80504

pch ARCHITECTS
BOULDER, COLORADO

Figure 10. Schematic Site Plan
Boulder County Compost Processing Facility

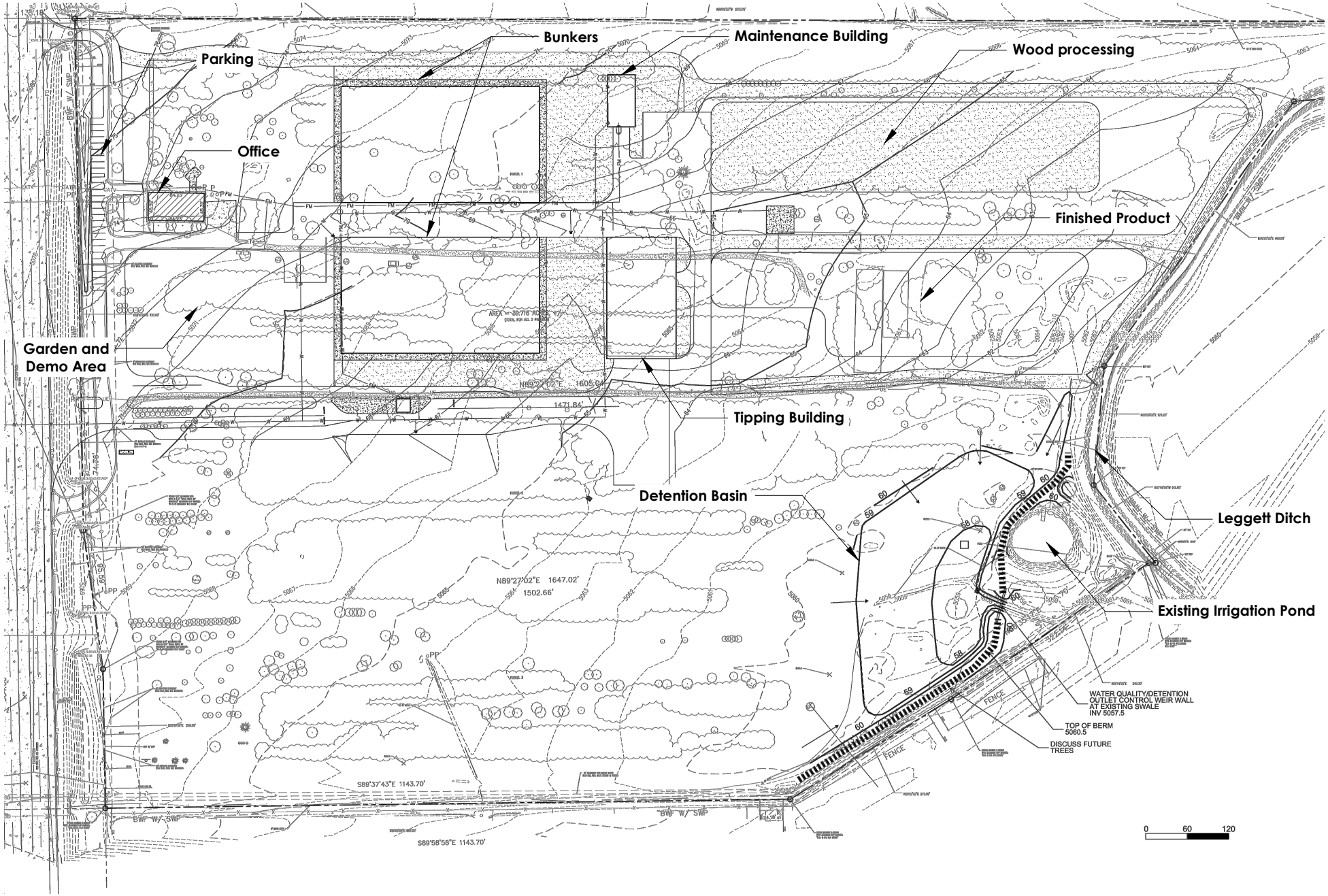

Figure 12. Detention and Water Quality Grading Plan
Boulder County Compost Processing Facility

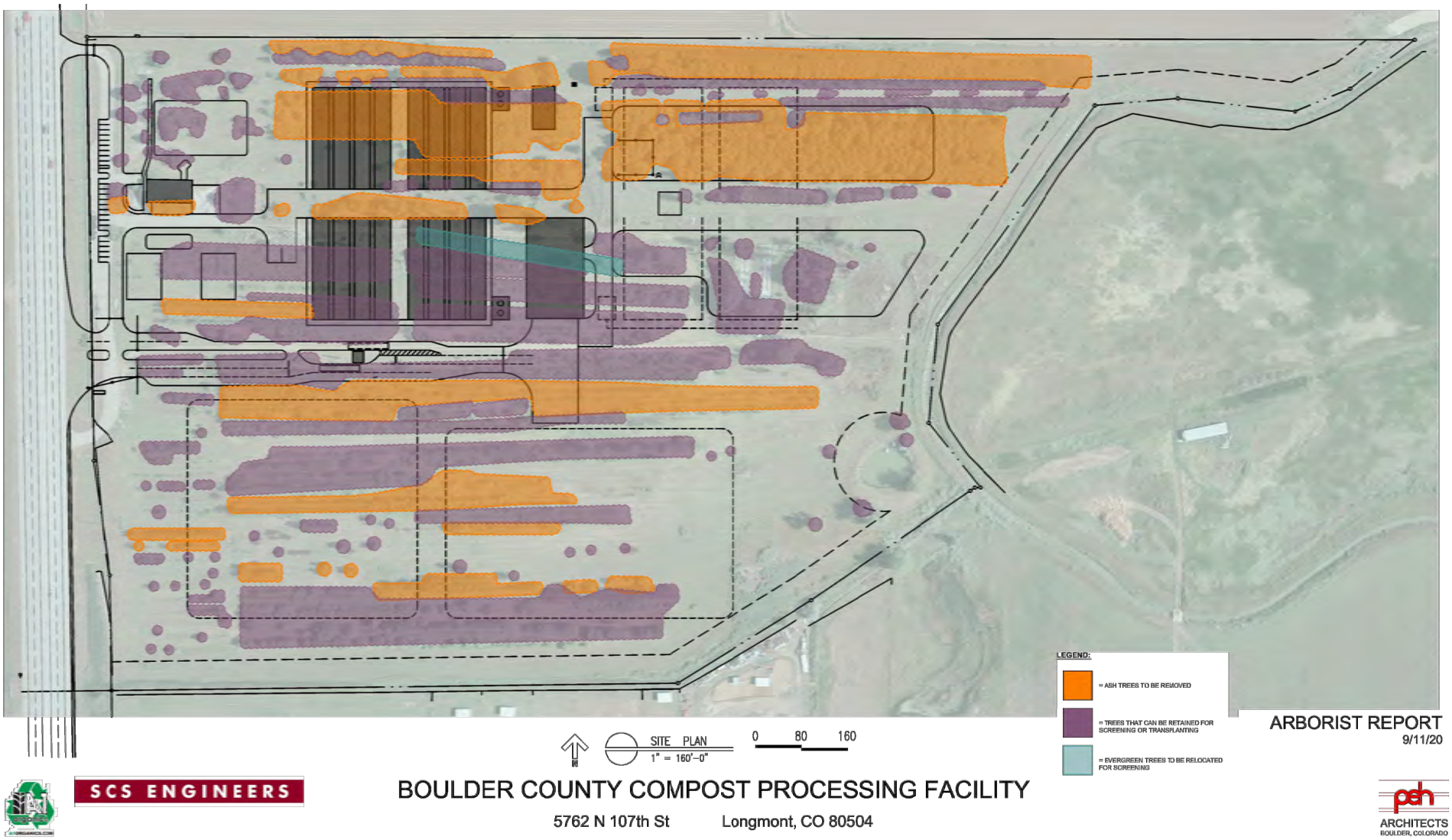

Figure 12. Arborist Report
Boulder County Compost Processing Facility

10.0 TABLES

TABLE 1
Vascular Plant Species List
Boulder County Compost Facility

Scientific Name	Common Name	Family	Origin*
Trees			
Acer × freemanii	Autumn blaze maple	Sapindaceae	I
Elaeagnus angustifolia	Russian olive	Eleangnaceae	I+
Fraxinus pensylvanica	Green Ash	Oleaceae	I
Gleditsia tricanthos	Honeylocust	Fabaceae	I
Malus sp.	Crabapple	Rosaceae	I
Picea pungens	Blue spruce	Pinaceae	N
Populus angustifolia	Narrowleaf cottonwood	Salicaceae	N
Populus deltoides	Plains cottonwood	Salicaceae	N
Populus tremuloides	Aspen	Salicaceae	N
Salix amygdaloides	Peachleaf willow	Salicaceae	N
Tilia sp.	Linden	Tiliaceae	I
Ulmus pumila	Siberian elm	Ulmaceae	I
Shrubs			
Celtis reticulata	Netleaf hackberry	Ulmaceae	N
Crataegus sp.	English hawthorn		
Ephedra sp.	Mormon tea	Ephedraceae	N
Lonicera	Honeysuckle		
Prunus virginiana var. melanocarpa	Choke cherry	Rosaceae	N
Prunus virginiana 'Schubert'	Schubert choke cherry	Rosaceae	I
Rhus trilobata	Skunk brush	Anacardiaceae	N
Salix exigua	Sandbar willow	Salicaceae	N
Tamarix parviflora	Salt cedar	Tamaricaceae	I+
Perennial Graminoids			
Bromus inermis	Smooth brome	Poaceae	I
Carex emoryi	Emory sedge	Cyperaceae	N
Elytrigia repens (Elymus)	Quackgrass	Poaceae	I+
Festuca pratensis	Meadow fescue	Poaceae	I
Phalaris arundinacea	Reed Canarygrass	Poaceae	I
Scirpus acutus	Hardstem bulrush	Cyperaceae	N
Typha angustifolia	Narrowleaf cattail	Typhaceae	N

TABLE 1
Vascular Plant Species List
Boulder County Compost Facility

Scientific Name	Common Name	Family	Origin*
Perennial Forbs			
Ambrosia psilostachya	Naked spike ragweed	Asteraceae	N
Asclepias speciosa	Showy milkweed	Asclepiadaceae	N
Asparagus officinalis	Asparagus	Liliaceae	I
Aster ericoides var. ericoides	White heath aster	Asteraceae	N
Cirsium arvense	Canada thistle	Asteraceae	I+
Convolvulus arvensis	Field bindweed	Convolvulaceae	I+
Daucus carota	Wild carrot	Apiaceae	I
Grindelia squarrosa	Gumweed	Asteraceae	N
Malva neglecta	Common mallow	Malvaceae	I
Medicago sativa	Alfalfa	Fabaceae	I
Plantago lanceolata	English plantain	Plantaginaceae	I
Rumex crispus	Curly dock	Polygonaceae	I
Taraxacum officinale	Dandelion	Asteraceae	I
Annual/Biennial Graminoids			
Bromus japonicus	Japanese brome	Poaceae	I
Bromus tectorum	Cheatgrass	Poaceae	I+
Annual/Biennial Forbs			
Ambrosia trifida	Giant ragweed	Asteraceae	I
Bassia hyssopifolia	Smotherweed	Chenopodiaceae	I
Carduus nutans ssp. macrolepis	Musk thistle	Asteraceae	I+
Dipsacus fullonum ssp. sylvestris	Teasel	Dipsacaceae	I+
Helianthus annuus	Common sunflower	Asteraceae	N
Helianthus petiolaris	Plains sunflower	Asteraceae	N
Kochia scoparia	Kochia	Chenopodiaceae	I
Lactuca serriola	Prickly lettuce	Asteraceae	I
Melilotus albus	White sweet clover	Fabaceae	I
Melilotus officinalis	Yellow sweet clover	Fabaceae	I
Poinsettia dentata	Toothed spurge	Euphorbiaceae	N
Salsola australis (S. iberica)	Russian thistle	Chenopodiaceae	I
Verbascum thapsus	Great mullein	Scrophulariaceae	I+

***** Origin: N = Native; I = Introduced; I+ = Colorado State-Listed Noxious Weed

** Wetland Status: OBL = Obligate Wetland; FACW = Facultative Wetland; FAC = Facultative; FACU = Facultative Upland; UPL = Obligate Upland; NL = No Status in this Region

Appendix A of Colorado's Statewide Wildlife Action Plan includes 117 species of Colorado's most imperiled plant species. Of these, ten species are known to occur in Boulder County. The habitat and potential occurrence of these species is summarized in Table 2 below:

TABLE 2
Colorado Statewide Wildlife Action Plan Rare Plant Species of Boulder County

Scientific Name	Common Name	Habitat Description	Potential to Occur in Project Area
Aletes humilus	Larimer aletes	Montane forests, commonly on N or W facing slopes, in crevices and cracks of rock outcrops, soils derived from granite, occasionally in forest duff of open Ponderosa pine-Douglas fir forests; 6,500 - 8,700 ft	No suitable habitat
Astragalus sparsiflorus	Front Range milkvetch	Evergreen forests, dry gravelly banks, meadows, open hillsides and sandy canyon bottoms, sometimes on road cuts or natural talus; 5,469 - 9,970 ft	No suitable habitat
Botrychium lineare	Narrow leaf grape fern	Varied habitats - mostly at higher elevations in the mountains, but specific habitats have ranged from a meadow dominated by knee-high grass, shaded woods and woodlands, grassy horizontal ledges on a north-facing limestone cliff, and a flat upland section of a river valley; 3,800 - 11,700 ft. Flora of Colorado (Ackerfield, 2015) treats *Botrychium lineare* as *Botrychium campestre ssp. lineare,* and states that the	No suitable habitat

TABLE 2
Colorado Statewide Wildlife Action Plan Rare Plant Species of Boulder County

Scientific Name	Common Name	Habitat Description	Potential to Occur in Project Area
		habitat is open subalpine slopes along the Continental Divide and near Bonny Reservoir on the eastern plains.	
Castilleja puberula	Downy Indian paintbrush	Rocky tundra and high peaks of the Continental Divide; 10,725 - 13,018 ft	No suitable habitat
Draba exunguiculata	Clawless draba	Rocky, gravelly slopes and talus, fellfields, usually granitic bedrock; 12,000 - 14,000 ft	No suitable habitat
Gaura neomexicana ssp. coloradensis (Oenothera)	Colorado butterfly plant	Sub-irrigated, alluvial soils of drainage bottoms surrounded by mixed grass prairie; 4,859 - 6,378 ft	No suitable habitat
Mimulus gemmiparus	Budding monkey flower	Subalpine species found on granite outcrops with surface seepage water, moist forest soils near seeps and springs; 8,359 - 11,201 ft	No suitable habitat
Physaria bellii	Bell's twinpod	Front Range foothills, often in shale and limestone soils of the Fountain/Ingleside, Lykins, Niobrara, and Pierre formations. This species is found in association with grassland and shrubland habitats, in rocky areas and road cuts; 5,089 - 6,552 ft	No suitable habitat

TABLE 2
Colorado Statewide Wildlife Action Plan Rare Plant Species of Boulder County

Scientific Name	Common Name	Habitat Description	Potential to Occur in Project Area
Potentilla rupincola	Rocky Mountain cinquefoil	Granitic outcrops or thin, gravelly granitic soils with west or north exposure, often with ponderosa pine or limber pine; 6,900 - 10,500 ft	No suitable habitat
Spiranthes diluvialis	Ute ladies' tresses orchid	Subirrigated alluvial soils along streams and in open meadows in floodplains; 4,528 - 7,753 ft	No suitable habitat

TABLE 3
IPAC Federally Listed & Proposed Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Status	Habitat Requirements	Potential for Occurrence
Fishes			
Greenback Cutthroat Trout *(Oncorhynchus clarki stomias)*	FT	High altitude mountain streams with no non-native salmonids.	None – Suitable habitat not present.
Pallid Sturgeon *(Scaphirhynchus albus)*	FE	Lower reaches of the Platte River and upper Missouri River.	None – Suitable habitat not present.
Birds			
Least Tern (interior population) *(Sterna antillarum)*	FE	Rivers with broad exposed sand bars.	None – Suitable habitat not present. The project will not cause water depletions to the South Platte River System.
Mexican Spotted Owl *(Strix occidentalis lucida)*	FT	Narrow rocky canyons with trees.	None – Suitable habitat not present.
Piping Plover *(Charadrius melodus)*	FT	Open ground away from water, often on broad exposed sand bars.	None – Suitable habitat not present. The project will not cause water depletions to the South Platte River System.
Whooping Crane *(Grus americana)*	FE	Muskeg, prairie pools, marshes.	None – Suitable habitat not present. The project will not cause water depletions to the South Platte River System.
Mammals			
Canada Lynx *(Lynx Canadensis)*	FT	High altitude spruce-fir forests.	None – Suitable habitat not present.
Preble's Meadow Jumping Mouse *(Zapus hudsonious preblei)*	FT	Riparian areas with lush vegetation.	None – Suitable habitat not present.

FE = Federally Endangered; FT = Federally Threatened; PT = Proposed Threatened

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Fish			
Arkansas Darter *(Etheostoma cragini)*	ST	Found only in tributaries of the Arkansas River.	No suitable habitat
Bonytail *(Gila elegans)*	FE, SE	Found in the main stem and tributaries of the Colorado River.	No suitable habitat
Brassy Minnow *(Hybognathus hankinsoni)*	ST	Found in S. Platte and Republican Rivers.	No suitable habitat
Colorado Pikeminnow *(Ptychocheilus lucius)*	FE, ST	Found in the main stem and tributaries of the Colorado River.	No suitable habitat
Colorado River Cutthroat Trout *(Oncorhynchus clarki pleuriticus)*	SC	Found in the Colorado River Basin.	No suitable habitat
Colorado Roundtail Chub *(Gila robusta)*	SC	A large river fish found in western Colorado.	No suitable habitat
Common Shiner *(Luxilus cornutus)*	ST	Found in tributary streams of the S. Platte River.	No suitable habitat
Flathead Chub *(Platygobio gracilus)*	SC	Found in mainstems of turbid streams and rivers.	No suitable habitat
Greenback Cutthroat Trout *(Oncorhynchus clarki stomias)*	FT, ST	High altitude mountain streams with no non-native salmonids.	No suitable habitat
Humpback Chub *(Gila cypha)*	FE, ST	Found in the main stem and tributaries of the Colorado River.	No suitable habitat
Iowa Darter *(Etheostoma exile)*	SC	Found in some plains streams in northeastern Colorado.	No suitable habitat
Lake Chub *(Couesius plumbeus)*	SE	Extirpated in Colorado (Woodling 1985).	No suitable habitat
Mountain Sucker *(Catostomus playtrhynchus)*	SC	Found in smaller rivers and streams in northwestern Colorado.	No suitable habitat
Northern Redbelly Dace *(Phoxinus eos)*	SE	Upper reach tributaries of the S. Platte and Platte River.	No suitable habitat

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Plains Minnow *(Hybognathus placitus)*	SE	Prefer main channel areas with some current and sandy bottoms. Found in eastern Colorado.	No suitable habitat
Plains Orangethroat Darter *(Etheostoma spectabile)*	SC	Found in small streams of the Republican Basin.	No suitable habitat
Razorback Sucker *(Xyrauchen texanus)*	FE, SE	Found in the main stem and tributaries of the Colorado River.	No suitable habitat
Rio Grande Chub *(Gila pandora)*	SC	Restricted to the Rio Grande Basin in Colorado.	No suitable habitat
Rio Grande Cutthroat Trout *(Oncorhynchus clarki virginalis)*	SC	Restricted to the Rio Grande Basin in Colorado.	No suitable habitat
Rio Grande Sucker *(Catostomus plebeius)*	SE	Restricted to the Rio Grande Basin in southern Colorado.	No suitable habitat
Southern Redbelly Dace *(Phoxinus erythrogaster)*	SE	One population known in Arkansas River tributary.	No suitable habitat
Stonecat *(Noturus flavus)*	SC	Found in fast water riffles and runs of streams.	No suitable habitat
Suckermouth Minnow *(Phenacobius mirabilis)*	SE	Found in riffle areas of warm prairie streams of all sizes.	No suitable habitat
Birds			
American Peregrine Falcon *(Falco peregrinus anatum)*	SC	Nests on ledges of high cliffs.	No suitable habitat
Bald Eagle *(Haliaeetus leucocephalus)*	SC	Large, mature cottonwoods or pines near large water bodies.	Likely opportunistically forages over the Project site.
Burrowing Owl *(Athene cunicularia)*	ST	Nest in rodent burrows in grasslands, shrublands, deserts, and grassy urban areas (golf courses).	No suitable habitat
Columbian Sharp-Tailed Grouse *(Tympanuchus phasianellus columbianus)*	SC	Sagebrush shrublands.	No suitable habitat

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Ferruginous Hawk *(Buteo regalis)*	SC	Vast expanses of ungrazed or lightly grazed grassland and shrubland and shortgrass prairie.	No suitable habitat
Greater Sage-Grouse *(Centrocercus urophasianus)*	SC	Sagebrush shrublands in northwestern Colorado.	No suitable habitat
Greater Sandhill Crane *(Grus canadensis tabida)*	SC	Breed in wetland habitats, particularly flooded fields and beaver ponds.	No suitable habitat
Gunnison Sage-Grouse *(Centrocercus minimus)*	SC	Sage communities in the Gunnison Basin.	No suitable habitat
Lesser Prairie-Chicken *(Tympanuchus pallidicinctus)*	ST	Optimal habitat is midgrass to tallgrass prairie for nests and winter cover.	No suitable habitat
Long-Billed Curlew *(Numenius americanus)*	SC	Shortgrass prairie.	No suitable habitat
Mountain Plover *(Charadrius montanus)*	SC	Grazed shortgrass prairie and fallow fields.	No suitable habitat
Plains Sharp-Tailed Grouse *(Tympanuchus phasianellus jamesii)*	SE	Rolling hills with scrub oak thickets and grassy glades.	No suitable habitat
Western Snowy Plover *(Charadrius alexandrines)*	SC	Sandy open beaches, dry salt flats, dredge spoils, and river bars.	No suitable habitat
Western Yellow-billed Cuckoo *(Coccyzus americanus)*	SC	Found along major river drainages.	No suitable habitat
Mammals			
Black-footed Ferret *(Mustela nigripes)*	FE, SE	Large (>50 acres) prairie dog colonies.	No suitable habitat
Black-tailed Prairie Dog *(Cynomys ludovicianus)*	SC	Open prairie grasslands, disturbed areas, fallow and mowed agriculture fields.	None present
Botta's Pocket Gopher *(Thomomys bottae rubidus)*	SC	Occur in southern Colorado.	No suitable habitat

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Gray Wolf *(Canis lupus)*	FE, SE	Believed to be extirpated in Colorado; but some sporadic migrations from Yellowstone have occurred	No suitable habitat
Grizzly Bear *(Ursus arctos)*	FT, SE	Believed to be extirpated in Colorado.	No suitable habitat
Kit Fox *(Vulpes macrotis)*	SE	Deserts of the Southwest.	No suitable habitat
Lynx *(Lynx canadensis)*	FT, SE	High altitude spruce-fir forests.	No suitable habitat
Northern Pocket Gopher *(Thomomys talpoides macrotis)*	SC	Many habitat types including agricultural lands, pasture lands, semidesert shrublands, and grasslands.	No evidence (i.e. mounding) of their presence was noted during site visit.
Preble's Meadow Jumping Mouse *(Zapus hudsonius preblei)*	FT, ST	Riparian areas with lush vegetation.	No suitable habitat
River Otter *(Lontra canadensis)*	ST	Large waterways throughout Colorado.	No suitable habitat
Swift Fox *(Vulpes velox)*	SC	Short and mid-grass prairies of the Great Plains.	No suitable habitat
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	SC	Occupies semidesert shrublands, pinon-juniper woodlands, and open montane forests.	No suitable habitat
Wolverine *(Gulo gulo)*	SE	Alpine, subalpine, and high-altitude forests with little to no human intrusion.	No suitable habitat
Amphibians/Reptiles			
Boreal Toad *(Bufo boreas boreas)*	SE	High altitude wetlands, ponds, etc.	No suitable habitat
Couch's Spadefoot *(Scaphiopus couchii)*	SC	Eastern Colorado plains.	No suitable habitat

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Great Plains Narrowmouth Toad *(Gastrophryne olivacea)*	SC	Extreme southeastern Colorado.	No suitable habitat
Northern Cricket Frog *(Acris crepitans)*	SC	Found in Yuma, Weld and Morgan Counties at elevations between 3,500–3,600 feet.	No suitable habitat
Northern Leopard Frog *(Rana pipiens)*	SC	Wet meadows and the banks of and shallows of marshes, ponds, lakes, streams, irrigation ditches.	Possible in the Leggett Ditch. Often locally extirpated; cannot compete with the wide-spread and invasive Bull Frog (*Lithobates catesbeianus*).
Plains Leopard Frog *(Rana blairi)*	SC	Eastern Colorado and southeastern Colorado.	No suitable habitat
Wood Frog *(Rana sylvatica)*	SC	Found in Colorado in mountain forests in Jackson and Larimer Counties only.	No suitable habitat
Triploid Checkered Whiptail *(Cnemidophorus neotesselatus)*	SC	Foothills of the Rocky Mountains in Fremont County eastward to Pueblo and Stone City in Pueblo County.	No suitable habitat
Midget Faded Rattlesnake *(Crotalus viridis concolor)*	SC	Desert lands in northwestern Colorado.	No suitable habitat
Longnose Leopard Lizard *(Gambelia wislizenii)*	SC	Occurs in west-central Colorado and extreme southwestern Colorado.	No suitable habitat
Yellow Mud Turtle *(Kinosternon flavescens)*	SC	Occurs in eastern Colorado.	No suitable habitat
Common King Snake *(Lampropeltis getula)*	SC	Occurs in southwestern and southeastern Colorado.	No suitable habitat
Texas Blind Snake *(Leptotyphlops dulcis)*	SC	Occurs in extreme southeastern Colorado.	No suitable habitat
Texas Horned Lizard *(Phrynosoma cornutum)*	SC	Occurs in southeastern Colorado.	No suitable habitat

TABLE 4
Colorado Parks and Wildlife
Endangered, Threatened & Wildlife Species of Special Concern
Boulder County Compost Processing Facility

Species	Status*	Habitat Requirements	Potential for Occurrence
Roundtail Horned Lizard *(Phrynosoma modestum)*	SC	Occurs in extreme northwestern Otero County.	No suitable habitat
Massasauga *(Sistrurus catenatus)*	SC	Occurs in shortgrass prairie habitats in southeastern Colorado.	No suitable habitat
Common Garter Snake *(Thamnophis sirtalis)*	SC	Restricted to aquatic, wetland and riparian habitats at elevations below 6,000 feet: seldom found at isolated ponds.	Possible; suitable habitat present along Leggett Ditch.

*SE = State Endangered. ST = State Threatened. SC = State Special Concern (not a statutory category).

FE = Federally Endangered; FT = Federally Threatened; PT = Proposed Threatened

TABLE 5
IPaC Migratory Birds of Conservation Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Bald Eagle *(Haliaeetus leucocephalus)*	Areas along rivers or lakes with large trees for nesting and roosting.	Likely opportunistically forages over the Project site. No nests are present on site and no trees on site are large enough to support a Bald Eagle nest.
Burrowing Owl *(Athene cunicularia)*	Nest in rodent burrows in grasslands, shrublands, deserts, and grassy urban areas (golf courses).	No potential for occurrence
Golden Eagle *(Aquila chrysaetos)*	Golden Eagles live in open and semi-open country featuring native vegetation; they avoid developed areas and uninterrupted stretches of forest. Golden Eagles nest on cliffs and steep escarpments in grassland, chapparal, shrubland, forest, and other vegetated areas.	No potential for occurrence
Lark Bunting *(Calamospiza melanocorys)*	Grasslands and agricultural areas, mostly associated with the eastern plains.	No potential for occurrence
Lesser Yellowlegs *(Tringa flavipes)*	Breeds only in Alaska through Quebec.	No potential for occurrence
Long-Billed Curlew *(Numenius americanus)*	Expansive blocks of native shortgrass prairie.	No potential for occurrence
Mccown's Longspur *(Calcarius mccownii)*	Endemic to the shortgrass prairie ecosystem; need heavily grazed cattle pastures with low density vegetation (Wickersham 2016).	No potential for occurrence
Semipalmated Sandpiper *(Calidris pusilla)*	Breeds in sub-arctic tundra and overwinters along the coasts of South America. Migrates east of project site.	No potential for occurrence

TABLE 5
IPaC Migratory Birds of Conservation Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Willet *(Tringa semipalmata)*	In Colorado breeding is restricted to Jackson County and the San Luis Valley.	No potential for occurrence

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Fish		
Chub, Lake *Couesius plumbeus*	Extirpated in Colorado (Woodling 1985).	None – suitable habitat not present.
Darter, Iowa *Etheostoma exile*	Found in some plains streams in northeastern Colorado.	None – suitable habitat not present.
Darter, Johnny *Etheostoma nigrum*	Found in isolated portions of the South Platte River Basin in waters between 6-18 inches deep with a moderate current and a sand and rubble substrate.	None – suitable habitat not present.
Minnow, Brassy *Hybognathus hankinsoni*	In Colorado found in low numbers in the South Platte and Republican River Basins. Woodling (1985) reported only populations associated with South Platte were in the lower St. Vrain River and Spottlewood Creek.	None – suitable habitat not present.
Shiner, Bigmouth *Notropis dorsalis*	In large rivers including the South Platte and smaller permanently flowing tributaries.	None – suitable habitat not present.
Shiner, Common *Luxilus cornutus*	Found in tributary streams of the S. Platte River.	None – suitable habitat not present.
Stonecat *Noturus flavus*	Found in fast water riffles and runs of streams.	None – suitable habitat not present.
Topminnow, Plains *Fundulus sciadicus*	Found in isolated colonies in cool, foothills streams, intermittent plains streams and the lower mainstem South Platte River in waters where there is abundant filamentous algal growth and still, clear water (Woodling 1985).	None – suitable habitat not present.
Trout, Greenback Cutthroat *Oncorhynchus clarki stomias*	High altitude mountain streams with no non-native salmonids.	None – suitable habitat not present; below elevational range.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Birds		
Avocet, American *Recurvirostra americana*	Breed in emergent wetland habitats with open shorelines, mudflats, and shallow water with little vegetation for foraging.	None – suitable habitat not present.
Bittern, American *Botaurus lentiginosus*	Large (9 – 24 acres) wetland marshes dominated by cattails with interspersed open water.	None – suitable habitat not present.
Bittern, Least *Ixobrychus exilis*	Extremely rare breeder in Colorado. Require dense cattail marshes for breeding.	None – suitable habitat not present.
Blackbird, Yellow-headed *Xanthocephalus xanthocephalus*	Nest exclusively in deep-water marshes with abundant robust emergent vegetation (including *Typha* spp). Forage in grasslands and agricultural fields.	None – suitable habitat not present.
Bobolink *Dolichonyx oryzivorus*	Breed in tall-grass meadows and flooded irrigated hay fields; need large habitat patches with interiors greater than 200m from an edge.	None – suitable habitat not present. Bobolink only breed in tall-grass areas (in Boulder County this includes grass hay fields of sufficient height and size)
Bunting, Indigo *Passerina cyenea*	Typically avoid urban/suburban areas. Favor riparian habitats for breeding most often associated with low elevation shrublands or montane shrublands/oak scrub.	None – suitable habitat not present.
Bunting, Lazuli *Passerina amoena*	Breed in shrubby habitats, most often in riparian forest or carr (most breeding in Colorado occurs between 5,500 and 7,000 feet elevation) and montane shrublands or scrub oak.	None – suitable habitat not present.
Bushtit *Psatlriparus minimus*	Prefer open, mixed woodlands with some evergreen foliage or shrubby understory. Reside primarily in pinyon-juniper woodlands and shrublands.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Cormorant, Double-crested *Phalacrocorax auritus*	Breed colonially on islands in lakes or in cottonwoods along streams and shorelines of reservoirs and riparian areas near water with abundant fish populations.	None – suitable habitat not present.
Crossbill, White-winged *Loxia leucoptera*	Boreal forests; predominantly use spruce-fir.	None – suitable habitat not present.
Dipper, American *Cinclus mexicanus*	Require fast-moving, clear, unpolluted streams with cascades, riffles, and waterfalls.	None – suitable habitat not present.
Duck, Ring-necked *Aythya collaris*	Nest along the vegetative edges of small openings in flooded emergent vegetation.	None – suitable habitat not present.
Duck, Wood *Aix sponsa*	Nest in cavities in large trees near or over water in riparian habitats.	None – suitable habitat not present.
Eagle, Bald *Haliaeetus leucocephalus*	Large, mature cottonwoods or pines near large water bodies.	Likely opportunistically forages over the Project site.
Eagle, Golden *Aquila chrysaetos*	Golden Eagles live in open and semi-open country featuring native vegetation across most of the Northern Hemisphere. They avoid developed areas and uninterrupted stretches of forest. They are found primarily in mountains up to 12,000 feet, canyonlands, rimrock terrain, and riverside cliffs and bluffs. Golden Eagles nest on cliffs and steep escarpments in grassland, chaparral, shrubland, forest, and other vegetated areas.	None – suitable habitat not present.
Egret, Great *Ardea alba*	Nests in trees colonially; feed in shallow water along the edges of rivers, ponds, etc.	None – suitable habitat not present.
Falcon, Peregrine *Falco peregrinus anatum*	Nests on ledges of high cliffs.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Falcon, Prairie *Falco mexicanus*	Nests on cliffs in open country at less than 10,000 feet altitude.	Non – suitable habitat not present.
Flicker, Northern *Colaptes auratus*	Need soft wood (i.e. dead or dying) in which to build cavities for nesting.	Confirmed Present
Flycatcher, Olive-sided *Contopus cooperi*	Boreal forests between 7,000 – 11,000 ft.	None – suitable habitat not present; below elevational range.
Flycatcher, Willow *Empidonax traillii*	Riparian thickets in the foothills and montane zones and willow-dominated open valleys and mountain parks – usually distant from trees.	None – suitable habitat not present.
Goshawk, Northern *Accipter gentilis*	Predominantly uses ponderosa pine, but will also use Douglas fir, various pines and aspens.	None – suitable habitat not present.
Grebe, Eared *Podiceps nigricollis*	Breed in lakes and emergent and submergent wetlands with shallow water. Colonial nesters.	None – suitable habitat not present at the building site.
Harrier, Northern *Circus cyaneus*	Spring & fall migrant in western valleys mountain parks, and eastern plains in CO inhabiting grasslands, agricultural areas, marshes & tundra in fall; 3,500 - 13,000 ft.	None - Suitable habitat not present on the building site but could utilize surrounding agricultural lands.
Hawk, Ferruginous *Buteo regalis*	Vast expanses of ungrazed or lightly grazed grassland and shrubland and shortgrass prairie.	None – suitable habitat not present.
Hawk, Rough-legged *Buteo lagopus*	Does not breed in Colorado.	None – suitable habitat not present.
Heron, Black-crowned Night *Nycticoras nycticorax*	Colonial nesting species.	None – suitable habitat not present.
Heron, Great Blue *Ardea herodias*	Colonial nesting species. Forage in all types of aquatic habitats.	None – suitable habitat not present at the building site but could utilize the pond.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Kingfisher, Belted *Megaceryle alycon*	Require open water, aquatic animals (i.e. fish and invertebrates), and near vertical banks for nesting.	None – suitable habitat not present at the building site but could utilize areas of the pond and ditches.
Kinglet, Golden-crowned *Regulus satrapa*	Most abundant in spruce-fir forests at altitudes between 7,600 and 11,600 feet.	None – suitable habitat not present; below elevational range.
Lark, Horned *Eremophila alpestris*	Breed in open, generally barren country where there is considerable bare ground and grasses no taller than a few centimeters.	None – suitable habitat not present.
Mockingbird, Northern *Mimus polyglottos*	Shrublands, suburban parks, edges of open woods, rural areas, and pastures.	Possible. Suitable nesting and foraging habitat present in trees.
Ovenbird *Seiurus aurocapilla*	In Colorado nesting occurs in foothills ponderosa pine communities with an understory of Gambel oak.	None – suitable habitat not present.
Owl, Boreal *Aegolius funereus*	Mature to old-age spruce-fir above 9,000 ft, after nesting may wander to open pinon-juniper and ponderosa pine.	None – suitable habitat not present; below elevational range.
Owl, Burrowing *Athene cunicularia*	Nest in rodent burrows in grasslands, shrublands, deserts, and grassy urban areas (golf courses).	None – no burrows present within project area.
Owl, Flammulated *Otus flammeolus*	Depend on cavities for nesting, open forests for catching insects, and brush or dense foliage for roosting at altitudes between 6,000 – 10,000 ft.	None – suitable habitat not present; below elevational range.
Owl, Long-eared *Asio otus*	Edge habitat that provides trees for nesting and open areas for foraging.	Possible. Suitable nesting and foraging habitat present in trees.
Owl, Mexican Spotted *Strix occidentalis*	Narrow rocky canyons with trees.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Owl, Northern Pygmy *Glaucidium gnoma*	In Colorado this species breeds primarily in ponderosa pine woodlands, aspen forests, and pinyon-juniper woodlands from the lower foothills to upper montane life zones.	None – suitable habitat not present.
Owl, Short-eared *Asio flammeus*	Require large expanses of ungrazed grasslands with dense vegetation.	None – suitable habitat not present.
Pigeon, Band-tailed *Patagioenas fasciata*	Primarily inhabit montane conifer or mixed-species forests dominated by pine and oak at 5,350 – 9,000 feet in altitude.	None – suitable habitat not present.
Ptarmigan, White-tailed *Lagopus leucura*	Alpine, but in the winter they may go as low as 8,000 ft. along streams lined by willows or alders.	None – suitable habitat not present; below elevational range.
Redstart, American *Setophaga ruticilla*	Riparian habitats including low-elevation and montane deciduous riparian forest and mid-elevation willow carr communities.	None – suitable habitat not present.
Rosy-finch, Brown-capped *Leucosticte austalis*	Nests above timberline in alpine zone in cliffs, crevices; also utilizes spruce-fir forest.	None – suitable habitat not present; below elevational range.
Scrub-Jay, Western *Aphelocoma californica*	Associated with 'scrub' – oak, pinyon-juniper, and brush.	None – suitable habitat not present.
Shrike, Loggerhead *Lanius ludovicianus*	Shortgrass prairie and rural habitat; open country with scattered trees and shrubs.	None – suitable habitat not present.
Siskin, Pine *Spinus pinus*	Breed in spruce-fir forests. In winter move to lower elevations in a multitude of habitats.	None – suitable habitat not present.
Sparrow, Brewer's *Spizella breweri*	Sagebrush shrublands.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Sparrow, Cassin's *Peucaea cassinii*	Heavily grazed grasslands of eastern Colorado where cholla cactus, yucca, rabbitbrush, or sand sage provides shrubby overstory (Wickersham 2016). Cactus and yucca essential for nest site.	None – suitable habitat not present.
Sparrow, Fox *Passerella iliaca*	Nest in dense cover near streams in mid or high-elevation willow carrs between 7,500 – 11,000 feet in altitude.	None – suitable habitat not present; below elevational range.
Sparrow, Grasshopper *Ammodramus savannarum*	Grasslands and prairie with patchy bare ground.	None – suitable habitat not present.
Swallow, Bank *Riparia riparia*	Nesting habitat requires vertical banks of soft sand, gravel, clay or mud.	None – suitable habitat not present.
Swift, Black *Cypseloides niger*	Nests behind or close to waterfalls and wet cliffs at altitudes between 6,645 and 11,680 feet.	None – suitable habitat not present; below elevational range.
Thrasher, Sage *Oreoscoptes montanus*	Considered sagebrush obligate, will also nest in arid shrublands including greasewood. Must have areas with large expanses of contiguous habitat.	None – suitable habitat not present.
Veery *Catharus fuscescens*	Dense riparian thickets, willow-riparian.	None – suitable habitat not present.
Vireo, Plumbeous *Vireo plumbeus*	In Colorado found mainly in pinyon-juniper or ponderosa pine woodlands but may also occur in cottonwood riparian areas close to the foothills.	None – suitable habitat not present.
Warbler, Virginia's *Oreothlypis virginiae*	In Colorado nesting habitat is dense shrublands and scrub forests on steep-sloped mesas, open ravines, and mountain valleys.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Warbler, Wilson's *Cardellina pusilla*	High-elevation subalpine riparian willow habitat.	None – suitable habitat not present; below elevational range.
Waxwing, Cedar *Bombycilla cedrorum*	Riparian habitats or habitats in which berries and fruits (including Russian Olive) are available year-round.	None – suitable habitat not present.
Woodpecker, American Three-toed *Picoides dorsalis*	Inhabit boreal and montane forests where mature or old-growth trees provide habitat for wood boring insects.	None – suitable habitat not present.
Woodpecker, Lewis's *Melanerpes lewis*	Open pine forests, burnt-over areas with abundant snags and stumps, riparian and rural cottonwoods, and pinon-juniper woodlands.	None – suitable habitat not present.
Woodpecker, Red-headed *Melanerpes erythrocephalus*	Need openings with large-diameter snags and trees with substantial dead limbs.	None – suitable habitat not present.
Wren, Rock *Salpinctes obsoletus*	Nearly always found in the vicinity of cliffs, rocky outcrops, talus slopes, scattered boulders, eroded banks, badlands, or manmade structures (e.g. rock dams).	None – suitable habitat not present.
Mammals		
Badger, American *Taxidea taxus*	Found throughout Colorado in open habitats and avoid densely wooded areas. Most common in areas with abundant populations of ground squirrels, prairie dogs, and pocket gophers.	None – suitable habitat not present, lack of adequate prey base.
Bat, Big Brown *Eptesicus fuscus*	Found in almost every habitat.	Possible. Could forage over the project site.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Bat, Brazilian Free-tailed *Tadarida brasiliensis*	Occurs in pinon-juniper woodlands, arid grasslands and semidesert shrublands in the southwest. Only one occurrence known along Front Range – in mountains west of Boulder.	None – suitable habitat not present.
Bat, Eastern Red *Lasiurus borealis*	Tree roosting species.	Possible. Could forage over the project site
Bat, Hoary *Lasiurus cinereus*	Generally a solitary species. In Colorado, the species is frequently detected in ponderosa pine forests where large deciduous trees are lacking. Can occur in any appropriate treed habitat.	None – suitable habitat not present.
Bat, Silver-haired *Lasionycteris nactivagans*	Widespread tree roosting species.	Possible. Could forage over the project site.
Bat, Townsend's Big-eared *Corynorhinus townsendii*	Occupies semidesert shrublands, pinon-juniper woodlands, and open montane forests.	None – suitable habitat not present.
Bat, Tricolored *Perimyotis subflavus*	A bat of open woodlands; forages over water or along the edges of openings.	Possible. Could forage over the project site.
Beaver, North American *Castor canadensis*	Rivers and streams throughout Colorado.	None – suitable habitat not present.
Chipmunk, Uinta *Neotamias umbrinus*	Occur along the Front Range most commonly in higher-elevation montane forests between 6,500 and 12,000 feet in elevation.	None – suitable habitat not present.
Fox, Gray *Urocyon cinereoargenteus*	Rough broken terrain in semidesert shrublands, lower montane shrublands, pinyon-juniper and riparian woodlands, orchards, and weedy margins of croplands. Does not occupy intensive agricultural lands.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Gopher, Northern Pocket *Thomomys talpoides macrotis*	Many habitat types including agricultural lands, pasture lands, semidesert shrublands, and grasslands.	No evidence (i.e. mounding) observed within project area.
Jackrabbit, White-tailed *Lepus townsendii*	Needs open country with native vegetation, notably blue grama-buffalograss prairie.	None – suitable habitat not present.
Lynx, Canada *Lynx canadensis*	High altitude spruce-fir forests.	None – suitable habitat not present; below elevational range.
Marten, American *Martes americana*	Subalpine spruce-fir and lodgepole pine forests, alpine tundra and occasionally montane forests.	None – suitable habitat not present; below elevational range.
Mink, American *Neovison vison*	Riparian obligate species.	Possible -- suitable habitat present along Leggett Ditch.
Mouse, Northern Grasshopper *Onychomys leucogaster*	Semiarid grasslands, sand hills, open semidesert shrublands, and overgrazed rangelands that have sandy areas and high populations of insects.	None – suitable habitat not present.
Mouse, Northern Rock *Peromyscus nasutus*	Rocky canyons, cliffs, cuestas, and exposed hogbacks that provide numerous cracks fissures, and overhanging ledges.	None – suitable habitat not present.
Mouse, Olive-backed Pocket *Perognathus fasciatus*	Mixed prairie and shrub-steppe; may prefer sites with loamy sand to clay soils and low vegetative cover, often with large amount of bare ground. Plant associations include blue grama, needlegrass, and wheatgrass.	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Mouse, Plains Harvest *Reithrodontomys montanus*	Favors well-developed grass and forb cover of low or moderate height with scattered rocks. Found in grazed and ungrazed grasslands, grazed riparian, and moderately grazed yucca-grassland communities on sandy soils.	None – suitable habitat not present.
Mouse, Plains Pocket *Perognathus flavescens*	Mid grass plant communities on sandy to sandy loam soils with moderate to good plant cover (can tolerant significant amounts of bare soil).	None – suitable habitat not present.
Mouse, Silky Pocket *Perognathus flavus*	Continuous short- to mid-grass prairie or herbaceous cover on loamy soils with low amounts of bare ground. Most have yucca, cactus or shrubs for burrows.	None – suitable habitat not present.
Mouse, Preble's Meadow Jumping *Zapus hudsonious preblei*	Riparian areas with lush vegetation and a developed understory of native plants. Need uplands with native plant species for foraging.	None – suitable habitat not present.
Myotis, Fringed *Myotis thysanodes pahasapensis*	Coniferous woodlands and shrublands below 7,500 feet. Rocky outcroppings in mid-elevation ponderosa pine, pinyon/juniper, oak, & mixed conifer woodlands, grasslands, deserts, & shrublands.	None – suitable habitat not present.
Myotis, Little Brown *Myotis lucifugas*	Common in wooded areas of the western two-thirds of Colorado at elevations between 5,000 – 12,000 feet	None – suitable habitat not present.
Myotis, Long-legged *Myotis evotis*	Ponderosa pine forests, pinon-juniper woodlands, and riparian	None – suitable habitat not present.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
	areas in sagebrush country.	
Myotis, Western Small-footed *Myotis ciliolabrum*	Widely distributed throughout Colorado in broken terrain of canyons and foothills with cover of trees or shrubs.	None – suitable habitat not present.
Otter, River *Lontra canadensis*	Relatively large rivers at low to moderate elevations; need ice-free stretches of river in winter.	None – suitable habitat not present.
Pika *Ochotona princeps*	Restricted to talus rock in alpine tundra or subalpine forests in areas adjacent to alpine meadows.	None – suitable habitat not present; below elevational range.
Porcupine, North American *Erethizon dorsatum*	Found throughout Colorado, but most common in mountainous areas with coniferous trees.	None – suitable habitat not present.
Prairie Dog, Black-tailed *Cynomys ludovicianus*	Open prairie grasslands, disturbed areas, fallow and mowed agriculture fields.	No evidence of activity noted during site visit.
Rat, Ord's Kangaroo *Dipodomys ordii*	Occur in a variety of habitats, but need sandy soils for burrowing.	None – suitable habitat not present.
Ringtail *Bassariscus astutus*	Roughlands at moderate elevations with rocky canyons and foothills of pinyon-juniper woodlands, montane shrublands, or mixed conifer-oakbrush.	None – suitable habitat not present.
Sheep, Rocky Mtn. Bighorn *Ovis canadensis canadensis*	Bighorns typically occur in steep, high mountain terrain. In Colorado, they prefer habitat dominated by grass, low shrubs, rock cover and areas near open escape.	None – suitable habitat not present.
Shrew, American Water *Sorex palustris*	Found in mountainous areas in the western two-thirds of the state at elevations between 6,000 and 10,000 feet. Restricted to riparian habitats.	None – suitable habitat not present; below elevational range.
Shrew, Dwarf *Sorex nanus*	Known from the Southern Rocky Mountains at elevations above 5,500 feet.	None – suitable habitat not present; below elevational range.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Shrew, Least *Cryptotis parva*	Occur in a variety of habitats including shortgrass prairie, old field communities, marshy areas, and riparian woodland. These areas can sometimes be quite dry.	None – suitable habitat not present.
Shrew, Merriam's *Sorex merriami*	Occupies drier habitats than other shrews, particularly sagebrush or other semidesert shrublands. Also known to occur in montane shrublands, pinon-juniper woodlands, mixed montane and subalpine forests, and grasslands.	None – suitable habitat not present.
Squirrel, Spotted Ground *Xerospermophilus spilosoma*	Occur locally in suitable habitat. Prefer deep sandy soils with sparse vegetation, including overgrazed sandhills and lightly grazed mixed-grass prairie with bunchgrass and sand sage.	None – suitable habitat not present.
Squirrel, Thirteen-lined Ground *Ictidomys tridecemlineatus*	Short and mid-grasslands and modified environments were small shrubs and an abundance of crickets and beetles occur.	None – suitable habitat not present.
Vole, Western Heather *Phenacomys intermedius*	Spruce-fir, lodgepole, aspen, ponderosa pine, and grassy meadows in montane forests, subalpine forests, and alpine tundra.	None – suitable habitat not present; below elevational range.
Vole, Meadow *Microtus pennsylvanicus*	Associated with water; most common in marshy wetlands along riparian corridors.	None – suitable habitat not present
Reptiles & Amphibians		
Frog, Chorus *Pseudacris triseriata*	Common to a wide range of waterbodies including cattle, urban, rural, and mountain ponds, flooded meadows, and backwaters along streams. Shallow, grassy or reedy ponds that lack fish predators and have	None – suitable habitat not present at project site.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
	no current are used for breeding.	
Frog, Northern Leopard Rana pipiens	Wet meadows and the banks of and shallows of marshes, ponds, lakes, streams, irrigation ditches.	Possible. None have been seen or heard during the two site visits. Often locally extirpated; cannot compete with the wide-spread and invasive Bull Frog (*Lithobates catesbeianus*).
Lizard, Short-horned *Phrynosoma hernandesi*	Short and mixed-grass prairies, pinõn-juniper, sagebrush, open conifer woodland, and mountain shrubland in sandy or otherwise well-drained soils and usually in areas with sparse vegetation.	None – suitable habitat not present.
Salamander, Tiger *Ambystoma tigrinum*	All habitats within the species elevational range as long as there is a suitable body of water nearby for breeding. Most common in semi and permanent ponds.	None – suitable habitat not present at project site but could occur in manmade pond.
Snake, Common Garter *Thamnophis sirtalis*	Restricted to aquatic, wetland and riparian habitats at elevations below 6,000 feet: seldom found at isolated ponds.	Could occur near the Leggett Ditch.
Snake, Lined *Tropidoclonion lineatum*	Locally abundant in both natural and urban habitats which include damp site in flat plains grasslands, canyon bottom grasslands, riparian areas, and grassy vacant lots and gullies in cities.	Possible -- suitable habitat present along Leggett Ditch and over the project site.
Snake, Milk *Lampropeltis triangulum*	Occurs throughout most of eastern, southern, and western Colorado at elevations primarily below 2,400m (8,000 ft) in shortgrass prairie, sandhills, shrubby hillsides, canyons, and open stands of ponderosa pine in foothills, pinyon-juniper woodlands, and arid river valleys.	None – suitable habitat not present; below elevational range.

TABLE 6
Boulder County Vertebrate Wildlife Species of Concern
Boulder County Compost Processing Facility

Species	Habitat Requirements	Potential for Occurrence
Toad, Boreal *Bufo boreas boreas*	High altitude wetlands, ponds, etc.	None – suitable habitat not present; below elevational range.
Toad, Plains Spadefoot *Spea bombifrons*	Common in areas with soft sandy/gravelly soils along stream floodplains.	None – suitable habitat not present; below elevational range.
Turtle, Spiny Softshell *Apalone spinifera*	Inhabit streams ranging from large rivers to intermittently flowing creeks with permanent pools; in Colorado major rivers are primary habitat.	None – suitable habitat not present

11.0 PHOTOS

Photo 1. Ornamental trees from the nursery operation have a weedy understory that is mowed between the rows. (9/14/20).

Photo 2. Office building and entry area. (9/14/20).

Photos 3 & 4. This abandoned greenhouse and shade structure are now overgrown with ornamental species and weeds. (9/14/20).

Photo 5. Trees rooted in through nursery containers have died and the ones that remain have compromised root systems, so the long term viability is questionable. (9/14/20).

Photo 6. Weeds and small piles of nursery debris are common throughout the site. (9/14/20).

Photo 7. Wild carrot is common in the understory of the old nursery rows. (9/14/20).

Photo 8. Old berms and soil stockpiles are vegetated by weeds. (9/14/20).

Photos 9 & 10. A narrow band of wetlands lines the steep banks of the Leggett Ditch and the man-made irrigation pond. (9/14/20).

Photo 11. Ornamental trees and shrubs are the dominant vegetation type on the project site, creating a diverse canopy with an understory of weeds and agricultural grasses. (9/14/20).

Photo 12. Ash trees are one of the most common species at the site, but many are infected by the emerald ash borer, and so they will be removed. (9/14/20).

Photo 13. Rows of ornamental trees have rooted in through their pots or wire baskets. (9/14/20).

Photo 14. Mowed area of Canada thistle between the old nursery rows. (9/14/20).

Photo 15. A great horned owl was observed in the tree canopy during site reconnaissance. (9/14/20).

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Appendix A. IPaC Trust Resources Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
Phone: (303) 236-4773 Fax: (303) 236-4005
http://www.fws.gov/coloradoES
http://www.fws.gov/platteriver

In Reply Refer To: September 08, 2020
Consultation Code: 06E24000-2020-SLI-1851
Event Code: 06E24000-2020-E-04956
Project Name: Boulder County Compost

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
(303) 236-4773

Project Summary

Consultation Code: 06E24000-2020-SLI-1851

Event Code: 06E24000-2020-E-04956

Project Name: Boulder County Compost

Project Type: ** OTHER **

Project Description: Construct a new public compost facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.07857868658489N105.09963135501411W

Counties: Boulder, CO

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 5 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Preble's Meadow Jumping Mouse *Zapus hudsonius preblei* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4090	Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum*	Endangered

Population: interior pop.
No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:
- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/8505

Mexican Spotted Owl *Strix occidentalis lucida*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8196

Piping Plover *Charadrius melodus*	Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:
- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/6039

Whooping Crane *Grus americana*	Endangered

Population: Wherever found, except where listed as an experimental population
There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:
- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/758

Fishes

NAME	STATUS
Greenback Cutthroat Trout *Oncorhynchus clarkii stomias*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2775

Pallid Sturgeon *Scaphirhynchus albus*	Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:
- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened
Western Prairie Fringed Orchid *Platanthera praeclara* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Jul 31
Burrowing Owl *Athene cunicularia* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lark Bunting *Calamospiza melanocorys* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 10 to Aug 15
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Mccown's Longspur *Calcarius mccownii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9292	Breeds May 1 to Aug 15
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see

below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell

me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A

FRESHWATER POND

- PUBFx

RIVERINE

- R4SBAx

Appendix B. Cultural Resources Report

HISTORY COLORADO
Office of Archaeology and Historic Preservation
1200 Broadway, Denver, Colorado 80203

Erin Hauer
Birch Ecology LLC
PO Box 170
429 Main St.
Lyons, CO 80540

September 22, 2020

Re: Boulder County Land Use Review
File Search No. 23083

At your request, the Office of Archaeology and Historic Preservation has conducted a search of the Colorado Inventory of Cultural Resources within the area shown in the provided shapefiles, located in the following areas:

PM	T	R	S
6th	1N	69W	3

1 sites and 1 surveys were located in the designated area(s).

If information on any district, site, building, structure, or object in the project area was found, detailed information follows the summary. If no properties were found, but surveys are known to have been conducted in the project area, survey information follows the summary. We do not have complete information on surveys conducted in Colorado, and our site files cannot be considered complete because most of the state has not been surveyed for cultural resources. There is the possibility that as yet unidentified cultural resources exist within the proposed impact area.

Our letter should not be interpreted as formal consultation under Section 106 of the National Historic Preservation Act (36 CFR 800) or the Colorado Register of Historic Places (CRS 24-80.1). In the event that there is federal or state agency involvement, please note that it is the responsibility of the agencies to meet the requirements of these regulations.

We look forward to consulting with you regarding the effect of the proposed project on significant cultural resources in accordance with the Advisory Council on Historic Preservation regulations titled "Protection of Historic Properties" or the Colorado Register of Historic Places, as applicable (http://www.historycolorado.org/oahp/consultation-guidance).

If you have any questions, please contact the Office of Archaeology and Historic Preservation at (303) 866-3392. Thank you for your interest in Colorado's cultural heritage.

Steve Turner, AIA
State Historic Preservation Officer

*Information regarding significant archaeological resources is excluded from the Freedom of Information Act. Therefore, legal locations of these resources must not be included in documents for public distribution.

09/17/20

23083_s_sy

Appendix C. Environmental Record Search Results

E RecSearch Report

GeoLens by GeoSearch

Target Property:

Boulder County Compost Processing Facility
5762 N 107th St
Longmont, Boulder County, Colorado 80504

Prepared For:

Birch Ecology LLC

Order #: 154275
Job #: 373811
Date: 09/18/2020

Table of Contents

Disclaimer

This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR ï¿½312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal,state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFR ï¿½312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.

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Target Property Summary

Target Property Information

Boulder County Compost Processing Facility
5762 N 107th St
Longmont, Colorado 80504

Coordinates
Area centroid (-105.09942, 40.0787380)
5,065 feet above sea level

USGS Quadrangle
Erie, CO

Geographic Coverage Information

County/Parish: Boulder (CO)
ZipCode(s):
Lafayette CO: 80026
Longmont CO: 80504

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSCO	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR08	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR08	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR08	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSCO	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR08	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR08	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR08	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (CO) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ENVIRONMENTAL REAL COVENANTS LIST	COVENANTS	0	0	TP/AP
HAZARDOUS WASTE SITES- GENERATOR	HWSG	0	0	0.1250
ABOVEGROUND STORAGE TANK FACILITIES	AST	0	0	0.2500
UNDERGROUND STORAGE TANK FACILITIES	UST	0	0	0.2500
COLORADO BROWNFIELD SITES	BF	0	0	0.5000
HISTORICAL SOLID WASTE LANDFILLS	HISTSWLF	0	0	0.5000
LEAKING STORAGE TANK FACILITIES	LST	0	0	0.5000
LEAKING UNDERGROUND STORAGE TANKS TRUST FUND SITES	LUSTTRUST	0	0	0.5000
SOLID WASTE FACILITIES	SWF	0	0	0.5000
VOLUNTARY CLEANUP AND REDEVELOPMENT PROGRAM SITES	VCRA	0	0	0.5000
HAZARDOUS WASTE SITES- CORRECTIVE ACTION	HWSCA	0	0	1.0000
SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AIR POLLUTION CONTROL DIVISION PERMITTED FACILITIES	APCDP	0	0	TP/AP
ASBESTOS ABATEMENT AND DEMOLITION PROJECTS	ASBESTOS	0	0	TP/AP
COLORADO DISCHARGE PERMIT SYSTEM FACILITIES	CDPS	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
DRY CLEANING FACILITIES	CLEANERS	0	0	0.2500
HAZARDOUS WASTE SITES- TREATMENT, STORAGE & DISPOSAL	HWSTSD	0	0	0.5000
METHANE GAS STUDY SITES	METHANESITES	0	0	0.5000
REGISTERED RECYCLING FACILITIES	RECYCLERS	0	0	0.5000
URANIUM MILL TAILINGS SITES	UMTS	0	0	0.5000

SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR08	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR08	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR08	0.0200	0	NS	NS	NS	NS	NS	0
ERNSCO	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSCO	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR08	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR08	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR08	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR08	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR08	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (CO) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
APCDP	0.0200	0	NS	NS	NS	NS	NS	0
ASBESTOS	0.0200	0	NS	NS	NS	NS	NS	0
CDPS	0.0200	0	NS	NS	NS	NS	NS	0
COVENANTS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
HWSG	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
AST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
CLEANERS	0.2500	0	0	0	NS	NS	NS	0
UST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
HISTSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
HWSTSD	0.5000	0	0	0	0	NS	NS	0
LST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
LUSTTRUST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
METHANESITES	0.5000	0	0	0	0	NS	NS	0
RECYCLERS	0.5000	0	0	0	0	NS	NS	0
SWF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
UMTS	0.5000	0	0	0	0	NS	NS	0
VCRA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
HWSCA	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR08	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR08	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

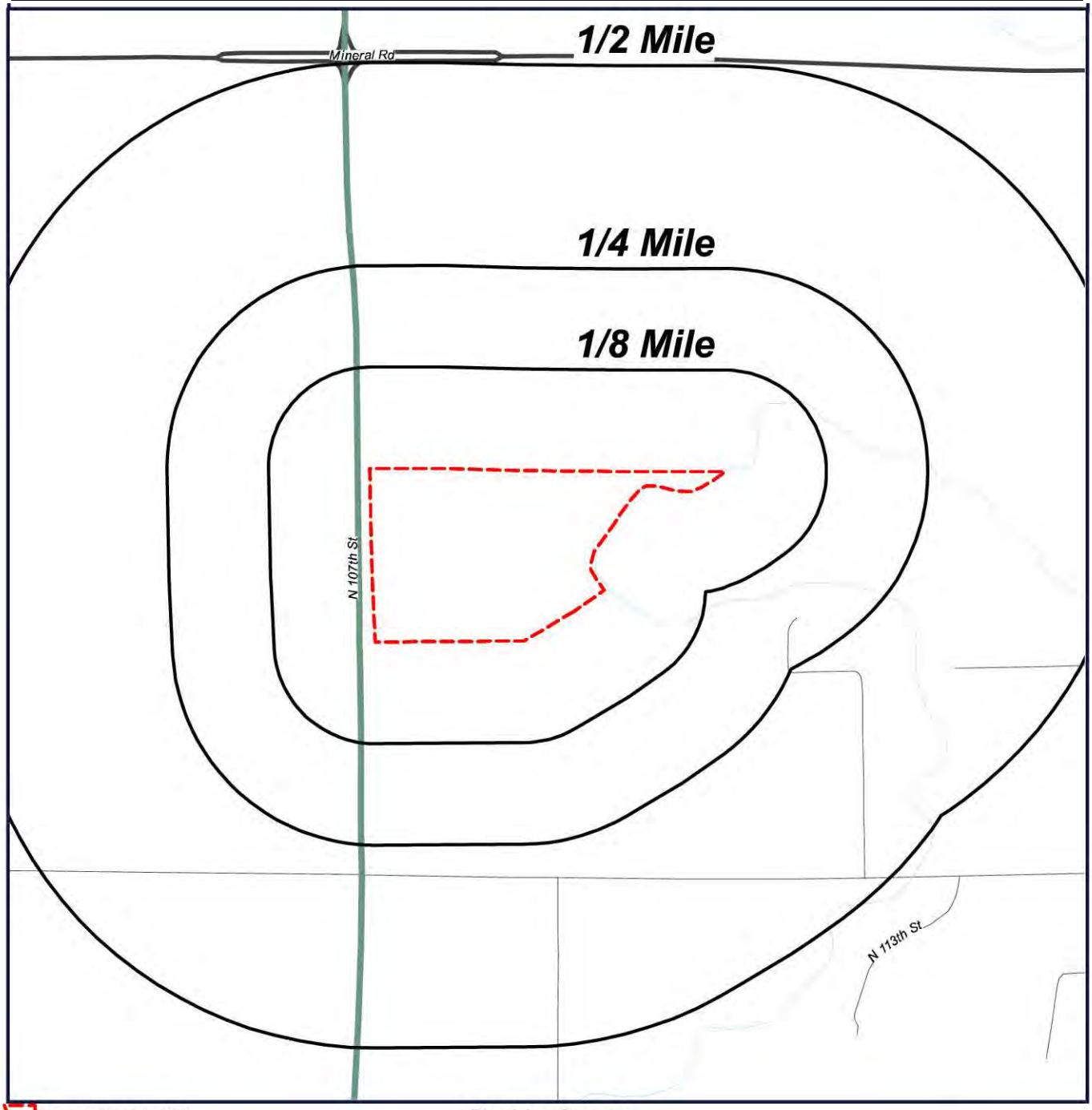
Radius Map 1

Boulder County Compost Processing Facility
5762 N 107th St
Longmont, Colorado
80504

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



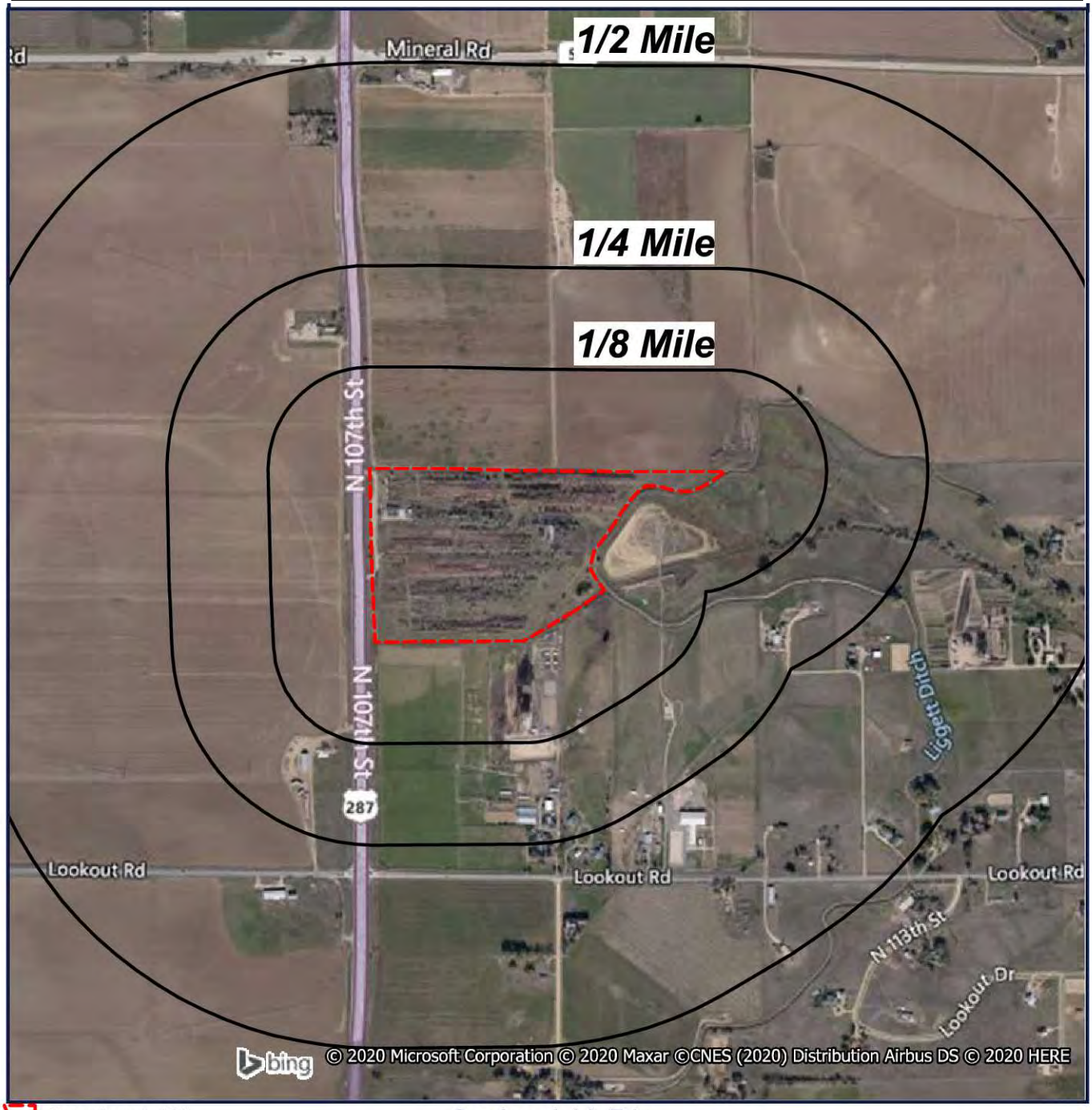
Target Property (TP)

Boulder County Compost Processing Facility
5762 N 107th St
Longmont, Colorado
80504

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map



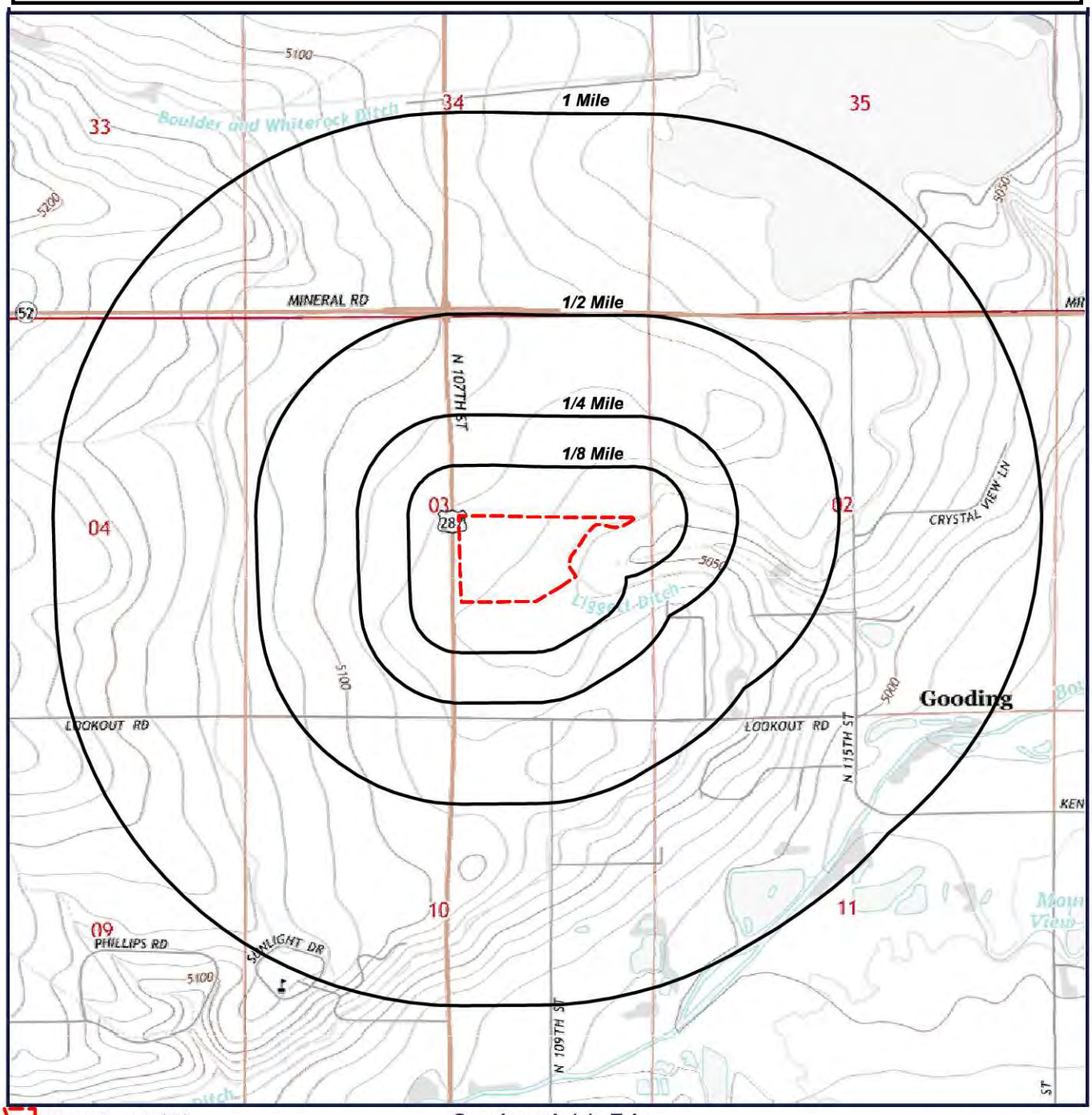
Target Property (TP)

Quadrangle(s): Erie
Boulder County
Compost
Processing Facility
5762 N 107th St
Longmont, Colorado
80504

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



Target Property (TP)

Quadrangle(s): Erie
Source: USGS, 07/23/2013
Boulder County Compost Processing Facility
5762 N 107th St
Longmont, Colorado 80504

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 5065 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

AIRSAFS Aerometric Information Retrieval System / Air Facility Subsystem

VERSION DATE: 10/20/14

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance. Enforcement and Compliance History Online (ECHO) Clean Air Act data from AFS are frozen and reflect data as of October 17, 2014, the EPA retired this system for Clean Air Act stationary sources.

ALTFUELS Alternative Fueling Stations

VERSION DATE: 04/30/20

Nationwide list of alternative fueling stations made available by the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Bio-diesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE).

BF Brownfields Management System

VERSION DATE: 07/08/20

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

BRS Biennial Reporting System

VERSION DATE: 12/31/15

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 06/17/20

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

DNPL Delisted National Priorities List

VERSION DATE: 06/22/20

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

DOCKETS EPA Docket Data

VERSION DATE: 12/22/05

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

DOD Department of Defense Sites

VERSION DATE: 12/01/14

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

EC Federal Engineering Institutional Control Sites

VERSION DATE: 08/26/20

This database includes site locations where Engineering and/or Institutional Controls have been identified as part of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. The data displays remedy component information for Superfund decision documents issued in fiscal years 1982-2017, and it includes final and deleted NPL sites as well as sites with a Superfund Alternative Approach (SAA) agreement in place. The only sites included that are not on the NPL, proposed for NPL, or removed from proposed NPL, are those with an SAA Agreement in place. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the

potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

ECHOR08 Enforcement and Compliance History Information

VERSION DATE: 05/30/20

The U.S. Environmental Protection Agency's Enforcement and Compliance History Online (ECHO) database, provides compliance and enforcement information for facilities nationwide. This database includes facilities regulated as Clean Air Act stationary sources, Clean Water Act direct dischargers, Resource Conservation and Recovery Act hazardous waste handlers, Safe Drinking Water Act public water systems along with other data, such as Toxics Release Inventory releases.

ERNSCO Emergency Response Notification System

VERSION DATE: 04/05/20

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

FEMAUST FEMA Owned Storage Tanks

VERSION DATE: 12/01/16

This is a listing of FEMA owned underground and aboveground storage tank sites. For security reasons, address information is not released to the public according to the U.S. Department of Homeland Security.

FRSCO Facility Registry System

VERSION DATE: 04/05/20

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

FUDS Formerly Used Defense Sites

VERSION DATE: 12/31/18

The Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not

all properties currently have polygon data available. DISCLAIMER: This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

FUSRAP Formerly Utilized Sites Remedial Action Program

VERSION DATE: 03/04/17

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

HISTPST Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

HMIRSR08 Hazardous Materials Incident Reporting System

VERSION DATE: 05/20/20

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

HWCD Hazardous Waste Compliance Docket Facilities

VERSION DATE: 04/29/20

This list of the Federal Agency Hazardous Waste Compliance Docket Facilities is maintained by the United States Environmental Protection Agency (EPA). According to the EPA, Section 120(c) of CERCLA requires EPA to establish a listing, known as the Federal Facility Hazardous Waste Compliance Docket (Docket), of Federal facilities which are managing or have managed hazardous waste; or have had a release of hazardous waste. Thus, the Docket identifies all Federal facilities that must be evaluated to determine whether they pose a risk to human health and the environment and it makes this information available to the public. In order for the Docket to remain current and accurate it requires periodic updating.

ICIS Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 03/28/20

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

ICISCLEANERS Integrated Compliance Information System Drycleaners

VERSION DATE: 03/28/20

This is a listing of drycleaner facilities from the Integrated Compliance Information System (ICIS). The U.S. Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments. The following Primary SIC Codes are included in this data: 7211, 7212, 7213, 7215, 7216, 7217, 7218, and/or 7219; the following Primary NAICS Codes are included in this data: 812320, 812331, and/or 812332.

ICISNPDES Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 04/26/20

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. This database is provided by the U.S. Environmental Protection Agency.

LUCIS Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

MLTS Material Licensing Tracking System

VERSION DATE: 06/29/17

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements. Disclaimer: Due to agency regulations and policies, this database contains applicant/licensee location information which may or may not be related to the physical location per MLTS site.

MRDS Mineral Resource Data System

VERSION DATE: 03/15/16

MRDS (Mineral Resource Data System) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps. A few updates last occurred 2015 and early 2016 for select mine site area/s.

MSHA Mine Safety and Health Administration Master Index File

VERSION DATE: 08/07/20

The Mine dataset lists all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970. It includes such information as the current status of each mine (Active, Abandoned, NonProducing, etc.), the current owner and operating company, commodity codes and physical attributes of the mine. Mine ID is the unique key for this data. This information is provided by the United States Department of Labor - Mine Safety and Health Administration (MSHA).

NLRRCRAC No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 06/15/20

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

NLRRCRAT No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 06/15/20

This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

NMS Former Military Nike Missile Sites

VERSION DATE: 12/01/84

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline,

heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

NPDESR08 National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES database was collected from the U.S. Environmental Protection Agency (EPA) from December 2002 through April 2007. Refer to the ICIS and/or ICIS-NPDES database as source of current data. This database includes permitted facilities located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

NPL National Priorities List

VERSION DATE: 06/22/20

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

ODI Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An “open dump” is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

PADS PCB Activity Database System

VERSION DATE: 10/09/19

PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of Polychlorinated Biphenyls (PCB) who are required to notify the U.S. Environmental Protection Agency of such activities.

PCSR08 Permit Compliance System

VERSION DATE: 08/01/12

The historic Permit Compliance System tracked enforcement status and permit compliance of facilities controlled

by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act. This database includes permitted facilities located in EPA Region 8 states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. This system has since been modernized by United States Environmental Protection Agency and is now integrated into the Integrated Compliance Information System (ICIS). Please refer to the ICIS database as the current source for this data.

PNPL Proposed National Priorities List

VERSION DATE: 06/22/20

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

RCRAC Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 06/15/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with corrective action activity.

RCRAGR08 Resource Conservation & Recovery Act - Generator

VERSION DATE: 06/15/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities currently generating hazardous waste. EPA Region 8 includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

RCRANGR08 Resource Conservation & Recovery Act - Non-Generator

VERSION DATE: 06/15/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities classified as non-generators. Non-Generators do not presently generate hazardous waste. EPA

Region 8 includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

RCRASC RCRA Sites with Controls

VERSION DATE: 08/04/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with institutional controls in place.

RCRASUBC Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 06/15/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities subject to corrective actions.

RCRAT Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities

VERSION DATE: 06/15/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities recognized as hazardous waste treatment, storage, and disposal sites (TSD).

RODS Record of Decision System

VERSION DATE: 06/22/20

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

SEMS Superfund Enterprise Management System

VERSION DATE: 06/22/20

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs.

SEMSARCH Superfund Enterprise Management System Archived Site Inventory

VERSION DATE: 07/27/20

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System Archived Site Inventory (List 8R Archived) replaced the CERCLIS NFRAP reporting system in 2015. This listing reflects sites at which the EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program.

SEMSLIENS SEMS Lien on Property

VERSION DATE: 06/22/20

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs. This is a listing of SEMS sites with a lien on the property.

SFLIENS CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete. Please refer to the SEMSLIENS database as source of current data.

SMCRA Surface Mining Control and Reclamation Act Sites

VERSION DATE: 06/24/20

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those

problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

SSEHRIPFAS SSEHRI PFAS Contamination Sites

VERSION DATE: 12/12/19

This PFAS Contamination Site Tracker database is compiled by the Social Science Environmental Health Research Institute (SSEHRI) at Northeastern University. According to the SSEHRI, the database records qualitative and quantitative data from each known site of PFAS contamination, including timeline of discovery, sources, levels, health impacts, community response, and government response. The goal of this database is to compile information and support public understanding of the rapidly unfolding issue of PFAS contamination. All data presented was extracted from government websites, news articles, or publicly available documents, and this is cited in the tracker. Disclaimer: The source conveys this database undergoes regular updates as new information becomes available, some sites may be missing and/or contain information that is incorrect or outdated, as well as their information represents all contamination sites SSEHRI is aware of, not all possible contamination sites. This data is not intended to be used for legal purposes. Limited location details are available with this data. Please access the following source link for the most current information: https://pfasproject.com/pfas-contamination-site-tracker/

SSTS Section Seven Tracking System

VERSION DATE: 08/04/20

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. "Production" includes formulation, packaging, repackaging, and relabeling. For this database, the Product Information is only available for establishments up through 2014 or prior years, product details are no longer released by the EPA within the current SSTS non-Confidential Business Information data.

TRI Toxics Release Inventory

VERSION DATE: 12/31/18

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

TSCA Toxic Substance Control Act Inventory

VERSION DATE: 12/31/16

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured,

imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency (EPA) authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site. The EPA has collected Chemical Data Reporting (CDR) data since in 1986 (as Inventory Update Reporting). Collections occur approximately every four years and reporting requirements changed from collection to collection.

USUMTRCA Uranium Mill Tailings Radiation Control Act Sites

VERSION DATE: 03/04/17

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

APCDP Air Pollution Control Division Permitted Facilities

VERSION DATE: 06/29/20

This list of Air Pollution Control Division Permitted Facilities is maintained by the Colorado Department of Public Health and Environment. The Stationary Sources Program evaluates and develops air permits for stationary sources in Colorado. The program inspects sources to determine compliance with air regulations and permit conditions and maintains a computerized inventory of air pollution emissions throughout the state.

ASBESTOS Asbestos Abatement and Demolition Projects

VERSION DATE: 12/28/17

The Colorado Department of Public Health and Environment's Air Pollution Control Division assists schools and businesses to comply with air pollution laws regulating asbestos and asbestos containing materials. The regulation that governs asbestos in Colorado is the Colorado Air Quality Control Commission s Regulation No. 8, Part B, "Emission Standards for Asbestos." Notification is required for all demolitions of all facilities and all asbestos abatement projects that exceed the trigger levels, whatever is the lesser quantity. The notification requirements apply to both friable and non-friable asbestos materials. This database contains those related projects since January 2008.

AST Aboveground Storage Tank Facilities

VERSION DATE: 08/04/20

This list of aboveground storage tank (AST) facilities is maintained by the Colorado Department of Public Health and Environment. Types of tanks included are: currently in use, never installed/existed, never installed-permit revoked, not regulated, other, pending installation, permanently closed, temporarily out of use.

BF Colorado Brownfield Sites

VERSION DATE: 04/24/20

This list of Colorado brownfields is maintained by the Colorado Department of Public Health & Environment (CDPHE) Hazardous Materials and Waste Management Division Brownfields Program in conjunction with the Voluntary Cleanup Program (VCUP). The brownfields database is an inventory of sites for which CPDHE has provided brownfields assistance in the form of targeted brownfields assessments, a revolving loan or grant through the Colorado Brownfields Revolving Loan Fund, and/or assistance through our state brownfields grants program. Most of these incentives are available only to local governments or nonprofits. In some cases, sites that receive state incentives also go through the VCUP program but most of the VCUP applicants are private entities not eligible for other state brownfields incentives.

CDPS Colorado Discharge Permit System Facilities

VERSION DATE: 02/03/19

The Colorado Department of Public Health & Environment's Water Quality Control Division regulates the

Colorado Discharge Permit System. This system controls stormwater discharges from construction activities by requiring a Stormwater Construction Permit to reduce pollutants from entering streams, river, lakes and wetlands as a result of runoff from residential, commercial and industrial areas. This database also includes facilities with Industrial Stormwater Permits.

CLEANERS Dry Cleaning Facilities

VERSION DATE: 07/27/20

This list of dry cleaners, which have obtained an air permit through the Air Pollution Control Division, is maintained by the Colorado Department of Public Health and Environment.

COVENANTS Environmental Real Covenants List

VERSION DATE: 08/24/20

This list of environmental covenants is maintained by the Colorado Division of Public Health and Environment. Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. These covenants, which are recorded with the deed and run with the land, provide a mechanism to ensure that institutional controls that are part of environmental remediation projects are properly implemented and that engineered structures are protected and maintained, so that implemented remedies continue to be protective of human health and the environment for as long as any residual contamination remains a risk.

HISTSWLF Historical Solid Waste Landfills

VERSION DATE: NR

This historical solid waste landfills database contains data from the Hazardous Materials Waste Management Division (HMWMD) of the Colorado Department of Public Health and other various state and local agencies. In the early 1980s, the HMWMD conducted a survey of staff members and local agencies to compile this listing of sites that were known or thought to have waste issues. This Solid Waste Historical Data is not considered complete or verifiable and has not been maintained since the late 1980s. The HMWMD is not responsible and shall not be liable to the used for damages of any kind arising out of the use of this data or information.

HWSCA Hazardous Waste Sites- Corrective Action

VERSION DATE: 06/30/03

The Resource Conservation and Recovery Act (RCRA) was enacted by Congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the Hazardous and Solid Waste Amendments (HSWA) were added to RCRA providing for corrective action at facilities subject to RCRA. That same year, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. Corrective action may be implemented as part of a RCRA Hazardous Waste Permit, an Order, or a Corrective Action Plan pursuant to the Colorado Hazardous Waste Regulations. Corrective action is the process by which regulated facilities investigate and remediate, as necessary, all contamination (soil, ground water, surface water, air) associated with their releases into the environment. Historic Corrective Action Sites are facilities that have

completed the RCRA Subtitle C corrective Action process. This data was provided by the Colorado Department of Public Health and Environment in 2008, please contact the agency directly to verify current site details.

HWSG Hazardous Waste Sites- Generator

VERSION DATE: 06/30/03

The Resource Conservation and Recovery Act (RCRA) was enacted by congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. This facility listing includes RCRA sites listed as generators of hazardous waste (Small Quantity Generators and Large Quantity Generators) and was provided by the Colorado Department of Public Health and Environment in 2008, please contact the agency directly to verify current site details.

Small Quantity Generators (SQG) generate, in any calendar month, more than 100 kg (220 lbs.) but less than 1,000 kg (2,200 lbs.) of RCRA hazardous waste; and generate, in any calendar month, or accumulate at any time, no more than 1 kg (2.2 lbs.) of acute hazardous waste and no more than 100 kg (220 lbs.) of material from the cleanup of a spill of acute hazardous waste; and accumulate on-site no more than 6000 kg (13,200 lbs) of hazardous waste at any one time; or, the site is a Small Quantity Generator if the site met all other criteria for a Conditionally Exempt Small Quantity Generator, but accumulated, at any time, more than 1,000 kg (2,200 lbs.) of RCRA hazardous waste.

Large Quantity Generators (LQG) generate, in any calendar month, 1,000 kg (2,200 lbs.) or more of RCRA hazardous waste; or generate, in any calendar month, or accumulated at any time, more than 1 kg (2.2 lbs.) of RCRA acute hazardous waste; or generate, in any calendar month, or accumulated at any time, more than 100 kg (220 lbs.) of spill cleanup material contaminated with RCRA acute hazardous waste.

HWSTSD Hazardous Waste Sites- Treatment, Storage & Disposal

VERSION DATE: 06/30/03

The Resource Conservation and Recovery Act (RCRA) was enacted by congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. TSD facilities treat, store, dispose, or recycle hazardous waste on site in units and therefore are subject to RCRA permitting requirements. Historic TSDs are facilities that have completed closure and/or post-closure of the RCRA Subtitle C Regulated Unit(s) or the Treatment/Storage/Disposal Unit is no longer regulated. This database was provided by the Colorado Department of Public Health and Environment in 2008, please contact the agency directly to verify current site details.

LST Leaking Storage Tank Facilities

VERSION DATE: 06/30/20

This database of aboveground and underground storage tank facilities with confirmed releases is a compilation of several lists maintained by the Colorado Department of Labor and Employment. Currently In Use, Never Installed/Existed, Never Installed-Permit Revoked, Not Regulated, Other, Pending Installation, Permanently Closed, Temporarily Out of Use tanks are included in this data. The next set of data is obtained from the Active

and Closed OPS Petroleum Release Events in Colorado database. This data includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination). The Events data utilized in this database includes the following status types: Brownfield, Closed, Enforcement, LUST Trust, Open and State Lead. Please note some Events (confirmed releases) may not have a contaminant present.

LUSTTRUST Leaking Underground Storage Tanks Trust Fund Sites

VERSION DATE: 01/01/00

Suspected tank leaks have been discovered at the sites are included in this database, but the facility responsible for the leak has not been identified. The state's investigation and search for responsible parties is paid for out of the state's Leaking Underground Storage Tank (LUST) Trust Fund. This data was originally collected in 2002 from the Colorado Department of Labor & Employment, Division of Oil & Public Safety, State Fund Section by a former environmental database company known as Satisfi. Please refer to State LST database as source of current LUST Trust sites.

METHANESITES Methane Gas Study Sites

VERSION DATE: 01/01/81

This Investigation of Methane Gas Hazards report was prepared by the Denver Office of Emergency Preparedness in 1981. The purpose of this study was to assess the actual and potential generation, migration, explosive and related problems associated with specified landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. The Colorado Department of Health selected eight landfills as priorities due to population density and potential hazards to population and property.

RECYCLERS Registered Recycling Facilities

VERSION DATE: 09/01/19

This list of registered recycling facilities in Colorado is maintained by the Colorado Department of Public Health & Environment. This list includes primarily processing facilities for recyclable materials, such as: material recovery facilities, industrial recycling operations, and recyclable material end user sites. Collection centers/drop-off locations are not included unless the site is also processing recyclable materials (separating, sorting, dismantling, grinding, baling, etc.).

SF Superfund Sites

VERSION DATE: 03/17/20

This list of superfunds is maintained by the Colorado Department of Public Health and Environment. This list contains active, deleted and proposed "Superfund" hazardous waste sites, as well as those sites identified through the Natural Resource Damages section of Superfund legislation and one Private Non-Superfund Cleanup site. A site qualifies for the National Priorities List (NPL or Superfund list) when the U.S. Environmental Protection Agency (EPA) determines there is a release or threatened release of hazardous substances that may

endanger public health, welfare or the environment. In Colorado, the lead agency for Superfund remediation may be either the EPA or the Colorado Department of Public Health and Environment.

SPILLS Spills Listing

VERSION DATE: 06/15/20

The Colorado Department of Public Health and Environment's Division of Emergency Preparedness and Response maintains this listing of chemical spills and/or releases.

SWF Solid Waste Facilities

VERSION DATE: 06/16/20

The Colorado Department of Public Health and Environment maintains this database of solid waste disposal facilities, transfer stations, recyclers, waste tire registrants, and waste grease registrants.

UMTS Uranium Mill Tailings Sites

VERSION DATE: 08/09/02

There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act (UMTRA). These nine sites, know commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going. This database was provided by the Colorado Department of Public Health and Environment in 2008, please contact the agency directly to verify current site details.

UST Underground Storage Tank Facilities

VERSION DATE: 08/04/20

This list of underground storage tank (UST) facilities is maintained by the Colorado Department of Public Health and Environment. Types of tanks included are: currently in use, never installed/existed, never installed-permit revoked, not regulated, other, pending installation, permanently closed, temporarily out of use.

VCRA Voluntary Cleanup and Redevelopment Program Sites

VERSION DATE: 06/30/20

This list of Voluntary Cleanup and Redevelopment Program Sites is maintained by the Colorado Department of Public Health and Environment (CDPHE) and includes both voluntary cleanup and brownfield properties. The Voluntary Cleanup and Redevelopment program was created in 1994. The objective of the program is to

facilitate the redevelopment and transfer of contaminated properties. Properties that sit untouched because of their real or perceived contamination can be rehabilitated using the CDPHE's Brownfields Program in conjunction with the Voluntary Cleanup Program. Cleanup decisions are based on existing standards and the proposed use of the property. The actual cleanup and verification is the owner's responsibility.

Environmental Records Definitions - TRIBAL

INDIANRES Indian Reservations

VERSION DATE: 09/27/17

This database is extracted from select geographic and cartographic information from the U.S. Census Bureau. The Bureau of Indian Affairs (BIA) within the U.S. Department of the Interior (DOI) provides the list of federally recognized tribes. The American Indian/Alaska Native/Native Hawaiian (AIANNH) Areas includes the following legal entities: federally recognized American Indian reservations and off-reservation trust land areas, state-recognized American Indian reservations, and Hawaiian home lands (HHLs). The boundaries for federally recognized American Indian reservations and off-reservation trust lands are as of January 2017. The boundaries for state-recognized American Indian reservations and for state designated tribal statistical areas were delineated by state governor-appointed liaisons for the 2010 Census through the State American Indian Reservation Program and Tribal Statistical Areas Program respectively.

LUSTR08 Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/14/20

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

ODINDIAN Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

USTR08 Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/14/20

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

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October 9, 2020

Mr. Justin Price, Associate AIA, LEED AP
PEH ARCHITECTS
1720 14th Street, Suite 100
Boulder, Colorado 80302

RE: Boulder County Compost Process Facility – Onsite Wastewater Treatment System Evaluation & Preliminary Design
JVA Job No. 1102e

Dear Justin:

PEH Architecture is designing the new Boulder County Compost Facility located on a former tree farm. Sanitary sewage will be generated from the existing office building, a new scale house, and a maintenance building. Connection to municipal sewer is not feasible and use of onsite wastewater treatment systems (OWTS) will be pursued. JVA performed a records review and site visit to observe the existing OWTS, which is in overall good condition, but almost thirty years old. Two preliminary OWTS design options are outlined below. Option A uses the existing OWTS and incorporates two new OWTS. Option B uses the existing OWTS and long effluent forcemains to connect the scale house and maintenance building. Both options utilize sand/oil interceptors for the scale pit drain and maintenance building drain, which will be pumped and hauled. The outdoor wash pad is a nonpoint discharge, and not County regulated.

Onsite Wastewater Treatment System Records Review

Based on permits and drawings obtained from Boulder County Public Health, two OWTS permit applications were submitted for the 21 acre property. OWTS 1 was constructed in 1991 to serve the existing building, and consists of a small collection system, one septic tank, a soil treatment area (STA) diverter valve, and a trenched STA, see Table 1 below. The other proposed OWTS on the eastern side of the property submitted for a permit in 1994, but was never constructed.

On April 4th 2018, a property transfer inspection for OWTS 1 was conducted by Boulder County Public Health, which passed inspection. On April 11th 2018, an OWTS repair agreement was issued by Boulder County Public Health requesting an engineer's report showing that the existing OWTS is adequately sized for the proposed use prior to building occupancy. Boulder County Environmental Health OWTS Permits, design drawings, and property transfer reports are included in Attachment A. The following table describes the existing OWTS infrastructure.

Table 1 – Boulder County Compost OWTS 1 Existing Infrastructure

Parameter	Description
Design Flow	585 gallons per day (gpd)
Collection System	10 feet of pipe from building stubout on northeast corner of building to Septic Tank
Septic Tank	1,000 gallon, two-compartment, with influent and effluent tees
Diverter valve	Two zone, located in 4 inch PVC. No cap.
Soil Treatment Area	480 square feet. Two trenches. Observation ports on corners of STA.

ONSITE WASTEWATER TREATMENT SYSTEM OBSERVATIONS

Image 1 – OWTS 1 Location

Image 2 – OWTS 1 Septic Tank

A site visit was conducted on July 29, 2020 to evaluate the existing OWTS infrastructure. OWTS 1 is furthest west on the property and serves the existing building (proposed office). For OWTS 1, flows generated from the proposed office convey through 10-feet of pipe to a 1,000 gallon two compartment septic tank (see Image 1 and 2). The concrete septic tank has two concrete risers and lids, and inlet and outlet tees. The concrete appeared to be in good condition and no cracks were observed in the tank, but there was water in the tank likely from the Boulder County property transfer inspection. Immediately outside the septic tank outlet, a diverter valve is housed in an open four inch tube; the diverter valve could not be observed due to sediment in the tube. From the diverter valve, septic tank effluent can flow to one of two trenches, each 80-feet long by 2-feet wide, and equipped with a monitoring pipe on the eastern side. Although the exact location of the trenches could not be located, they are likely near the western green house, see Image 1. No surfacing of effluent was observed in either trench, and the monitoring pipes could not be located.

ONSITE WASTEWATER TREATMENT SYSTEM PRELIMINARY DESIGN OPTIONS

PRELIMINARY DESIGN OPTION A

Preliminary Design Option A will consist of three separate OWTS across the site. OWTS 1 will be the existing OWTS, and will serve the six full time employees, and 21 transient visitors. The scale house will have a new OWTS (OWTS 2) to serve the full time employee, and a separate sand/oil interceptor for the drain in the scale pit that will be pumped and hauled. The maintenance building will have a new OWTS (OWTS 3) to serve the six truck workers (transient visitors), and a separate sand/oil interceptor for floor drains in the maintenance bay that will be pumped and hauled. Per the EPA, maintenance bay floor drain waste cannot be combined with a County permitted OWTS. See Attachment B for Preliminary Design Option A site plan.

Since this option has multiple OWTS, Colorado Department of Public Health and Environment (CDPHE) Policy Six criteria apply. The maximum design capacity for any single structure shall be below 2,000 gpd and the total design capacity for the property shall be below 6,000 gpd. Option A meets these criteria and does not require CDPHE approval. All components of the OWTS have to be 500-feet beyond the 100 year floodplain, which they are, see Attachment C. CDPHE Policy Six setback distances from each individual STA, and to surrounding wells, streams, lakes, and water courses must be maintained, as well as setback listed in the Boulder County Environmental Health OWTS Regulations (Regulations). OWTS 1, 2, and 3 have horizontal influence areas of 90, 22, and 24 feet, respectively. Due to the size of the property, all STA's comply with the horizontal influence areas, and setbacks from the Regulation.

For existing OWTS 1, the new design capacity accounts for six full time employees working one shift and 21 transient visitors. Per capita flowrates established from the Regulations are 15 and 5 gpd/person for the full time employees and transient visitors, respectively, which yield a design capacity of 195 gallons per day (gpd). Septic tank sizing for commercial establishments is based on a 48 hour hydraulic retention time, yielding a minimum septic tank size of 390 gallons. STA sizing was based on the 195 gpd design flow and long term acceptance rate (LTAR) of 0.80 to yield a minimum square footage of 244. The long term acceptance rate was derived from the 1991 design percolation rate of 15 minutes per inch and corresponding LTAR in Table 10-1 from the Regulations. As seen in Table 2 below, the existing OWTS is sized appropriately for the proposed use.

Table 2 – Preliminary Design Option A OWTS 1 Design Comparison

Parameter	1991 OWTS Design Criteria	2020 OWTS Design Criteria	Conformance with Original 1991 Design and 2020 Boulder County OWTS Regulations
Design Capacity (gpd)	585 gpd	195 gpd	**Yes** Below 585 gpd from 1991 design. Below 2,000 gpd for Boulder County requirement.
Septic Tank Sizing	1,000 gal two compartment	390 gal total	**Yes** Existing Infrastructure remains from 1991 design. Boulder County 48 hour retention time and two compartment requirement fulfilled
Soil Treatment Area Sizing	480 square feet	244 square feet	**Yes** Below 480 square feet from 1991 Design based on Boulder County sizing criteria

For OWTS 2 the design capacity accounts for one full time employee in the scale house. 15 gpd/person per capita flow was used for the full time employee, which yielded a design capacity of 15 gpd. The septic tank is sized for a 48 hour hydraulic retention time, yielding a minimum septic tank size of 30 gallons for OWTS 2; the smallest two compartment septic tank available locally is 1,000 gallons. STA sizing was based on the design flows and LTAR of 0.20 to yield a minimum square footage of 52.5; the LTAR was derived from TL1 effluent, USGS WebSoil Survey results for a silty clay, and Table 10-1 from the Regulations (USGS WebSoil survey results are given in Attachment D). STA sizing incorporated adjustment factors for a gravity trench utilizing infiltration chambers. It's assumed that groundwater will be low enough to not require a pumped, mounded STA. These assumptions can be confirmed with soil testing. Design criteria for OWTS 2 is shown in Table 3 below.

For OWTS 3 the design capacity accounts for six truck workers in the maintenance building. 5 gpd/person per capita flow was used for the truck workers (transient visitors), which yielded a design capacity of 30 gpd. The septic tank is sized for a 48 hour hydraulic retention time, yielding a minimum septic tank size of 60 gallons. STA sizing was based on the design flows and LTAR of 0.20 to yield a minimum square footage of 105; the LTAR was derived from TL1 effluent, USGS WebSoil Survey results for a silty clay, and Table 10-1 from the Regulations (USGS WebSoil survey results are given in Attachment D). STA sizing incorporated adjustment factors for a gravity trench utilizing infiltration chambers. It's assumed that groundwater will be low enough to not require a pumped, mounded STA. These assumptions can be confirmed with soil testing. Design criteria for OWTS 3 is shown in Table 3 below.

Table 3 – Preliminary Design Option A OWTS 2 and 3 Design Criteria

OWTS	Design Capacity (gpd)	Septic Tank Minimum Volume (gal)	Soil Treatment Area Minimum Footprint (ft^2)
2	15	30	52.5
3	30	60	105

PRELIMINARY DESIGN OPTION B

Preliminary Design Option B collects all wastewater flows from the site and directs them to the existing OWTS 1. The scale pit and maintenance bay floor drain waste would still be directed to sand/oil interceptor's and be pumped and hauled. The scale house and maintenance building will each have a 1,000 gallon two compartment tank, equipped with an effluent pumping system. New effluent forcemains will be installed from the septic tanks across the site to the existing septic tank for OWTS 1. The design capacity, septic tank sizing, and STA sizing accounts for all wastewater flows from the site and were calculated similar to Preliminary Design Option A, see Table 4 below.

Table 4 – Preliminary Design Option B OWTS 1 Design Comparison

Parameter	1991 OWTS Design Criteria	2020 OWTS Design Criteria	Conformance with Original 1991 Design and 2020 Boulder County OWTS Regulations
Design Capacity (gpd)	585 gpd	285 gpd	**Yes** Below 585 gpd from 1991 design. Below 2,000 gpd for Boulder County requirement.
Septic Tank Sizing	1,000 gal two compartment	570 gal total	**Yes** Existing Infrastructure remains from 1991 design. Boulder County 48 hour retention time and two compartment requirement fulfilled
Soil Treatment Area Sizing	480 square feet	356.25 square feet	**Yes** Below 480 square feet from 1991 Design based on Boulder County sizing criteria

EPA CLASS V SHALLOW INJECTION WELLS

CDPHE Policy Six requires an EPA Class V Injection Well application be submitted if a non-residential establishment has the capacity to serve 20 or more people per day. The application is a basic inventory form of facility use and of chemicals on the site. As part of the EPA Class V Shallow Injection Well, the EPA does not allow maintenance bay floor drain wastewater to be combined with a County permitted OWTS, see Attachment E.

OPINION OF PROBABLE COST

The opinion of probable costs (OPC) include capital and installation costs for Preliminary Design Option A and B. The OPC does not incorporate costs for the Class V shallow injection well or if high groundwater were encountered and a pumped, mounded STA were to be required the costs would be substantially higher. Based on this analysis the OPC for Preliminary Design Option A is $83,000, and Preliminary Design Option B is $214,700. The detailed OPC's are included in Attachment F.

CONCLUSIONS & RECOMMENDATIONS

Based on the records review, site visit, and proposed capacity analysis, the existing OWTS 1 appears to be functioning properly and is sized appropriately for Preliminary Design Option A or B. Although existing OWTS 1 appears to be functioning properly and can theoretically receive all sanitary wastewater flows from the site, the system is almost thirty years old and hasn't been in operation for years to observe how the system operates under peak flows. Preliminary Design Option B has two fewer OWTS, but the infrastructure required to pump sanitary effluent from the scale house and maintenance building to existing OWTS 1 is extensive, and higher than the cost of Preliminary Design Option A. Due to the unknown performance of existing OWTS 1 under peak flow conditions, and costs, we recommend that Preliminary Design Option A be pursued. To continue with detailed design, soil testing for OWTS 2 and OWTS 3 would need to be conducted to verify soil type and identify the high groundwater level.

Sincerely,
JVA, INCORPORATED

By: _____
James Cochran, P.E.
Project Engineer

Attachment A – Existing OWTS Documents
Attachment B – Preliminary Site Plan
Attachment C – FEMA FIRM map
Attachment D – WebSoil Survey Results
Attachment E – EPA Class V Shallow Injection Well Documentation
Attachment F – Opinion of Probable Cost

ATTACHMENT A – EXISTING OWTS DOCUMENTS

HAROLD E. DONNELLY

Registered Professional
Engineer and Land
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499-6117

April 6, 1991

Division of Environmental Health
Boulder County Health Department
3450 Broadway
Boulder, Col orado 80302
Attn: Tom Douville, Environmental Health Program Manager

Re: Individual sewage disposal system for Rainbow Nursery, 5762 N. 107th Street, U.S. 287, an 80 acre tract located in the SE¼ of Section 3, T1N, R69W, Boulder County, Colorado.

Dear Tom,

The installation of the above described engineer designed individual sewage disposal system was inspected by me on two separate occasions and was found to be installed in compliance with the Boulder County Individual Sewage Disposal System Regulations and the intent of the plans and specifications, Dwg. 91-108, dated 3-9-91. Two trenches with 80 linear feet of 10 inch SB-2 gravel-less pipe in each trench (total 160 L.F.), a total equivilent area of 480 square foot, was installed. The bottom of the pipe was not installed deeper than two foot below original grave. The intercept ditch to the west at the highway will lower the maximum seasonal water table to six foot. The system was approved for backfilling with sandy loam topsoil. All surface water runoff shall be diverted around or away from the absorption trench area.

The certification of this design and approval of the installation of the system is voided if the owner exceeds the design flow, or does not complete or follow the requirements and recommendations set forth in the design plan or this letter. The owner is responsible for maintaining the system in accordance with the Individual Sewage Disposal System Regulations and have the septic tank pumped every three years, or as required. Pumping receipts shall be made available to the Boulder County Health Department upon request.

Yours truly,

Harold E. Donnelly

Harold E. Donnelly 4-6-91

Copy: Rainbow Nursery with Care and Maintenance letter
c/o Barney Barnett, agent

HAROLD E. DONNELLY

Registered Professional
Engineer and Land
Surveyor

617 Ord Drive
Boulder, Colorado 80303
499-6117

March 9, 1991

Division of Environmental Health
Boulder County Health Department
3450 Broadway
Boulder, Colorado 80302
Attn: Tom Douville, Environmental Health Program Manager

Re: Application for an individual sewage disposal system for Rainbow Nursery, Barney Barnett, 5762 N. 107th Street, U.S. 287, an 80 acre tract located in the SE 1/4 of Section 3, T1N, R69W, Boulder County, Colorado.

Dear Tom,

Enclosed is an engineer design of an individual sewage disposal system for Rainbow Nursery, Barney Barnett, for their tract which is in an area of high seasonal water table. I have made a site inspection and evaluated the entire area including well and septic system locations. The absorption area to the east of the existing nursery building was selected. The perc rate in this area averaged 15 MPI. The system has been designed for a maximum of 26 day workers at 15 GPD per person, total 390 GPD.

An eight foot soil profile hole was dug. No bedrock was encountered. Ground water was at seven foot below original grade at the time of this inspection. The maximum seasonal water table is indicated at six foot below original grade.

A cross slope fo 2 to 4% in the area of the proposed absorption area would not create a soil stability problem. The lot is served by Left Hand Water Supply. There are no existing wells within 200 feet of the proposed absorption area. Considering the density and that there are no adverse site geological conditions, a standard individual sewage disposal system may be installed and would not result in the pollution of the ground water.

The design of this system is to utilize a 1000 gallon, two-compartment septic tank with discharge into two trenches with 80 L.F. of SB-2 gravel-less pipe in each trench (total equivilent area of 480 sq. ft.). A diverter valve will be installed. The trenches will be alternated every 3 to 6 months by switching the diverter valve. This allows the trench not in use to dry out and regain its absorptive capacity. The bottom of the SB-2 gravel-less pipe should not be installed deeper than two foot below original grade. I have discussed the proposed system with Mr. Barnett.

The design of this system is in full compliance with the US Public Health Service Publication No. 526, "Manual of Septic Tank Practice" and the Boulder County Individual Sewage Disposal System Regulations.

Yours truly,

Harold E. Donnelly 3-11-91

Copy: Barney Barnett

L/4

987

New X
Repair
Upgrade
Addition
Renewal
Change of Owner

Receipt Number 87733

BOULDER COUNTY HEALTH DEPARTMENT

3450 Broadway, Boulder, CO 80304
441-1190

APPLICATION AND PERMIT TO INSTALL, CONSTRUCT, ALTER OR REPAIR INDIVIDUAL SEWAGE DISPOSAL SYSTEM (SEPTIC TANK)
CERTIFICATION TO BOULDER COUNTY LAND USE DEPARTMENT (COUNTY BUILDING INSP. DEPT.)

Owner BARNEY C. BARNETT Mailing Address 8209 WEBSTER ST. ARVADA Colo. 80003
City ARVADA State Colo. Zip 80003 Home Phone 424-5171 Work Phone 422-3878
Agent ..... Street ..... City ..... Zip ..... Phone .....
Site Address 5762 N. 107TH Installer .....
Legal Description (short) S13, T1N, 69W

TO BE FILLED OUT BY APPLICANT

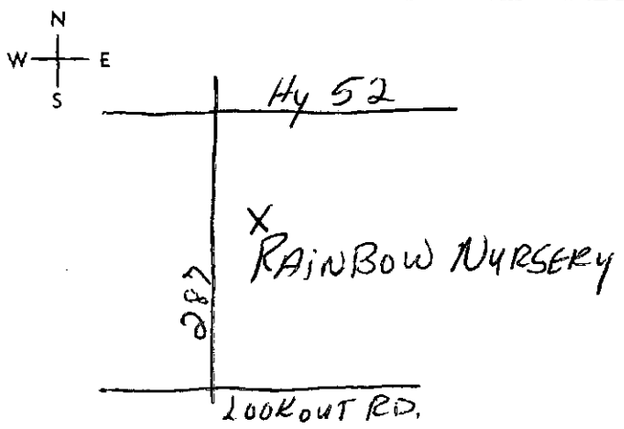
1. Existing Buildings NO
2. Areas to be surfaced DRIVEWAYS
3. Building proposed: Residential ..... Business ..... Commercial ..... Agric. X
4. No. of bedrooms ..... No. of baths 1½
   No. of persons 2
5. Basement plumbing: yes ..... no X type .....
6. Area of lot (acres) 3.3
7. Subsoil draintile (yes) ..... X ..... (no) .....
8. Type of sewage disp. system requested:
   Septic tank X vault ..... other .....
9. Well (proposed) ..... (installed) .....
10. Water District LEFT HAND WATER

DEPARTMENT USE ONLY

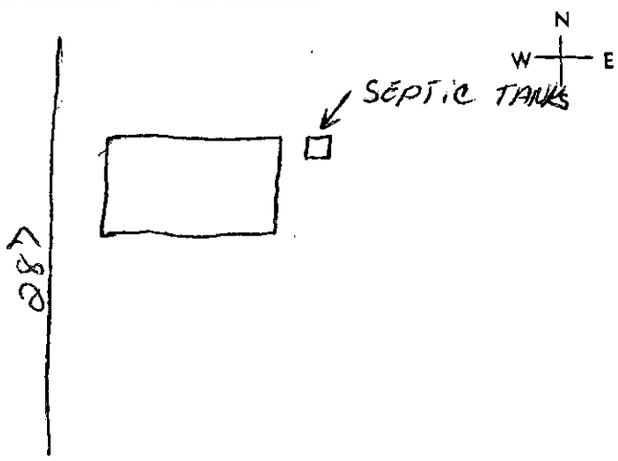
1. Slope 2-4% Waterlines 25'Min
2. Soil Type Sandy Clay
3. Soil perc rate 15 minutes/inch (aver.)
   6' >8'
4. Water table depth ..... Bedrock .....
5. Location of central sewer >1mile
6. Sized for 26 Persons bedrooms (2) persons/bedroom)
   Commercial System.

Please locate on the plot plan below the well location or other type of individual water supply including the house, waterlines, proposed septic area and any streams, ditches, or steep banks on the site.

DETAIL DIRECTIONS TO PROPERTY



DETAIL PLOT PLAN



Owner Signature (Authorized Agent) Barney C. Barnett Date 3-8-91

DEPARTMENT USE ONLY

Permission is hereby granted to the owner or his agent to perform the work indicated below in accordance with the Boulder County I.S.D.S. Regulations. This permit is to remain in full force for **one year from date,** unless revoked for non-compliance. Plans and specifications of proposed sewage-disposal system when reviewed and attached to this permit have been considered satisfactory. Approval is given if this building site meets existing Zoning and/or Subdivision regulations of Boulder County as they apply in this specific case.

MINIMUM REQUIREMENTS

Install: Septic Tank 1,000 gals. / Vault *** / Other ****

Absorption Field 480sq.ft./Trench sq. ft., OR
**** feet of trench three feet wide.
No one trench/line may exceed 100 feet.

Installation Instructions Install system per H.E. Donnelly design and drawing # 91-108, dated 3/9/91, and all Boulder County ISDS reg's. Bottom of gravel in absorption trenchs must not be installed deeper than 2' below original grade. Maintain all required distances with referance to the installed system. Design Engineer must verify suitability of all fill soils. Final inspection of this system is required by this Dept. and the Design Engineer prior to final approval and use of this system.

Authorized Signatures Abraham W. Yarbrough
Owner or Agent Barney Barnett
Installer E-Z Excavating Engineer Approval .....
Final Approval Abraham Yarbrough 4-10-91
(Health Officer—Sanitarian Signature)

Approved by Board of Health .....
Permit Date 3-21-91
Date 3-22-91
Final Inspection 3-28-91

TO OWNER: *Leave entire sewage-disposal system uncovered for final inspection. A final inspection is required for all system installations unless otherwise specified.* **THE HEALTH OFFICER SHALL ASSUME NO RESPONSIBILITY IN CASE OF FAILURE OR INADEQUACY OF A SEWAGE DISPOSAL SYSTEM BEYOND CONSULTING IN GOOD FAITH WITH THE PROPERTY OWNER OR REPRESENTATIVE.**

Environmental Health (9/86)

INDIVIDUAL SEWAGE DISPOSAL SYSTEM

FIELD WORK SHEET

APPLICANT Barry Barrett

LOCATION 5742 N. 107th
(Legal & Specific Area)

TYPE OF SYSTEM REQUESTED _____

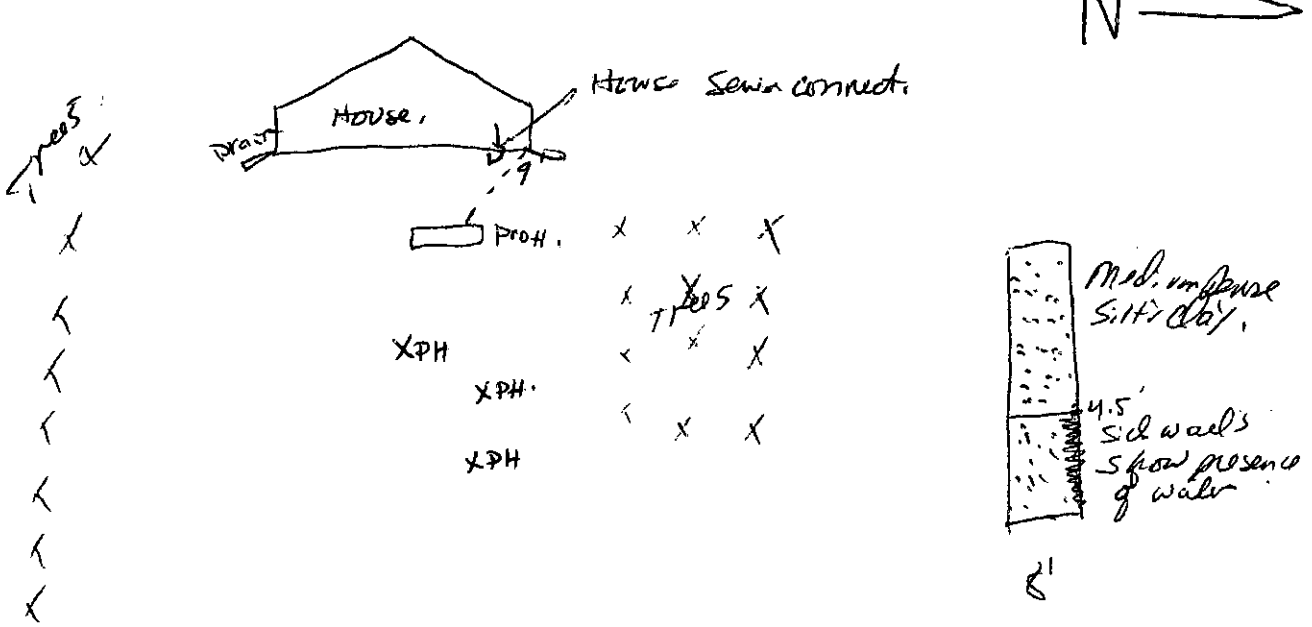
SANITARIAN RECOMMENDATION: Approval ✓ Denial ____ Reason _____

FIELD INSPECTION: Date 3-12-91 Sanitarian Sanf.

1. Perc Rate 15 2. Soil Type Med. dense Silty-clay 3. Slope 2-4%
4. Groundwater Depth ~~4.5~~ 6.0 per Engineer Surface 5. Bedrock Depth >8'
6. Water Supply Lot hookup 7. Distance to Water Lines >25'
8. Lot Size 33 acres. 9. Structure Proposed Office - Complex.
10. Distance to Waterways & Gulleys >50' 11. Density Light.
12. Area for Expansion yes 13. Distance to Wells no wells
14. Municipal Sewer Availability >1 mile 15. History of Area High groundwater.

Sanitarian Comments Max groundwater depth was as 4.5'. 6.0' per engineer.

PLOT OF SITE (include all pertinent features): HW287



SEWAGE DISPOSAL SYSTEM FINAL INSPECTION

Boulder County Health Department

NAME Barney C. Barnett

LEGAL DESCRIPTION 5762 N 107th 287 Sec. 3 T1N R69W

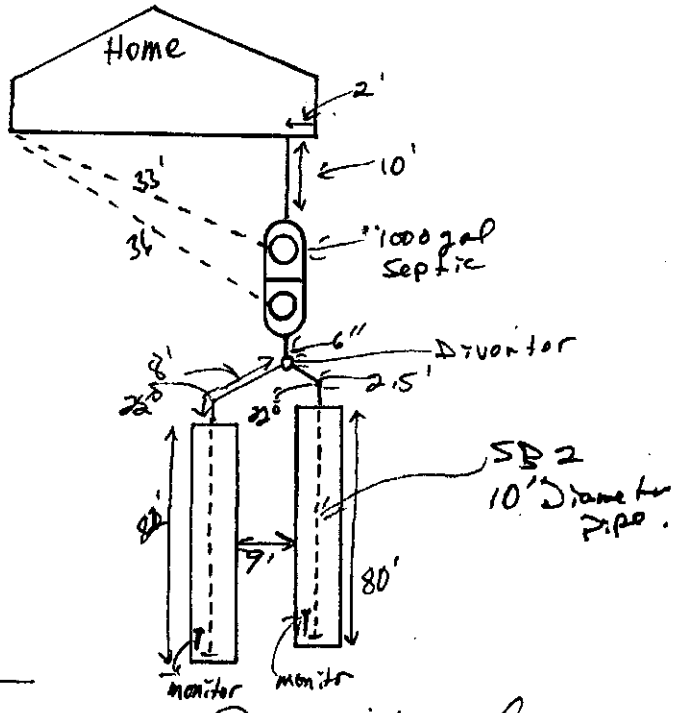
INSTALLER EZ Excavating

SB2 System

System Installed in area of tests Yes
Distribution Box NA Water Leveled NA
Distribution Lines 2 Capped Yes Slope Level
Type of Grouting PVC
Depth of Gravel NA
Paper/Straw Paper
Septic Tank/Aeration Unit Construction 1000gal.
Company Erie Precast
Size Meets Minimum Requirements Yes 162 Lin. ft.
Distance to Wells No wells on property left hand water
Distance to Streams/Ditches 250'
Depth of Fill Under System per Eng. Adequate Shoulder Yes
Depth of System Per Eng.
Other

SCHEMATIC OF SYSTEM (Location, House, Direction, Distances)

N →



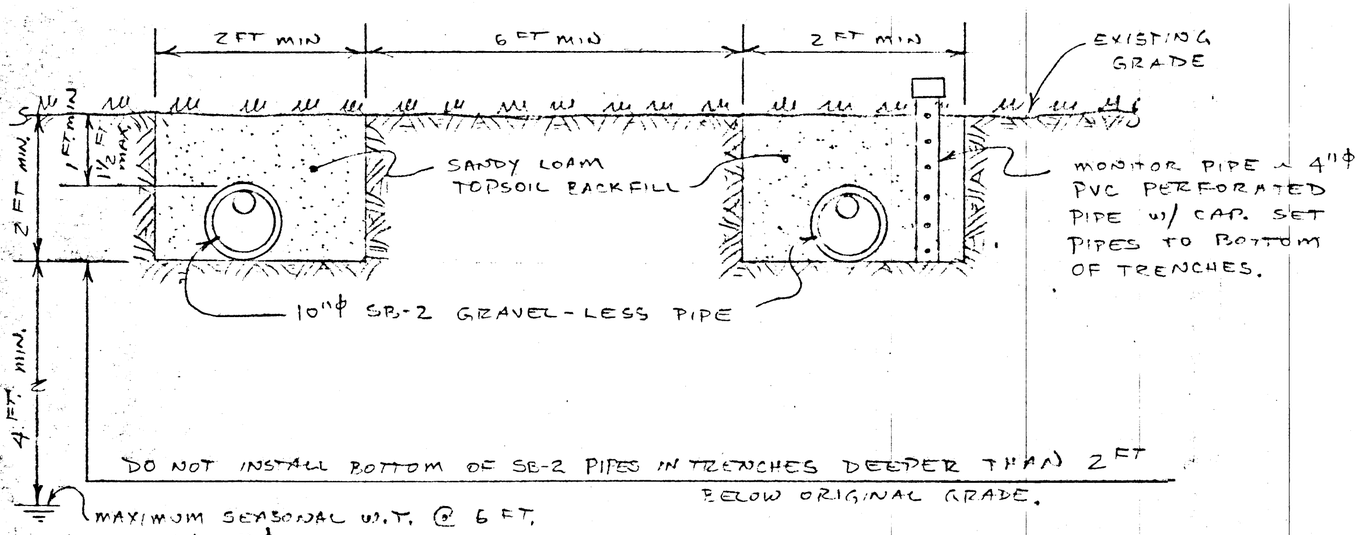
APPROVED ✓

DENIED REASON ① Permit pending Engineer approval & System and fill soils.

DATE 3-28-91

Inspected By

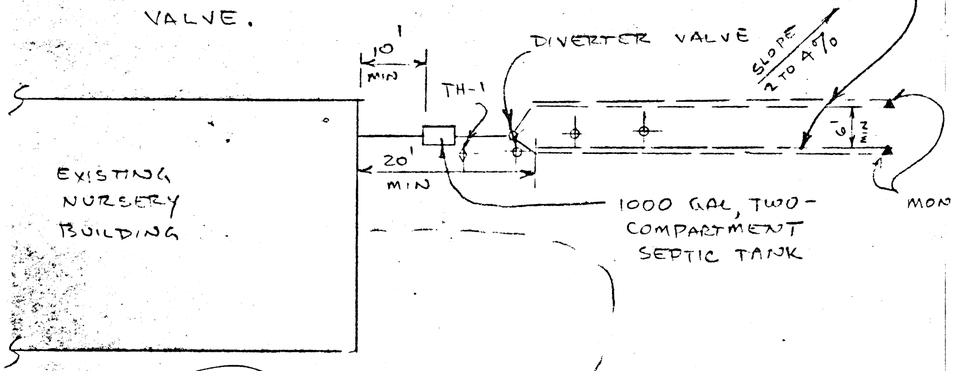
3/79 - 214



TYPICAL 10"ϕ SB-2 GRAVEL-LESS PIPE ABSORPTION TRENCH CROSS SECTION

NOT TO SCALE

TWO TRENCHES w/ 80 L.F. OF 10"ϕ SB-2 GRAVEL-LESS PIPE IN EACH TRENCH (TOTAL 160 L.F.) ~ TOTAL EQUIVILENT AREA = 480 SQ. FT. DO NOT INSTALL BOTTOM OF PIPE DEEPER THAN TWO FT. BELOW ORIGINAL GRADE. ALTERNATE TRENCHES EVERY 3 TO 6 MONTHS BY SWITCHING THE DIVERTER VALVE.



NOTE: NO WELLS ~ LEFT HAND WATER SUPPLY.

N

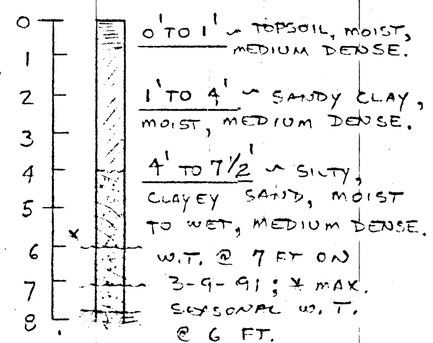
NOT TO SCALE ~ APPROX. ELEV. ≈ 5060 FT.

SITE PLAN

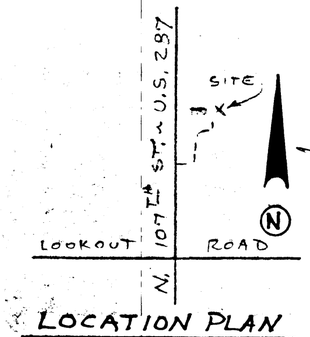
5762 N. 107TH STREET, U.S. 287, AN 80± ACRE TRACT LOCATED IN THE SE¼ OF SECTION 3, T1N, R69W OF THE 6TH P.M., BOULDER COUNTY, COLORADO.

DEPTH IN FEET — DESCRIPTION

TH-1



SOIL PROFILE INFO



LOCATION PLAN

1" = 2000'

GENERAL SPECIFICATIONS

1. All construction shall be in compliance with the Boulder County Individual Sewage Disposal System Regulations and US Public Health Service Publication No. 526, "Manual of Septic Tank Practice".
2. All lines in the absorption bed shall be 4" diameter PVC perforated pipe.
3. Planting of deep rooted grass (i.e. Fairway Crested Wheatgrass) over the absorption field area is required within 3 months of installation of the system.
4. No trees or shrubs are to be located within 10 feet of the system.
5. All portions of the absorption bed shall be located a minimum of 20 feet from any building, 10 feet from the property line, 50 feet of any stream, 100 feet from any well or spring and 25 feet from any water line.
6. No chemicals shall be disposed of in the system.
7. No foundation perimeter drain or sump, swimming pool, water softener, hot tub, jacuzzi or spa shall be emptied, backwashed or discharged into the system.
8. No portion of the system is to be paved or driven over.
9. The contractor shall contact the Design Engineer prior to laying out the system and shall verify the property lines, water lines and required setbacks before commencing construction.
10. The system shall be inspected by the Boulder County Health Department and the Design Engineer after placement of the septic tank, gravel and tile and before backfilling any portion of the system.
11. No changes in the dimensions or layout shown on this plan shall be made without prior written approval of the Design Engineer and the Health Department.
12. All surface water runoff drainage shall be diverted around or away from the absorption bed area.

DESIGN CRITERIA:

Tree nursery with maximum 26 day workers, 26 persons at 15 GPD = 390 GPD

Maximum daily flow = 390 GPD x 150% = 585 GPD

Percolation test results by Design Engineer on 3-9-91: PH-1 = 16 min/inch; PH-2 = 16 min/inch; Avg. 15 MPI; PH-3 = 12 min./inch

Design at 15 MPI

Area reqd. = $\frac{Q\sqrt{t}}{5} = \frac{585\sqrt{15}}{5} = 453$ sq. ft.

Install 480 sq. ft. (equivilent area) of 10 inch SB-2 gravel-less pipe. Do not install bottom of 10 inch SB-2 gravel-less pipe in trenches deeper than two foot below original grade on the uphill side.

DESIGN REQUIREMENTS:

Install a 1000 gallon, two-compartment septic tank (41 hours retention)

Install two trenches with 80 L.F. of 10 inch SB-2 gravel-less pipe in each trench (total 160 L.F.). Do not install bottom of gravel-less pipe deeper than two foot below original grade. Install diverter valve and alternate trenches every 3 to 6 months by switching the diverter valve.

Total equivilent area furnished = 480 sq. ft.

NOTE:

This design is based upon information furnished by the owner as to maximum daily flow of sewage, location of property lines, water lines, house and improvement locations. The Design Engineer shall be notified if any of these items or locations are changed. The design of this system is voided if the maximum daily flow of sewage exceeds the volume stated above. The certification of this design is voided if the owner does not provide maintenance of this system in accordance with the Individual Sewage Disposal System Regulations and have the septic tank pumped every three years, or as required. Pumping receipts shall be made available to the Boulder County Health Department upon request.

NOTE: THE SYSTEM SHALL BE INSTALLED BY A CONTRACTOR LICENSED BY THE BOULDER COUNTY HEALTH DEPARTMENT.

HAROLD E. DONNELLY — REGISTERED — 7134 — PROFESSIONAL ENGINEER — STATE OF COLORADO

3-9-91

DWG. 91-108

INDIVIDUAL SEWAGE DISPOSAL SYSTEM

RAINBOW NURSERY ~ BARNEY BARNETT ~ 5762 N. 107TH STREET, U.S. 287, AN 80± ACRE TRACT LOCATED IN THE SE¼ OF SECTION 3, T1N, R69W, BOULDER COUNTY, COLORADO.

10"ϕ SB-2 GRAVEL-LESS PIPE ABSORPTION TRENCH

HAROLD E. DONNELLY, P.E.-L.S. No. 7134
617 ORD DRIVE, BOULDER, COLO. 80303
499-6117

9 MARCH 1991

DocuSign Envelope ID: 9BB167F8-69DB-4DD0-8461-47E08C32696F Area 3 ON50863 KEY OWTS prop-trans

RECEIVED APR 06 2018 ENVIRONMENTAL HEALTH

Boulder County Public Health

ONSITE WASTEWATER TREATMENT SYSTEM (OWTS) Property Transfer Inspection Report

FEE #50.00 #2547

Name of Owner:	Date of Inspection: 4-4-18
Inspection Ordered By: Loren Frederick	Name of Inspector: Stephen Steffek
Site Address: 5762 N. 107th St	Inspector's Certification No: 7939 ITC
Owner's Phone: 918-260-7192	Inspector's Address: 14497 Gold Hill Rd.
Property Legal Description: 03-1N-69W	Inspector's Phone: 303-459-1106
Send Inspection Report To:	Inspector's E-mail: acmeinc.87@gmail.com
Mailing or Email Address: lorvil25@aol.com, holly@klrealty.net	
Size of Property (i.e. # of acres): MSTONEBRAKER@BOULDERCOUNTY.ORG	
Type of Existing Building or Structure (if commercial, list all uses or tenants): Commercial	

Conditional

I. GENERAL INFORMATION (TO BE COMPLETED AND SIGNED BY OWNER)

1. Age of OWTS: 27 years
2. Water Softener ☐ Yes ☑ No
   Garbage Disposal ☐ Yes ☑ No
   Grease Trap ☐ Yes ☑ No
3. Residential ☐ Yes ☑ No
   Commercial ☑ Yes ☐ No
   Flow Meter ☐ Yes ☑ No
   In-Home Business ☐ Yes ☑ No Type:
4. Number of Bedrooms in House 0
   Number Listed on OWTS Permit NA ☑ PASS ☐ FAIL
   Number Listed in Assessor's Records NA
   House Currently Unoccupied NA ☐ Yes ☐ No How long?
5. Has a sewage backup ever occurred? ☐ Yes ☑ No
6. List any known repairs to system
7. Is there a service contract for system components? ☐ Yes ☑ No Company:
8. Date septic tank last pumped: 2015 Frequency: Company:
   (Attach pumping receipt)
9. Water supply supplied by a well? ☐ Yes ☑ No
10. Std. potability test sample of well taken? ☐ Yes ☑ No
    Potability test results: NA ☐ PASS ☐ FAIL
    (NOTE: A pass or fail here does not indicate a pass/fail for the inspection)
11. Is this a renewal? (If yes, complete and return this page) ☑ Yes ☐ No

The above information is true to the best of my knowledge.

Owner/Legal Agent: DocuSigned by: [signature] 9235F2019980413... Date: 4/5/2018

II. SYSTEM TYPE: Components of OWTS (complete as required)

1. Pretreatment (Septic Tank) Unit 1: Type Concrete Manufacturer EPC Capacity (gal) 1000
2. Pump Tank 1: Capacity (gal) NA
3. Pretreatment/Treatment Unit 2 Type NA Manufacturer NA Capacity (gal) NA
4. Pump Tank 2: Capacity (gal) NA
5. Soil Treatment Unit: Type: Absorption Trenches Area (Ft²) 161 LF
6. Vault *(see instructions)* Type NA Manufacturer NA Capacity (gal) NA

Warning Device ☐ **PASS** ☐ **FAIL**

Pumping Receipts (vault only) ☐ **Yes** ☐ **No**

Location of warning device: _____

7. Additional Components: _____
8. Greywater Discharge (if separate from OWTS): ☒ None ☐ Surface ☐ Subsurface ☐ Tank
   ☒ PASS ☐ FAIL

III. EVALUATION PROCEDURES

1. **Number of bedrooms counted in house:** 0
   Number of bedrooms doesn't exceed OWTS record: ☒ PASS ☐ FAIL
2. Locate, access, and open the septic tank cover: ☒ PASS ☐ FAIL
3. If at grade, is tank cover secure? ☒ PASS ☐ FAIL
4. Can surface water infiltrate into tank(s)? ☒ No/PASS ☐ Yes/FAIL
5. Any indicators of previous failure? ☐ Yes ☒ No
6. Inspect lid; measure sludge and scum level: ☒ Yes ☐ No
7. Inspect effluent screen (if applicable): ☐ Yes ☒ No
8. Run an operation test:
   a. Gallons added in the operation test: 200 gallons
   b. Does water backflow into tank? ☒ No/PASS ☐ Yes/FAIL
9. Pump out primary treatment (septic) tank: ☒ Yes ☐ No/FAIL
   a. How many gallons? 0 gallons
10. Inspect the condition of the septic tank: ☒ PASS ☐ FAIL
    a. Inspect condition of inlet and outlet baffles ☒ Yes ☐ No
    b. Comments (cracks, deterioration, infiltration, or damage): _____
11. Does the system contain a dosing or pump tank, ejector, or grinder pump or an Advance Treatment Unit (ATU)? ☐ Yes ☒ No
    a. If so, was the condition of the tank checked? ☐ Yes ☐ No

    Comments: _____

    b. Is the pump elevated off the bottom of the tank? ☐ Yes ☐ No ☐ NA
    c. Does the pump work? ☐ Yes/Pass ☐ No/Fail ☐ NA
    d. Is there a check valve or purge hole present? ☐ Yes ☐ No ☐ NA
    e. Is there a high water alarm? ☐ Yes ☐ No ☐ NA
    f. Does the alarm work? ☐ Yes/Pass ☐ No/Fail ☐ NA
    g. Type of alarm: ☐ Audio ☐ Visual ☐ Both
    h. Do electrical connections appear satisfactory? ☐ Yes ☐ No
    i. Was the pump/ATU tank cleaned? ☐ Yes/Pass ☐ No/Fail
    j. If an ATU, is the motor working? ☐ Yes/Pass ☐ No/Fail
    k. If an ATU, is there a current operation & maintenance agreement in place? ☐ Yes ☐ No
12. Was the soil treatment area probed to determine its location and to check for excessive moisture, odor, and/or effluent? ☒ Yes ☐ No
    a. Any area subject to serious erosion? ☐ Yes ☒ No

b.	Any area subject to compaction?	☒ Yes	☐ No
c.	Any indication of previous failure?	☐ Yes	☒ No
d.	Seepage visible on the surface of the field?	☒ PASS	☐ FAIL
e.	Is improper vegetation present?	☐ Yes	☒ No
f.	Heavy saturation in the distribution media?	☐ Yes	☒ No
g.	Even distribution of effluent in the field?	☒ Yes	☐ No
h.	Snow cover over the absorption area?	☐ Yes	☒ No
i.	Irrigation present on absorption area?	☐ Yes	☒ No

13. Distance between water well and soil treatment area: city water Feet

14. Inspection results of OWTS:

☒ Acceptable (no repairs required) ✓

☐ **Unacceptable (repairs required)**

☐ **Repairs required**

Explain/define repairs needed or repairs made: As per the seller, all the water pipes had frozen just after the purchase (December 2015) of this property and has not been used since. The septic tank is still empty from when it was pumped at that time. The tank appears to be in good shape with no apparent cracks or holes. The diverter valve needs a 4" PVC screw on cap that is currently missing. Recommend placing a water alarm near the lowest drain in the home. Recommend keeping all trees a minimum of 10 ft. from the septic system.

By signing this form, I hereby verify that I am a NAWT or NSF-certified inspector who personally conducted the inspection of this property.

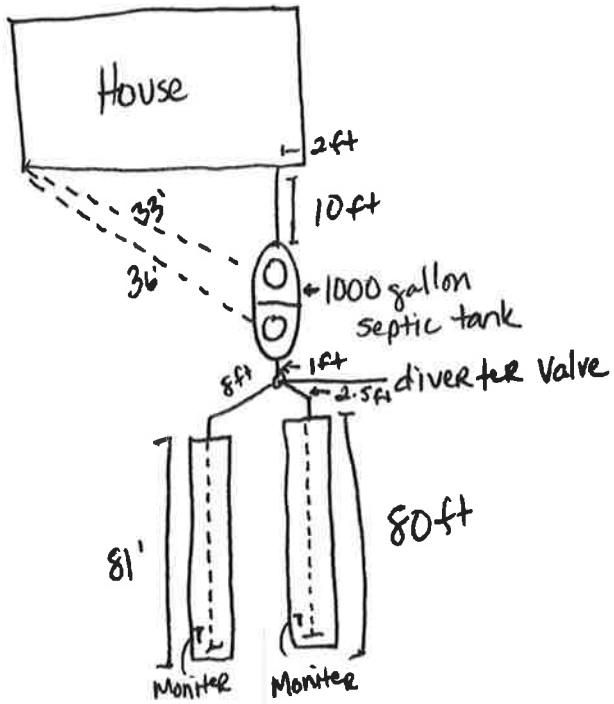
Certified Inspector Signature: _____ Date: 4-5-18 ✓

IV. SKETCH OF SYSTEM

Make an accurate sketch of the entire system that shows the location of the dwelling or structure with two triangulated distance measurements to the septic tank lid(s) or GPS coordinates. Include sewer location to structure, septic tank(s), lift station, and soil treatment area. Include all pertinent setback locations, such as lakes, rivers, irrigation ditches, and water wells.

Note: BCPH is no longer accepting final drawings from existing OWTS permits.

N →



Property Report for Account R0037656

Today's Date: 4/6/2018

Property Address:	5762 N 107TH ST
City:	UNINCORPORATED
Owner:	FREDERICK LOREN D
Parcel Number:	146503000004
Mailing Address:	PO BOX 1000
City, State, Zip:	BIXBY OK, 74008
Sec-Town-Range:	03 -1N -69
Subdivision:	EAST COUNTY
Jurisdiction:	Unincorporated Boulder County
Legal Description:	21.64 ACS M/L IN NW 1/4 SE 1/4 3-1N-69 LESS 1.36 ACS M/L TO HWY DEPT PER DEED 1061409 8/90 NCWA C1640 4 AFU SPLIT TO ID 109694 CONSERV ESMT 12/94 REC 1485777
Square Feet:	930,519
Acres:	21.36

Assessment Report for Account R0037656

Today's Date: 4/6/2018

Account

Account Number:	R0037656
Parcel Number:	146503000004
Tax Area:	004531
No. of Improvements:	2
Site Address:	5762 N 107TH ST
Neighborhood:	EASTERN PLAINS

Deeds

Deed#	Sale Date	Recorded	Sale Price

Total Account Value

	Actual	Assessed
Total:	103900	29085
Structure:	77800	21516
Land:	26100	7569
X-Features:	0	0
MillLevy:	83.753	

Improvements

Section:	1
Class:	OTHER BLDGS.-AGRICULTURAL
Built:	1990
Design:	STORAGE WAREHOUSE

Number of rooms:

Total:	0
Bedrooms:	0
Full Bath:	0
3/4 Bath:	0
Half Bath:	0

Areas of levels in sq. ft.

DISTRIBUTION WAREHOUSE	3200

Section:	2
Class:	OTHER BLDGS.-AGRICULTURAL
Built:	2000
Design:	GREENHOUSE

Number of rooms:

Total:	0
Bedrooms:	0
Full Bath:	0
3/4 Bath:	0
Half Bath:	0

Areas of levels in sq. ft.

GREENHOUSE (RESIDENTIAL) AREA	3135

CONDITIONAL PROPERTY TRANSFER CERTIFICATE OF OPERATION

is hereby granted to the property located at:

5762 N 107TH ST, LONGMONT, CO 80501

Parcel Number 146503000004

This certificate shall remain valid for the time specified in accordance with required repairs or as outlined in the Agreement for a Repair to an Onsite Wastewater Treatment System (OWTS).

Date Issued: 04/11/2018

Boulder County Public Health

BOULDER COUNTY PUBLIC HEALTH
Opportunity for a healthy life.

Joe M.Malinowski, Environmental Health Division Manager

Boulder County SEPTIC SMART

03650195 04/11/2018 01:35 PM
RF: $0.00 DF: $0.00 Page: 1 of 2
Electronically recorded in Boulder County Colorado. Recorded as received.

Agreement for a Repair to an Onsite Wastewater Treatment System (OWTS)

AGREEMENT made and entered into this 11th day of APRIL, 2018 by Boulder County a body corporate and politic (hereafter Boulder County)

Phone Number: 303-678-6262

who intend to purchase certain real property and improvements ("Property") described as follows:

The property is divided into three legal parcels: 1) Parcel Number 146503000004 - 21.64 ACS M/L IN NW 1/4 SE 1/4 3-1N-69 LESS 1.36 ACS M/L TO HWY DEPT PER DEED. 2) Parcel Number 146503000005 - 9.34 ACS M/L IN NW4SE4 3-1N-69 LESS 0.66 ACS M/L TO HWY DEPT FOR ROAD R/W PER DEED 1061409 8/30/90 BCR SPLIT ID 109693. 3) Parcel Number 146503000006 - 9.11 ACS NW 1/4 SE 1/4 3-1N-69 LESS MINERALS PER DEED 890175 11/23/87 BCR SEE MIN SPLIT 99846 LESS .89 ACS M/L HWY DEPT 105253 8/90 SPLIT 109695

More commonly known and referred to as:
5762 N. 107th Street, Longmont CO. (Rainbow Nursey

Whereas, Boulder County Public Health (BCPH) has determined that the onsite wastewater treatment system on the property is not approved in compliance with the Boulder County Onsite Wastewater Treatment System (OWTS) Regulations, and in its present condition requires repairs to provide on-going protection of public health and the environment; and

Whereas, Purchasers are desirous of proceeding with their purchase of the Property subject to the terms and conditions of this agreement; and

Whereas, failure to comply with the terms of this Agreement will subject the Purchasers to enforcement action; and

Whereas, Purchasers acknowledge that if at any time BCPH determines that the OWTS has become an immediate threat to public health or water quality, a written notice shall be issued to the Purchasers to immediately bring the OWTS into compliance with the Regulations.

NOW, THEREFORE, Purchasers agree as follows:

1. Purchasers agree to apply for a repair permit and complete the repairs to the OWTS servicing the dwelling or occupied building on the Property within 90 days after the closing date.

2. Purchasers acknowledge that their failure to complete repairs will cause Public Health to initiate enforcement actions against them, including injunctive relief precluding the use of the Property unless and until repairs are completed.

3. Boulder County will not use this property and it is to remain vacant for approximately 2 years. If and when the County decides to use this property – a full engineer's report will be submitted to BCPH regarding the proposed use with calculations showing that the existing septic system is adequate.

Purchaser's Signature: _____

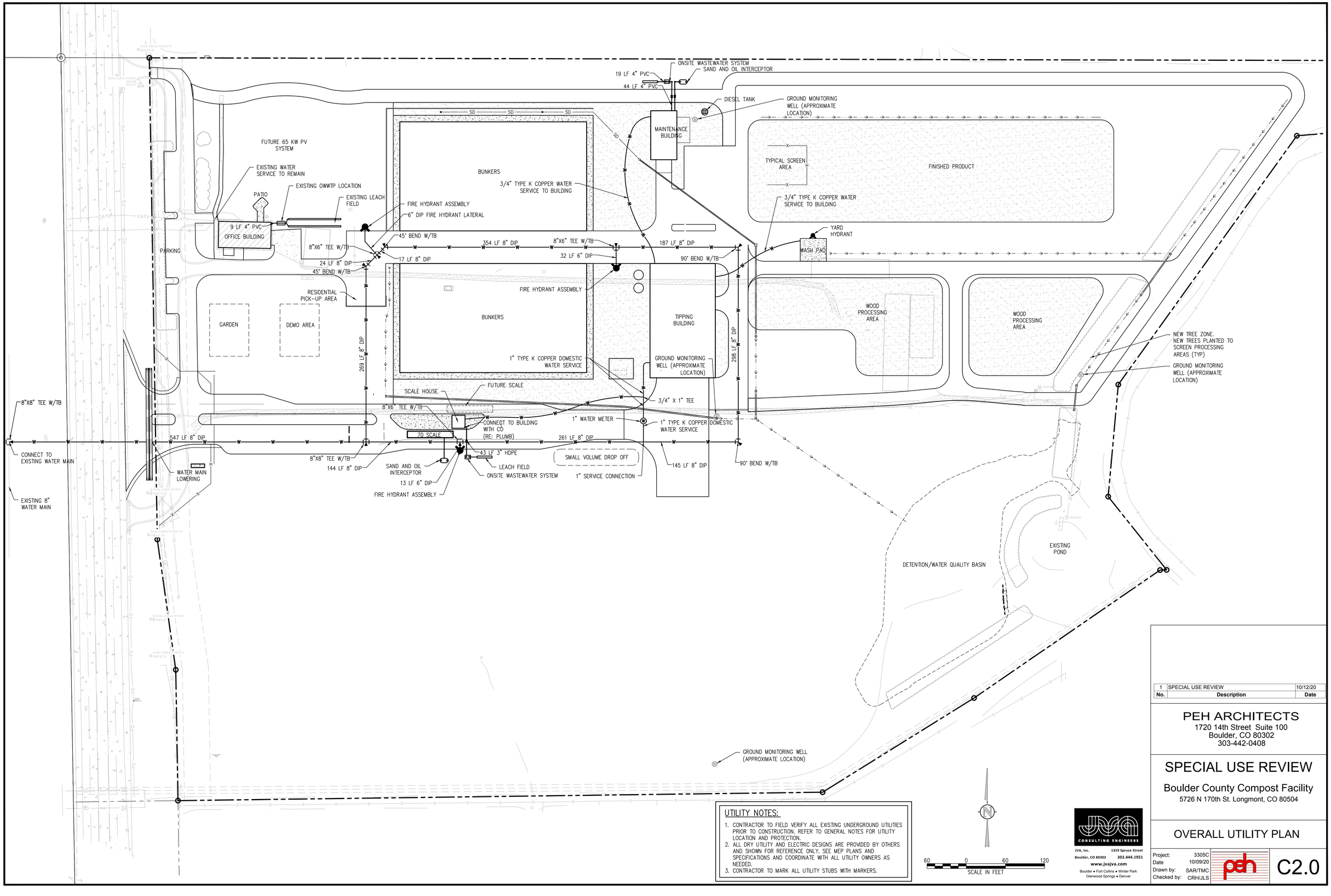
Contact name and phone Mel Stonebraker, Sr. Land Officer – 303-678-6262

STATE OF COLORADO
COUNTY OF BOULDER
The foregoing instrument was acknowledged before me this 11 day of April, 2018
by Mel Stonebraker &.
Witness my hand and official seal.

_____
Notary Public
My Commission Expires: April 4, 2022

HEATHER ANN RANSOM
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20184015121
MY COMMISSION EXPIRES APRIL 4, 2022

ATTACHMENT B – PRELIMINARY SITE PLAN



UTILITY NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ALL DRY UTILITY AND ELECTRIC DESIGNS ARE PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. SEE MEP PLANS AND SPECIFICATIONS AND COORDINATE WITH ALL UTILITY OWNERS AS NEEDED.
3. CONTRACTOR TO MARK ALL UTILITY STUBS WITH MARKERS.

60 0 60 120
SCALE IN FEET

No.	Description	Date
1	SPECIAL USE REVIEW	10/12/20

PEH ARCHITECTS
1720 14th Street Suite 100
Boulder, CO 80302
303-442-0408

SPECIAL USE REVIEW

Boulder County Compost Facility
5726 N 170th St. Longmont, CO 80504

OVERALL UTILITY PLAN

JVA, Inc. 1319 Spruce Street
Boulder, CO 80302 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

Project:	3305C
Date	10/09/20
Drawn by:	SAR/TMC
Checked by:	CRH/JLS

C2.0

ATTACHMENT C – FEMA FIRM MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided by the FEMA Map Service Centerand the Boulder Area Spatial Data Cooperative (BASIC). Additional input was provided by the Town of Erie and the City of Longmont. These data are current as of 2004

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Boulder County Vertical Datum Offset Table

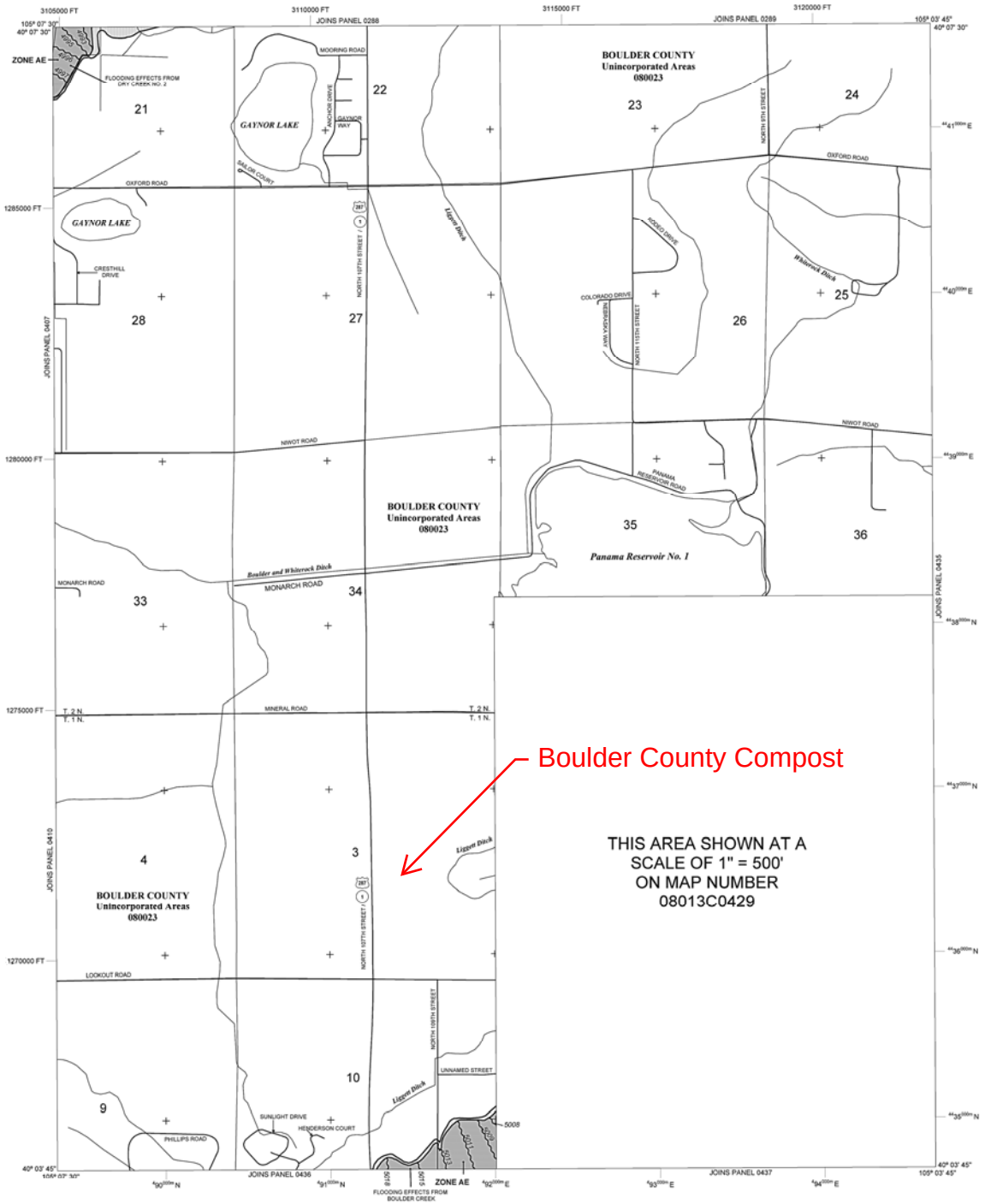
Flooding Source	Vertical Datum Offset (ft)	Flooding Source	Vertical Datum Offset (ft)
Boulder Creek (Confluence of Fourmile Creek to East County Line Road)	3.3	Dry Creek No. 2	3.186

Example: To convert Boulder Creek elevations to NAVD 88, 3.3 feet were added to the NGVD 29 elevations.

Panel Location Map

This digital Flood Insurance Rate map (FIRM) was produced through a cooperative partnership between the State of Colorado Water Conservation Board, the Urban Drainage and Flood Control District, and the Federal Emergency Management Agency (FEMA). The State of Colorado Water Conservation Board and the Urban Drainage and Flood Control District have implemented a long-term approach of floodplain management to reduce the costs associated with flooding. As part of this effort, both the State of Colorado and the Urban Drainage and Flood Control District have joined in Cooperating Technical Partner agreements with FEMA to produce this digital FIRM.

Additional Flood Hazard Information and resources are available from local communities, the Colorado Water Conservation Board, and the Urban Drainage and Flood Control District.



Boulder County Compost

THIS AREA SHOWN AT A SCALE OF 1" = 500' ON MAP NUMBER 08013C0429

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 1 NORTH, RANGE 69 WEST, AND TOWNSHIP 2 NORTH, RANGE 69 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain Boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- *Referenced to the North American Vertical Datum of 1988
- A — A Cross section line
- 23 — 23 Transect line
- 45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4389000 N 1000-meter Universal Transverse Mercator grid values, zone 13
- 3180000 FT 5000-foot ticks: Colorado State Plane North Zone (FIPS Zone 0501), Lambert Conformal Conic projection
- DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 2, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
May 6, 1996 - to incorporate previously issued Letters of Map Revision; to add roads and road names; and to update corporate limits.
October 4, 2002 - to change base flood elevations; to change special flood hazard areas; to change zone designations; to update roads and road names; to reflect updated topographic information; to incorporate previously issued Letters of Map Revision; and to change floodway.
December 18, 2012 - to update corporate limits; to update roads and road names; to add Special Flood Hazard Areas previously shown on Town of Erie, Colorado Flood Insurance Rate Map dated December 2, 2004; and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0430J

FIRM

FLOOD INSURANCE RATE MAP
BOULDER COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 430 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER COUNTY	080023	0430	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08013C0430J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

ATTACHMENT D – WEBSOIL SURVEY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Boulder County Area, Colorado

September 30, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

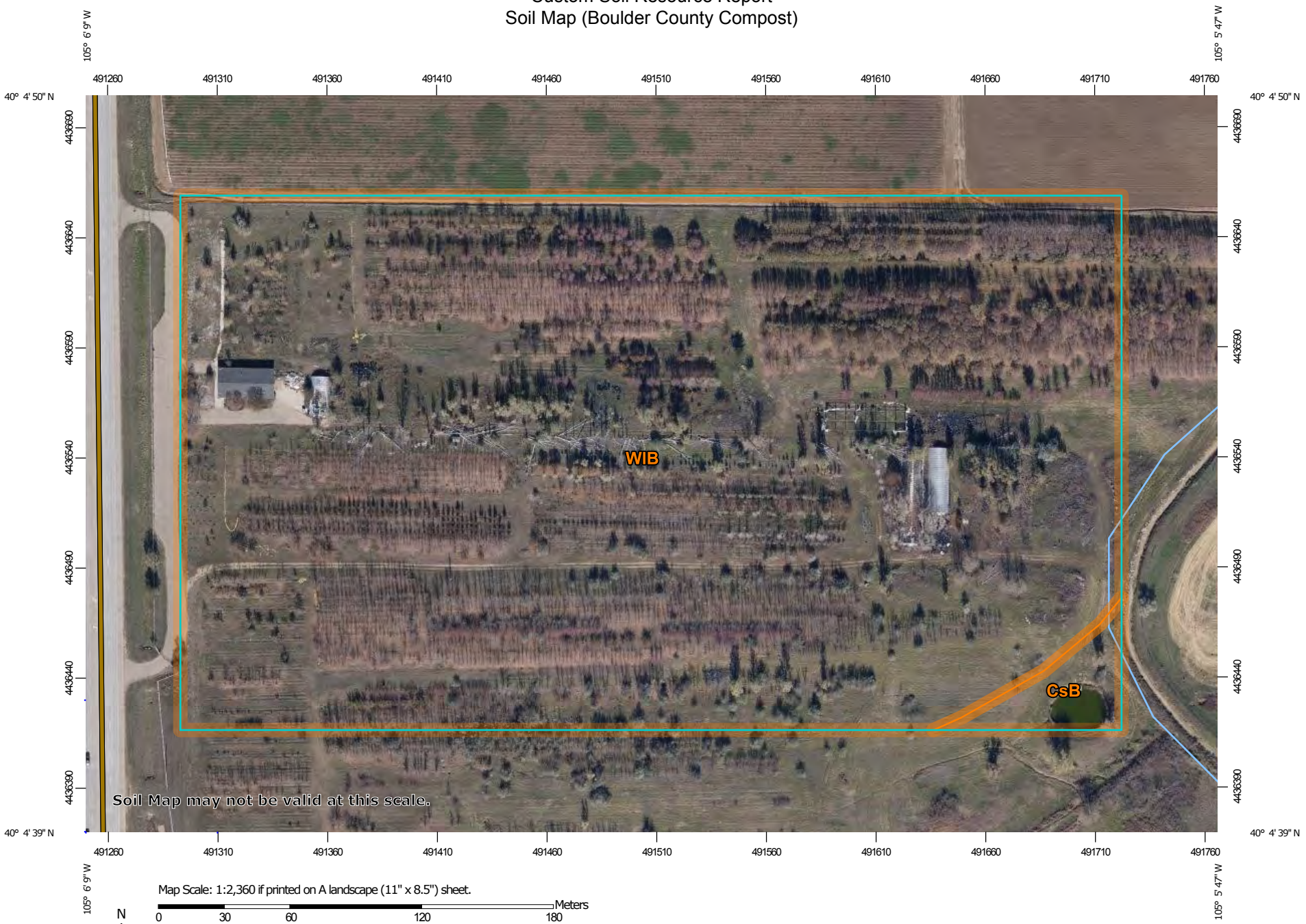
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Boulder County Compost)



Map Scale: 1:2,360 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boulder County Area, Colorado
Survey Area Data: Version 17, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 1, 2018—Oct 31, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Boulder County Compost)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CsB	Colby silty clay loam, wet, 0 to 3 percent slopes	0.5	2.1%
WlB	Weld loam, 1 to 3 percent slopes	25.3	97.9%
Totals for Area of Interest		**25.9**	**100.0%**

Map Unit Descriptions (Boulder County Compost)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Boulder County Area, Colorado

CsB—Colby silty clay loam, wet, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: jprh
Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Colby and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colby

Setting

Landform: Valleys
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Uniform eolian deposits

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 40 inches: clay loam, silty clay loam, silt loam
H2 - 12 to 40 inches: stratified clay loam to silty clay
H2 - 12 to 40 inches:
H3 - 40 to 60 inches:

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 21.1 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Weld
Percent of map unit: 10 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 4 percent
Landform: Swales
Hydric soil rating: Yes

Gaynor
Percent of map unit: 1 percent
Hydric soil rating: No

WlB—Weld loam, 1 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2x0hw
Elevation: 3,600 to 5,750 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 115 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Weld and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weld

Setting
Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loess

Typical profile
Ap - 0 to 8 inches: loam
Bt1 - 8 to 12 inches: clay
Bt2 - 12 to 15 inches: clay loam
Btk - 15 to 28 inches: loam
Bk - 28 to 60 inches: silt loam
C - 60 to 80 inches: silt loam

Properties and qualities
Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Adena

Percent of map unit: 8 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Colby

Percent of map unit: 7 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Keith

Percent of map unit: 3 percent
Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Baca

Percent of map unit: 2 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex

Across-slope shape: Linear, convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

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ATTACHMENT E – EPA CLASS V INJECTION WELL DOCUMENTATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SHALLOW WASTE DISPOSAL SYSTEM/WELL INVENTORY REQUEST FORM

(Form adapted from OMB No. 2040-0042)

Shallow waste disposal systems/wells release waste fluids into or above shallow ground water and include: commercial septic systems, sumps, drain fields, French drains, cesspools, abandoned drinking water wells, dry wells and infiltration galleries. EPA's Underground Injection Control (UIC) regulations require inventory information for all disposal systems/wells and additional information for certain types of systems/wells.

This form is designed to collect basic information for all systems/wells to determine which are used for underground disposal of waste fluids.

- If your business has more than one location within Colorado, please copy and submit an Inventory Request Form for each facility.
- If this is your residence, and your commercial facility is located elsewhere, provide the information for your commercial facility. However, if you work out of your home, please complete and submit this form.
- If you lease or rent the space for your business, as the operator of the business, you are responsible for submitting the inventory information for this facility.

I. IDENTIFICATION OF DISCHARGE/DISPOSAL SYSTEM/WELL

Please circle YES or NO to all items that pertain to the way your business or facility disposes of waste fluids. Waste fluids include wash water, storm water, sanitary waste and spills. If you need assistance completing this form, call Lynne Newton at 800- 227-8917, extension 312-6127 or 303-312-6127.

1.	Is your facility connected to a public sewer system?	YES	NO
2.	Excluding kitchen and bathroom waste, does you facility dispose of any fluids through a connection to septic system with a drain field, including floor drains and utility sinks?	YES	NO
3.	A self-contained holding tank is one that has no overflow line. Are waste fluids from your facility discharged into a self-contained holding tank which is pumped periodically?	YES	NO
4.	Are there any floor drains or sinks in a processing or shop area, engine service or maintenance bay, or vehicle/equipment washing area?	YES	NO
	4a. If yes to question 4, do the floor drains or sinks ever receive fluids?	YES	NO
	4b. If yes to question 4, are the floor drains or sinks connected to a septic system, drain field, French drain, abandoned drinking water well, dry well, or tank with an overflow line?	YES	NO
5.	Is your facility run as a dry shop (no running water, no sewer, or no septic connection)?	YES	NO
6.	Are waste fluids from your facility discharged to a lagoon or pond?	YES	NO
7.	Are waste fluids from your facility discharged to surface waters, lakes, rivers, streams or wetlands?	YES	NO
8.	Are waste fluids from your facility stored and recycled or hauled away? This includes wash water, oil, fuel, solvents, antifreeze, etc. Please list:_____	YES	NO
9.	Does your disposal/septic system have the physical capacity to treat sanitary waste fluids generated by more than 20 people per day?	YES	NO
	9a. What is the designed flow rate of your disposal/septic system? _____		
10.	Are there any cesspools within the property boundary (typically a concrete cylinder with an open bottom and/or perforated sides)?	YES	NO
	10a. If yes, what is the designed flow rate or size of the cesspool? _____		
11.	Are there any drainage systems (such as dry wells, French drains) within the property boundary that collect storm water or surface runoff and discharge it underground?	YES	NO
12.	If you are a veterinary facility, do you use digital x-ray equipment?	YES	NO

SEE OTHER SIDE

II. BASIC INVENTORY INFORMATION

Inventory all disposal systems (such as septic tanks, dry wells, French drains) separately. You may copy this form and use a copy for each system. If more space is needed, attach a separate sheet.

Disposal System #_____	Operating Status: **AC**=Active, **AN**=Abandoned, **UC**=Under Construction, **TA**=Temporarily Abandoned
Disposal System #_____	Please attach a diagram of the system and include the construction design. Latitude and Longitude of Location:
Disposal System #_____	Date of Construction:
Disposal System #_____	Depth of Disposal System/Well:
Disposal System #_____	Average Maximum Volumes of Disposed Fluids: gallons/day
Disposal System #_____	Source and Nature of Disposed Fluids (For example, solvents, waste oil, paint, brake fluid, antifreeze, wash water, snow melt, cooling or boiler blow down water, industrial process waste, miscellaneous spills, bathroom wastes):
Disposal System #_____	Depth of Groundwater (if known):

III. CERTIFICATION

I CERTIFY, UNDER PENALTY OF LAW, THAT THIS DOCUMENT WAS PREPARED UNDER MY GUIDANCE AND SUPERVISION, AND THAT I AM ASSURED THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION REPORTED HERE. TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PRESENTED ABOVE IS TRUE, ACCURATE AND COMPLETE.

Signature: _____ Date: _____

Name: _____ Title: _____ Phone: _____

Name of Facility: _____ Type of Business Facility: _____

Address of Facility: _____ County: _____

Mailing Address (if different than above): _____

Property Owner (if different): _____ Phone: _____

Property Owner Address: _____

Additional Information: _____

_____

More information about EPA and the UIC Class V program can be found at:

- **Protecting Underground Sources of Drinking Water from Underground Injection (UIC):** http://www.epa.gov/uic
- **Septic Systems:** http://www.epa.gov/septic
- **EPA Home:** http://www3.epa.gov

RETURN FORM TO:
US Environmental Protection Agency
Mail Code 8P-W-UIC
Attn: Lynne Newton
1595 Wynkoop Street
Denver, CO 80202-1129

ATTACHMENT F – OPINION OF PROBABLE COST

Job Name: Boulder County Compost Center OWTS
Job Number: 1102e
Date: Oct 2020
By:JRC

OPINION OF PROBABLE COST FOR BOULDER COUNTY COMPOST CENTER OWTS OPTION A				
Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Division 02 - Sitework				
Cleanouts	2	EA	$500	$1,000
4" SDR 18 PVC Gravity Piping	125	LF	$50	$6,300
Soil Treatment Area Infiltration Chambers	15	EA	$120	$1,800
Soil Treatment Area Flushing Assmblies and Observation Ports	4	EA	$150	$600
Seeding	1	LS	$2,500	$2,500
			Sitework Subtotal	$12,200
Division 11 - Equipment				
1,000 gal Concrete Two Compartment Sepitc Tank w/ Effluent Filter	2	EA	$10,000	$20,000
1,000 gal Sand & Oil Interceptor for Maintenance Bay	2	EA	$5,000	$10,000
			Equipment Subtotal	**$30,000**
Division 16 - Electrical				
Electrical Materials	1	LS	$3,000	$3,000
High Water Alarm Float Panel and Float	4	EA	$750	$3,000
			Electrical Subtotal	**$6,000**

Project Subtotal	**$48,200**
Boulder County Permit Fee	$4,779
Contingency (30%)	$14,000
Contractor's OH&P and General Conditions (10%)	$7,000
OWTS Engineering Design Fee	$7,500
Bidding and Construction Administration	$1,500
Project Total	**$83,000**

Job Name: Boulder County Compost Center OWTS
Job Number: 1102e
Date: Oct 2020
By:JRC

OPINION OF PROBABLE COST FOR BOULDER COUNTY COMPOST CENTER OWTS OPTION B				
Description	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Division 02 - Sitework				
Cleanouts	2	EA	$500	$1,000
4" SDR 18 PVC Gravity Piping	100	LF	$50	$5,000
1.5" HDPE Pressure Piping	1500	LF	$50	$75,000
Seeding	1	LS	$2,500	$2,500
			Sitework Subtotal	$83,500
Division 11 - Equipment				
1,000 gal Concrete Two Compartment Sepitc Tank w/ Effluent Filter and pump	2	EA	$10,000	$20,000
1,000 gal Sand & Oil Interceptor for Maintenance Bay	2	EA	$5,000	$10,000
			Equipment Subtotal	**$30,000**
Division 16 - Electrical				
Electrical Materials	1	LS	$10,000	$10,000
OWTS Pump	2	EA	$3,000	$6,000
OWTS Control Panel and Float Tree	2	EA	$2,800	$5,600
High Water Alarm Float Panel and Float	2	EA	$750	$1,500
			Electrical Subtotal	**$23,100**

Project Subtotal	**$136,600**
Boulder County Permit Fee	$1,593
Contingency (30%)	$41,000
Contractor's OH&P and General Conditions (10%)	$18,000
OWTS Engineering Design Fee	$15,000
Bidding and Construction Administration	$2,500
Project Total	**$214,700**

JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
Ph: 303.444.1951
Fax: 303.444.1957

Web site:
www.jvajva.com

E-mail:
info@jvajva.com

October 7, 2020

Mr. Peter Heinz AIA
PEH Architects Inc.
1720 14th Street, Suite 100
Boulder, CO 80302

RE: Utility Evaluation for the Boulder County Compost Facility
JVA Job No. 3305c

Dear Mr. Heinz:

The primary purpose of this utility memo is to address the existing and proposed on-site utilities and connections to utilities, in particular addressing the proposed water system infrastructure needed to serve the proposed Boulder County Compost Facility. This new facility will be located at 5762 N. 107th Street in Longmont, CO 50504 at the old Rainbow Nursery/Tree Farm.

BACKGROUND AND EXISTING INFRASTRUCTURE

The existing building on the property is served by the Left Hand Water District via a tap of unknown size that is fed from the existing 8" water main on the west of Highway 287. There is also an onsite septic system for the existing building.

PROJECT DESCRIPTION

Boulder County is proposing to remodel the existing building on site and construct three utility buildings on site totaling approximately 21,000 square feet (SF). These buildings include: a scale house, tipping building and maintenance building. The site will also have 16 bunkers where the compost is processed, a wood processing area, a finished product storage area, a truck scale and paved and unpaved access roads throughout the site.

DOMESTIC WATER SERVICES

The design team has had initial contact with Left Hand Water District and Mountain View Fire Rescue to discuss the options for providing water service to the site from the water main on the west side of Highway 287 (See Appendix B). From these meetings, a looped system was recommended. JVA offered the solution of having only one crossing of Highway 287 and looping the water line on the site from that single crossing. Mountain View Fire District verbally agreed to that solution. The scale/tipping and maintenance buildings will require two new water meters. These are shown as a 1" service for the scale/tipping building and a ¾" service for the maintenance building.

At this date, Left Hand Water District is still calculating the flow information at this site. Based on the calculated fire demand, JVA has determined that an 8" water line will be required to serve the three new fire hydrants proposed on site.

Final water system modeling, tap fees, easement dedications, and other requirements will be determined as the project proceeds forward.

FIRE SERVICES

LuAnn Penfold from Rocky Mountain Fire Rescue provided initial feedback about the proposed buildings on September 1, 2020. From this feedback, the design team has determined that none of the buildings will require fire sprinklers. Based on the building type and size, three fire hydrants with a minimum spacing of 450 feet and a minimum required fire flow of 2,750 GPM for two hours are required. The three hydrants have been shown on an 8" looped water main within the site.

IRRIGATION

Boulder County informed the design team on October 7, 2020 that it owns shares of water rights in the Boulder and White Rock Ditch Company and the Northern Colorado ditch. A portion of these water rights will be used to irrigate the existing trees that will remain on site and the proposed landscaping.

SANITARY SEWER SERVICE

Sanitary sewer service will be managed by an onsite wastewater treatment system (OWTS) which is detailed in a separate report included with the Boulder County application.

NEXT STEPS

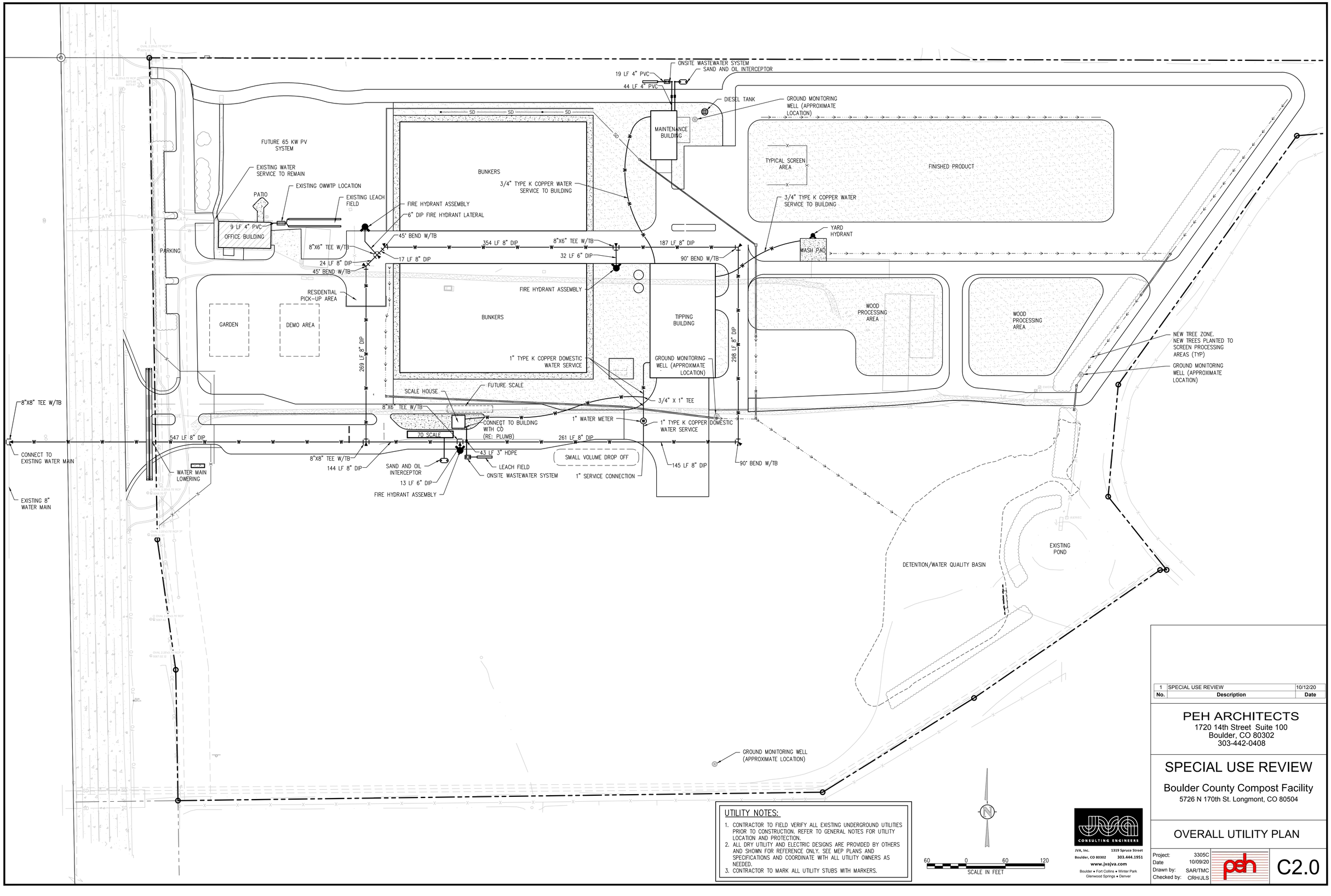
Detailed design of utility infrastructure will be developed as the project moves forward, including further coordination with the various entities (Left Hand Water District, Mountain View Fire Rescue, Boulder County, Northern Colorado and Boulder and White Rock Ditech Companies, etc.)

Sincerely,

JVA, INCORPORATED

By: _____
J.R. Spung, P.E.
Project Manager

APPENDIX A – OVERALL UTILITY MAP



UTILITY NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REFER TO GENERAL NOTES FOR UTILITY LOCATION AND PROTECTION.
2. ALL DRY UTILITY AND ELECTRIC DESIGNS ARE PROVIDED BY OTHERS AND SHOWN FOR REFERENCE ONLY. SEE MEP PLANS AND SPECIFICATIONS AND COORDINATE WITH ALL UTILITY OWNERS AS NEEDED.
3. CONTRACTOR TO MARK ALL UTILITY STUBS WITH MARKERS.

60 0 60 120
SCALE IN FEET

No.	Description	Date
1	SPECIAL USE REVIEW	10/12/20

PEH ARCHITECTS
1720 14th Street Suite 100
Boulder, CO 80302
303-442-0408

SPECIAL USE REVIEW

Boulder County Compost Facility
5726 N 170th St. Longmont, CO 80504

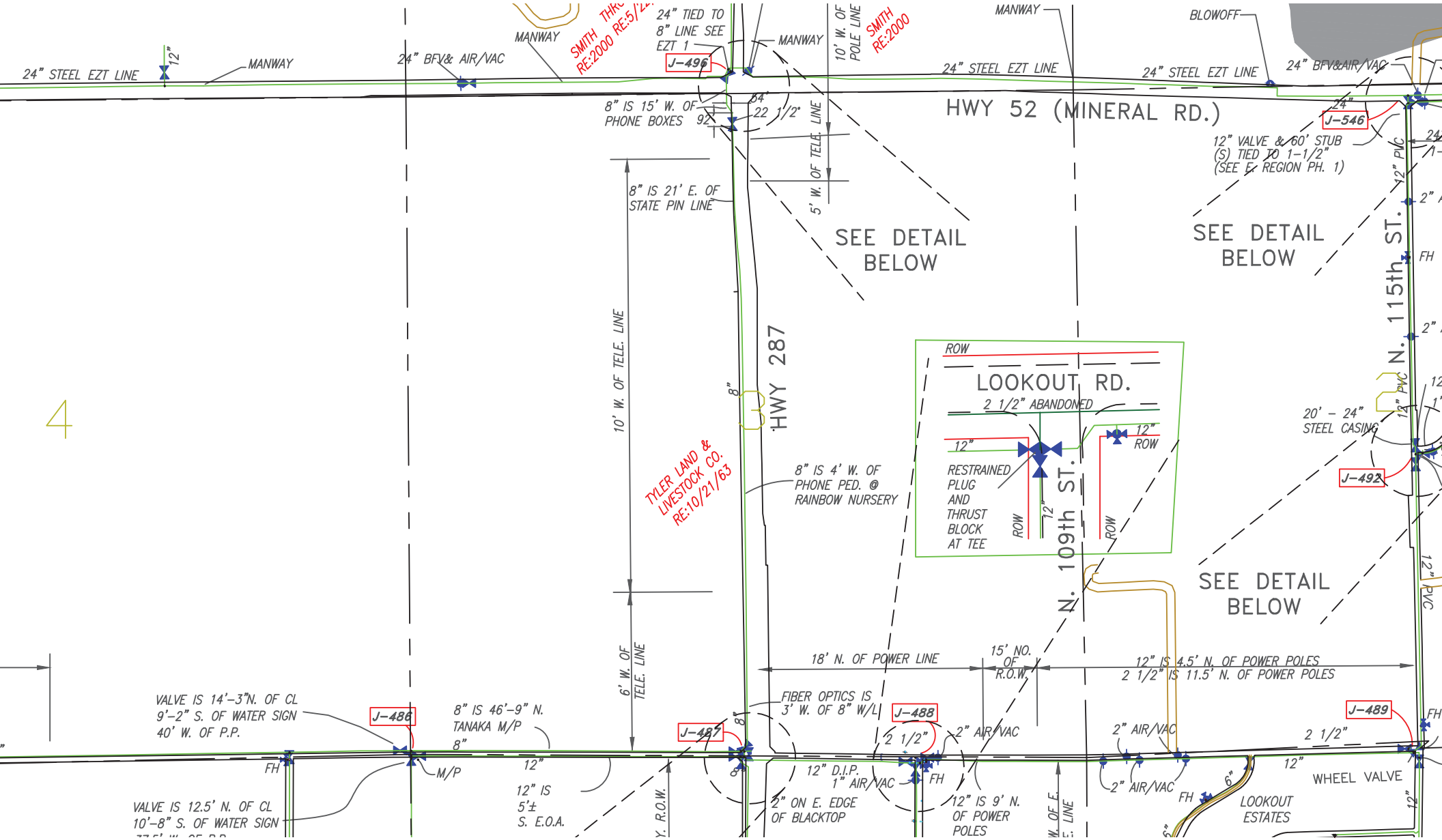
OVERALL UTILITY PLAN

JVA, Inc. 1319 Spruce Street
Boulder, CO 80302 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

Project:	3305C
Date	10/09/20
Drawn by:	SAR/TMC
Checked by:	CRH/JLS

C2.0

APPENDIX B – LEFT HAND WATER SYSTEM GIS MAP


24" STEEL EZT LINE
MANWAY
24" BFV& AIR/VAC
SMITH THK RE:2000 RE:5/2
24" TIED TO 8" LINE SEE EZT 1
J-496
10' W. OF POLE LINE
SMITH RE:2000
BLOWOFF
HWY 52 (MINERAL RD.)
8" IS 15' W. OF PHONE BOXES
64'
22 1/2°
5' W. OF TELE. LINE
J-546
12" VALVE & 60' STUB (S) TIED TO 1-1/2" (SEE E. REGION PH. 1)
SEE DETAIL BELOW
8" IS 21' E. OF STATE PIN LINE
10' W. OF TELE. LINE
HWY 287
N. 115th ST.
12" PVC
FH
20' - 24" STEEL CASING
TYLER LAND & LIVESTOCK CO. RE:10/21/63
8" IS 4' W. OF PHONE PED. @ RAINBOW NURSERY
ROW
LOOKOUT RD.
2 1/2" ABANDONED
12"
RESTRAINED PLUG AND THRUST BLOCK AT TEE
J-492
N. 109th ST.
6' W. OF TELE. LINE
18' N. OF POWER LINE
15' NO. OF R.O.W.
12" IS 4.5' N. OF POWER POLES
2 1/2" IS 11.5' N. OF POWER POLES
VALVE IS 14'-3" N. OF CL 9'-2" S. OF WATER SIGN 40' W. OF P.P.
J-486
8" IS 46'-9" N. TANAKA M/P
FIBER OPTICS IS 3' W. OF 8" W/L
J-487
J-488
J-489
2" AIR/VAC
2 1/2"
M/P
12" D.I.P.
1" AIR/VAC
12" IS 9' N. OF POWER POLES
WHEEL VALVE
LOOKOUT ESTATES
VALVE IS 12.5' N. OF CL 10'-8" S. OF WATER SIGN
12" IS 5'± S. E.O.A.
2" ON E. EDGE OF BLACKTOP

PRELIMINARY STORMWATER REPORT

FOR

BOULDER COUNTY COMPOST FACILITY

AT

5762 NORTH 107TH STREET,
UNINCORPORATED BOULDER COUNTY

FOR

PEH ARCHITECTS

October 12, 2020

October 12, 2020

Community Planning and Permitting
Boulder County Transportation Department
2045 13th Street,
Boulder, CO 80304

RE: Preliminary Stormwater Report – Boulder County Compost Facility
5762 North 107the Street Unincorporated Boulder County
JVA No. 3305c

Summer:

The following Preliminary Stormwater Report and attached drainage maps have been prepared for the above referenced project. The Preliminary Stormwater Report and drainage maps have been produced in accordance with the "Boulder County Storm Drainage Criteria Manual" (Revised November 2016).

It is our understanding that the information provided herein meets all requirements of Boulder County. Please contact us if you have any questions regarding this submission.

Sincerely,

JVA, Inc.

Charles R. Hager, IV, P.E.
Principal

CONSULTING ENGINEERS

Engineer's Statement

"I hereby certify that this report for the final drainage design of the Boulder County Compost Facility was prepared by me (or under my direct supervision) in accordance with the provisions of the Boulder County Storm Drainage Criteria Manual (Revised 2016) and the Mile High Flood District Criteria Manual and was designed to comply with the provisions thereof. I understand that Boulder County does not and shall not assume liability for drainage facilities designed by others."

Charles R. Hager, IV
Registered Professional Engineer
State of Colorado No. 37146

PRELIMINARY STORMWATER REPORT

FOR

BOULDER COUNTY COMPOST FACILITY

AT

5762 NORTH 107TH STREET,
UNINCORPORATED BOULDER COUNTY

FOR

PEH ARCHITECTS

1720 14TH ST #100, BOULDER, CO 80302

JVA, Inc.
Consulting Engineers
1319 Spruce Street
Boulder, CO 80302
(303) 444-1951

JVA, Inc. Project No. 3305c

October 12, 2020

PRELIMINARY STORMWATER REPORT FOR BOULDER COUNTY COMPOST FACILITY

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PRELIMINARY STORMWATER REPORT FOR BOULDER COUNTY COMPOST FACILITY

1 – GENERAL LOCATION AND DESCRIPTION

LOCATION

Boulder County is proposing to develop part of the roughly 40-acre site, of Paracel 1, 2, and 3 of a tract of land located in E1/4 of section 3, T1N, R69W of the 6th P.M., County of Boulder, State of Colorado. The site is located east of US Highway 287, approximately a half mile north of Lookout Road. Leggett Ditch bordering the property to the east, US Highway 287 to the west, and rural land bordering north and south. A vicinity map depicting the location of the property is included in Appendix A.

Formally the site hosted Rainbow Nursery and included a single-story building, greenhouses, and numerous trees. There are numerous ornamental trees, one small irrigation pond, and stands of native trees, in addition to areas dominated by introduced grasses and weeds. Piles of plastic nursery pots and other waste have been stockpiled around the old greenhouses and outbuildings. The site is accessed from US Highway 287 by a paved asphalt drive that runs approximately 700 feet along the west border of the site. The drive includes diagonal parking for the site. Gravel roads around the site provide access to the east and northeast portions of the site.

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) mapping confirms the presence of Colby Silty clay loam and Weld loam that corresponds to Hydrologic Soil Group Type C. Type C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure. USDA NRCS mapping for the project area is included in Appendix A.

PROPOSED PROJECT

The existing single-story building will remain but the nursey structures on the site will be cleared/demolished in preparation for the construction of the project. The proposed project will include construction of, approximately, 21,000 square feet (SF) of new building spaces for maintenance, storage, and office. The project will also include gravel and paved roadways, crusher fine trails, gravel and paved parking areas, concrete walks, utility infrastructure, drainage/stormwater quality infrastructure, and landscaping.

The existing access drive from US Highway 287 will be expanded and used to connect to the site. Additional paved drives will loop through the site for heavy compost delivery vehicles. Gravel access roads will provide additional access to the east and northeast portions of the site for maintenance purposes. A new extended detention basin (EDB) will be developed. The EDB will have a multi-functional design intended to blend in with the natural surroundings. The detention pond will be designed to accommodate the 100-year runoff from the entire site. A new storm system will connect runoff on the site and is sized to accommodate the 100-year runoff. The outlet structure at the pond will control the release of runoff to MHFD 40-hour drain time.

2 – HISTORIC DRAINAGE

MAJOR BASIN DESCRIPTION

The project site is located within the Leggett Ditch Watershed. The site slopes from the northwest to the southeast with elevations ranging from approximately 5,077 feet near US Highway 287 to a low of 5,057 feet to the south near Leggett Ditch. Previous grading and clearing of the site for farming has created slopes ranging from 1 to 10 percent across the site.

Stormwater runoff is currently conveyed from the site via sheetflow that is intercepted by the Leggett Ditch, an irrigation pond, and local irrigation laterals across the site. Stormwater runoff eventually flows south and releases to Panama Reservoir No.1 to the north.

The site is not within 100-year floodplain. Floodplain limits have been confirmed on both Boulder County Flood Hazard mapping and Federal Emergency Management Agency (FEMA) mapping, included in Appendix A. The FEMA FIRM panel and County Flood Hazard mapping appear to be consistent with one another.

SUB-BASIN DESCRIPTION

For purposes of historic drainage analysis, the limits of the basins depicted on Exhibit 1 – Historic Drainage Map include the 39.7 acres of the proposed developed parcel. Due to the existing drainage conditions the site is looked at as a single basin, H1. The existing site is characterized as 2.8% impervious.

Basin H1 sheet flows southeast to the Leggett Ditch and irrigation pond and laterals on the site. For the entire 39.7 acre site, the peak runoff rate for the 5-year storm event (Q5) was estimated to be 6.98 cubic feet per second (cfs). The peak runoff rate for the 100-year storm event (Q100) was estimated to be 44.71 cfs. Hydrologic calculations for the historic basins are included in Appendix B and summarized in Table 1 below.

Table 1: Historic Peak Flows

Sub-Basin	Design Point	Area (acre)	5-Year Flow (cfs)	10-Year Flow (cfs)	100-Year Flow (cfs)
H1	1	39.7	6.98	15.18	44.71

3 – DRAINAGE DESIGN CRITERIA

REGULATIONS

The proposed storm drainage facilities for the project are designed to comply with "Boulder County Storm Drainage Criteria Manual" (Revised November 2016) and the Mile High Flood District's Urban Storm Drainage Criteria Manual (USDCM), June 2001 Edition, updated September 2017.

HYDROLOGICAL CRITERIA

Design storm recurrence intervals for this project are consistent with the Boulder County and MHFD requirements for commercial areas: the minor storm will be the 5-year event and the major storm will be the 100-year event for the storm sewer system and for the detention pond the minor and major storms are the 10-year and 100-year, respectively.

The Rational Method (Q=CIA) was used to determine the storm runoff (Q) from the site, with composite runoff coefficients (C) and contributing areas (A) given for design points in sub-basins. Intensities (I) were determined using the Time-Intensity-Frequency Curves per the Boulder County Standards (Table 505, included in Appendix B) and a calculated Time of Concentration (tc). The one-hour point rainfall for the 5-year event is 1.43 inches and 2.70 inches for the 100-year event. Post-development Time of Concentration calculations for each sub-basin, corresponding rainfall intensities, and composite runoff coefficients for each sub-basin are provided in Appendix B. The calculated flows were routed through the site to determine the total flow at respective design points, which are also included in Appendix B.

Best Management Practices (BMP's) for stormwater quality, detention and water quality capture volume adhere to the latest methods in the USDCM. The detention pond has been designed with water quality control volumes (WQCV) in the EDB. The EDB was sized using the UD-Detention Methods from USDCM standards. Detailed detention basin are included in Appendix B.

4 – DRAINAGE FACILITY DESIGN

GENERAL CONCEPT

Proposed storm runoff is conveyed overland via grading and channelized via grasslined swales, culverts, and concrete pans around the buildings. The new conveyed runoff will enter the extended detention basin through two swales, overland flow, and a culvert north of the developed pond. The extended detention basin will accommodate the 100-year runoff from the site and be designed to meet MHFD standards for detention and water quality. The calculated peak outflow to the detention pond is 11.50 cfs for the 5-yr minor storm event the 51.06 cfs for 100-yr major storm event. The runoff from the two compost bunkers are not included in the calculations. The compost bunkers will have Leach 8 treatment systems to treat the runoff and the reclaimed water will be recycled into the compost materials/system.

SPECIFIC DETAILS OF THE DRAINAGE DESIGN

Sub-Basins:

As shown on Exhibit 2 - Developed Drainage Map, the site was divided into seven sub-basins to characterize the peak runoff rates to various design points on the site (A, B, C, D, E, OS1 and OS2). Hydrologic and hydraulic analysis including routing of basins are included in Appendix B. Table 2 below presents a summary of the developed stormwater peak flows based on the rational method.

Table 2: Developed Peak Flows

Sub-Basin	Design Point	Area (acre)	5-Year Flow (cfs)	100-Year Flow (cfs)
A	1	4.08	2.58	8.88
B	2	4.17	3.25	11.27
C	3	5.34	2.01	11.37
D	4	3.46	4.06	19.31
E	5	20.90	9.60	25.63
Total (Routed)			11.50	51.06
OS1	6	0.24	0.07	0.52
OS2	7	1.33	0.27	2.04

Streets and Parking Lots:

The access drive into the site will be paved and a swale will be developed per CDOT standards to manage runoff. The grading design will maintain the capacity of the exist roadside channel along US 287. The access drive to the site, the loop through the property, and the associated parking will be paved with asphalt. Walks and concrete pans will be scattered around the site near the compost bunkers and the Boulder County Compost facility office. The eastern most portion of the property

and near the designated compost maintenance buildings will have gravel to access the remainder of the developed site.

Open Channel Flow:

Swales are dispersed through out the site to connect islands of gravel and landscape areas to the pond to the southeast. The swales run generally northwest to southeast, remaining consistent with historic drainage patterns. These swales will be sized and modified to fit the 100-year storm conveyance flows. Calculations will be provided in the final drainage report of the developed site.

Storm Sewers:

Near compost bunkers and areas of open field (where separated by paved drives) culverts are shown. Culverts will connect the drainage from the northwest to the southeast. Pipe sizes will be consistent with the 100-year storm conveyance flows. The compost bunker runoff will be treated with a Leach 8 system and will not convey to the onsite detention or storm system.

Detention Ponds and Water Quality Outlet Structures:

The extended detention basin will be designed with an outlet structure that has a total water quality capture volume (WQCV) of 11,848 cubic feet (0.272 acre-feet). The detention basin will include a outlet structure to control minor and major storm runoff to historic runoff rates and provide water quality capture volume per MHFD. Detention basin calculation details are included in Appendix B.

Stormwater Management Plan:

The Stormwater Management Plan (SWMP) will be included in the final engineering plans, with all structural and non-structural Best Management Practices (BMP's) shown as required.

STRUCTURAL BMP'S

Temporary structural erosion control features will be established during overlot grading and prior to the building construction. All erosion control measures will be maintained until vegetation becomes established. Vehicle tracking control and inlet protection BMP's will be included on the construction plans. Silt fencing, inlet and outlet protections, and sediment control logs will be installed at critical locations on the site with respect to existing and proposed drainage.

NON-STRUCTURAL BMP'S

Non-structural erosion controls, including project schedule, surface roughening and other pollution prevention measures, will be detailed in the construction activities of the SWMP. Permanent, perennial, native seeding will be established onsite in locations specified by the SWMP and Landscape Architect. The seed mix will be provided in the SWMP reference.

Irrigation Ditch Impacts:

Leggett Ditch runs along the east portion of the site. The detention is anticipated to provide the historic release rate of the Boulder County Compost Facility developed site. No significant impacts are anticipated to the Leggett Ditch channel.

Wetland Impacts:

The Boulder County Compost facility has no delineated wetlands on site. No significant impacts are expected to occur from the developed portion of the site.

5 – CONCLUSIONS

COMPLIANCE WITH STANDARDS

The drainage facilities for the development of the Boulder County Compost Facility have been designed in accordance with the with the "Boulder County Storm Drainage Criteria Manual" (Revised November 2016) and the latest methods endorsed the by the Mile High Flood District.

The anticipated drainage from the proposed development is designed to maintain existing runoff conditions, enhance water quality, and prevent adverse conditions on the adjacent properties and surrounding public resources.

DRAINAGE CONCEPT

Overall, the proposed drainage concept maintains the existing drainage conditions on the site. The drainage patterns will be changed from sheet flow to direct runoff either via storm sewer pipes or swales, with adequate detention provided for the 100-year runoff event, with the majority of the flow now receiving enhanced water quality treatment before being released from the site.

Storm improvements include an extended detention basin (EDBs) with a water quality outlet and controlled release to the Leggett Ditch at MHFD design rates, eventually conveying flow to the Panama Reservoir No.1 per historic drainage patterns. Other water quality BMP's introduced to the site include enhanced landscaping and swales.

The referenced drainage map, Exhibit 2 depicts the drainage design points, developed runoff basins, water quality and drainage pond features, and configuration of the proposed storm drainage systems.

6 – REFERENCES

1. "Boulder County Storm Drainage Criteria Manual" November 2016.
2. "Urban Storm Drainage Criteria Manual," Mile High Flood District, updated February 2017.
3. Web Soil Survey, Natural Resources Conservation Service, United State Department of Agriculture, Online at http://websoilsurvey.nrcs.usda.gov, accessed August 10, 2018.
4. FEMA Flood Map Service Center, Online https://msc.fema.gov/portal, accessed October 7, 2020.

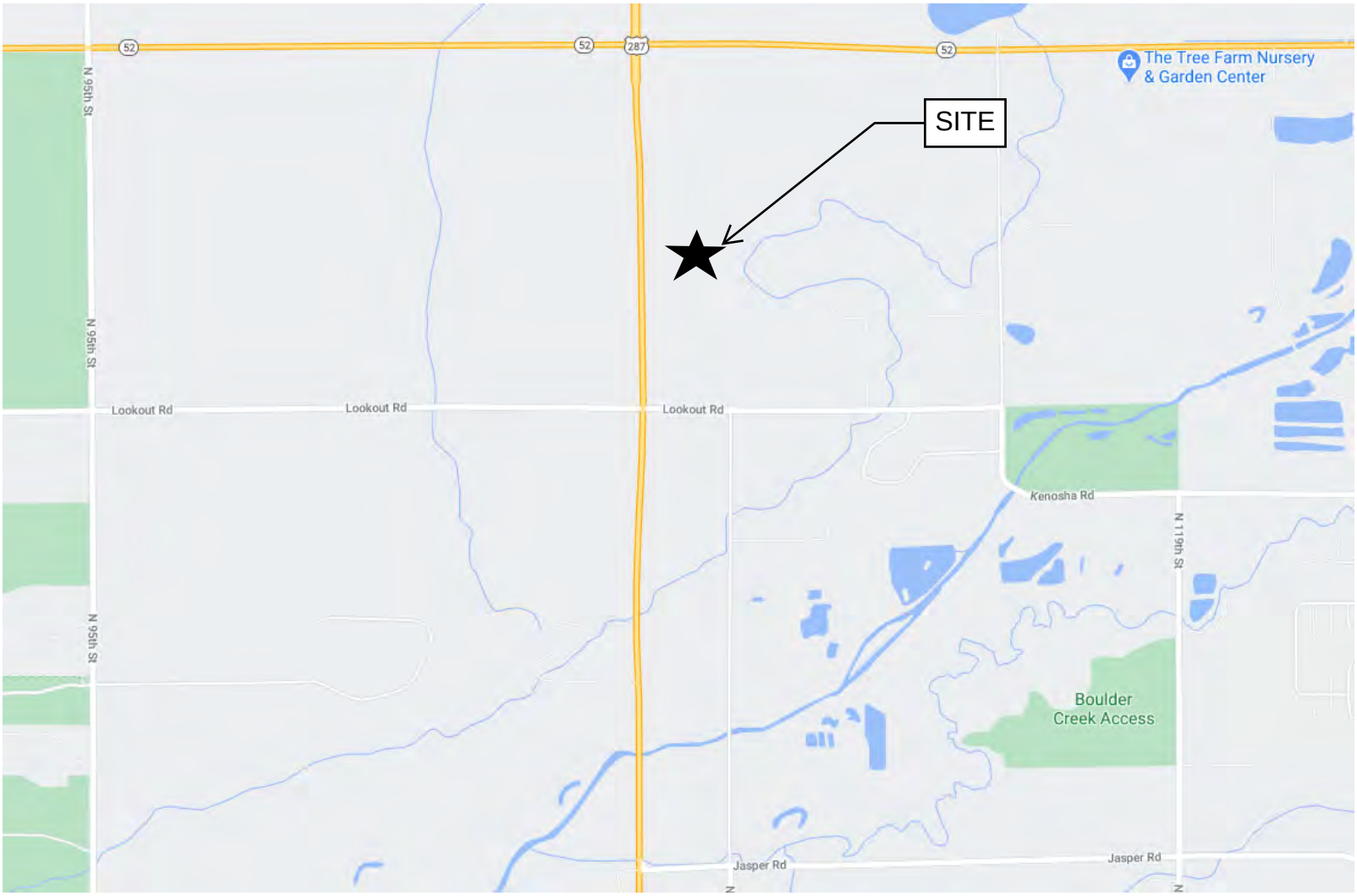
APPENDIX A – MAPPING AND INFORMATION

BOULDER COUNTY COMPOST FACILITY

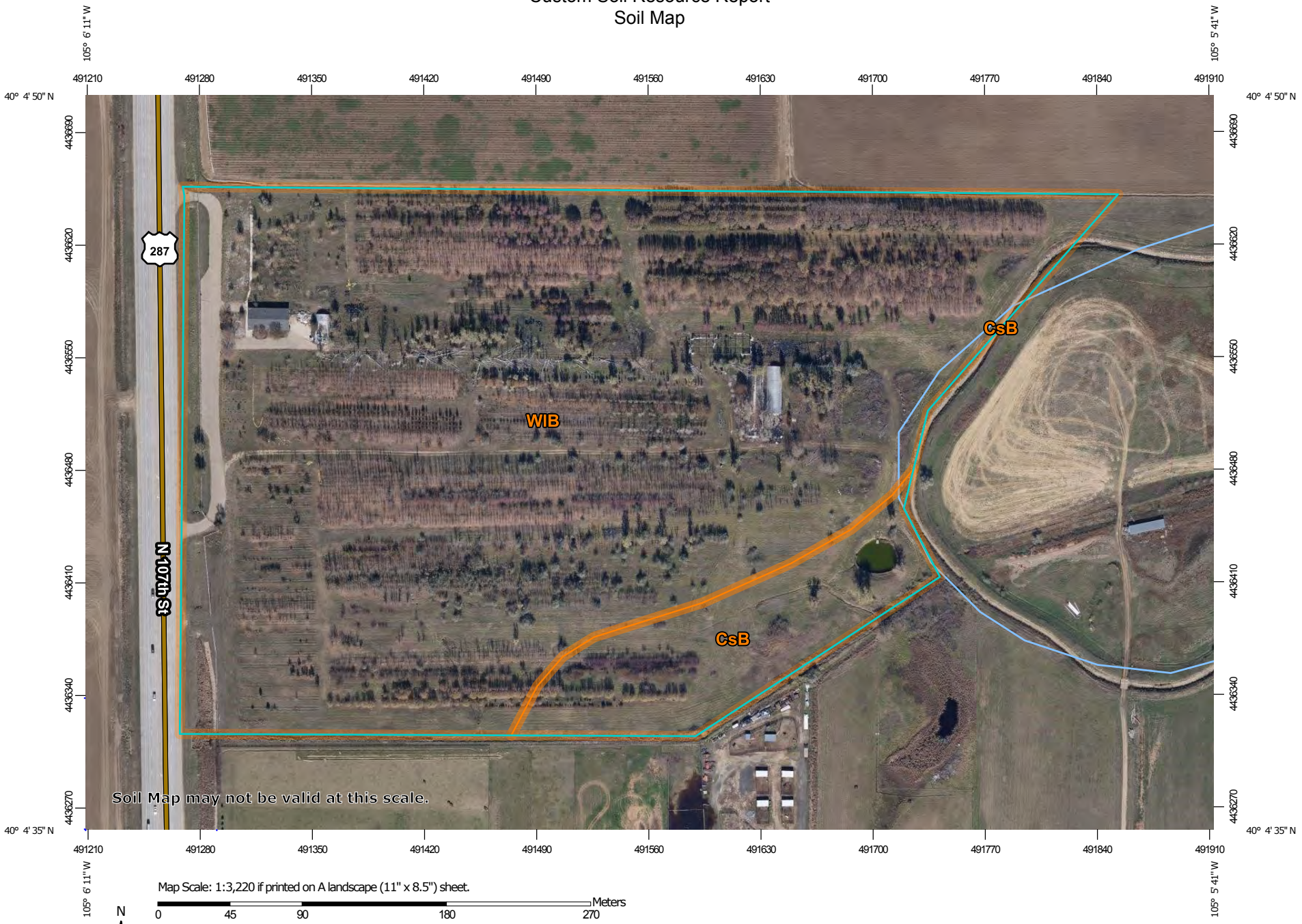
AT

5762 NORTH 107TH STREET,
UNINCORPORATED BOULDER COUNTY

VICINITY MAP – NOT TO SCALE



Custom Soil Resource Report
Soil Map



Map Scale: 1:3,220 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Boulder County Area, Colorado
Survey Area Data: Version 17, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 1, 2018—Oct 31, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Boulder County Area, Colorado

CsB—Colby silty clay loam, wet, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: jprh
Elevation: 4,900 to 5,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 140 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Colby and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colby

Setting

Landform: Valleys
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Uniform eolian deposits

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 40 inches: clay loam, silty clay loam, silt loam
H2 - 12 to 40 inches: stratified clay loam to silty clay
H2 - 12 to 40 inches:
H3 - 40 to 60 inches:

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 21.1 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Weld
Percent of map unit: 10 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 4 percent
Landform: Swales
Hydric soil rating: Yes

Gaynor
Percent of map unit: 1 percent
Hydric soil rating: No

WlB—Weld loam, 1 to 3 percent slopes

Map Unit Setting
National map unit symbol: 2x0hw
Elevation: 3,600 to 5,750 feet
Mean annual precipitation: 12 to 17 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 115 to 155 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Weld and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weld

Setting
Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous loess

Typical profile
Ap - 0 to 8 inches: loam
Bt1 - 8 to 12 inches: clay
Bt2 - 12 to 15 inches: clay loam
Btk - 15 to 28 inches: loam
Bk - 28 to 60 inches: silt loam
C - 60 to 80 inches: silt loam

Properties and qualities
Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 14 percent
Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Minor Components

Adena

Percent of map unit: 8 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Colby

Percent of map unit: 7 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Keith

Percent of map unit: 3 percent
Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

Baca

Percent of map unit: 2 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear, convex

Across-slope shape: Linear, convex
Ecological site: R067BY002CO - Loamy Plains
Hydric soil rating: No

National Flood Hazard Layer FIRMette

FEMA

105°6'21"W 40°4'51"N

105°5'43"W 40°4'23"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

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
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 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

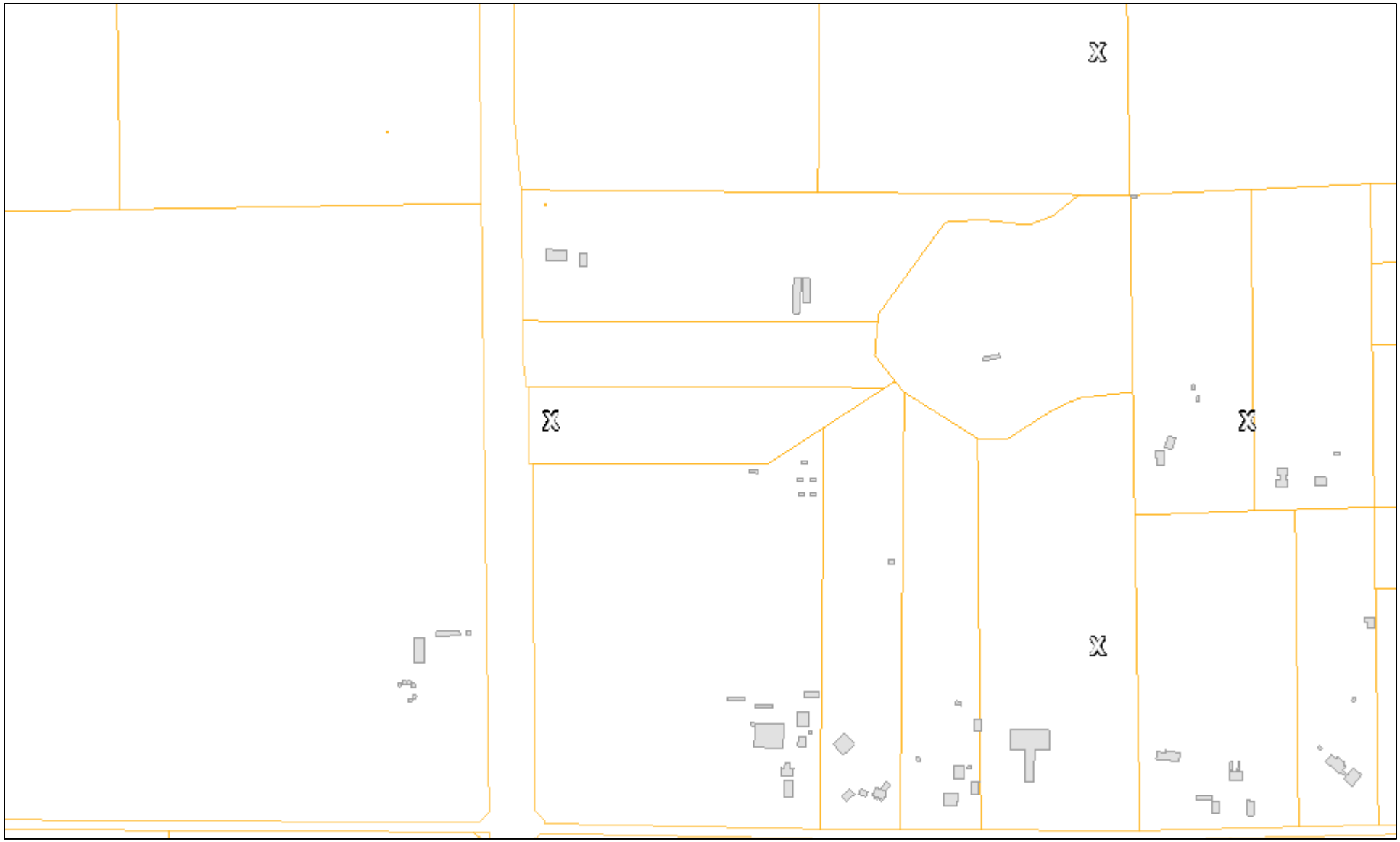
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 10/7/2020 at 8:11 PM 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.

ArcGIS Web Map



Boulder County Regulatory Flood Risk Zones

- Floodway (Boulder County)
- 100-Year Floodplain - Zones AE, A, AO, and AH (Boulder County)
- 500-Year Floodplain - Zone X500 (Boulder County)

Flood Risk Zones (FEMA)

FEMA Regulatory Flood Risk Zones

- Floodway (FEMA)
- 100-Year Floodplain - Zones AE, A, AO and AH (FEMA)
- 500-Year Floodplain - Zone X500 (FEMA)

Assessor Parcels

N
W E
S

0 0.04 0.08 0.16 mi

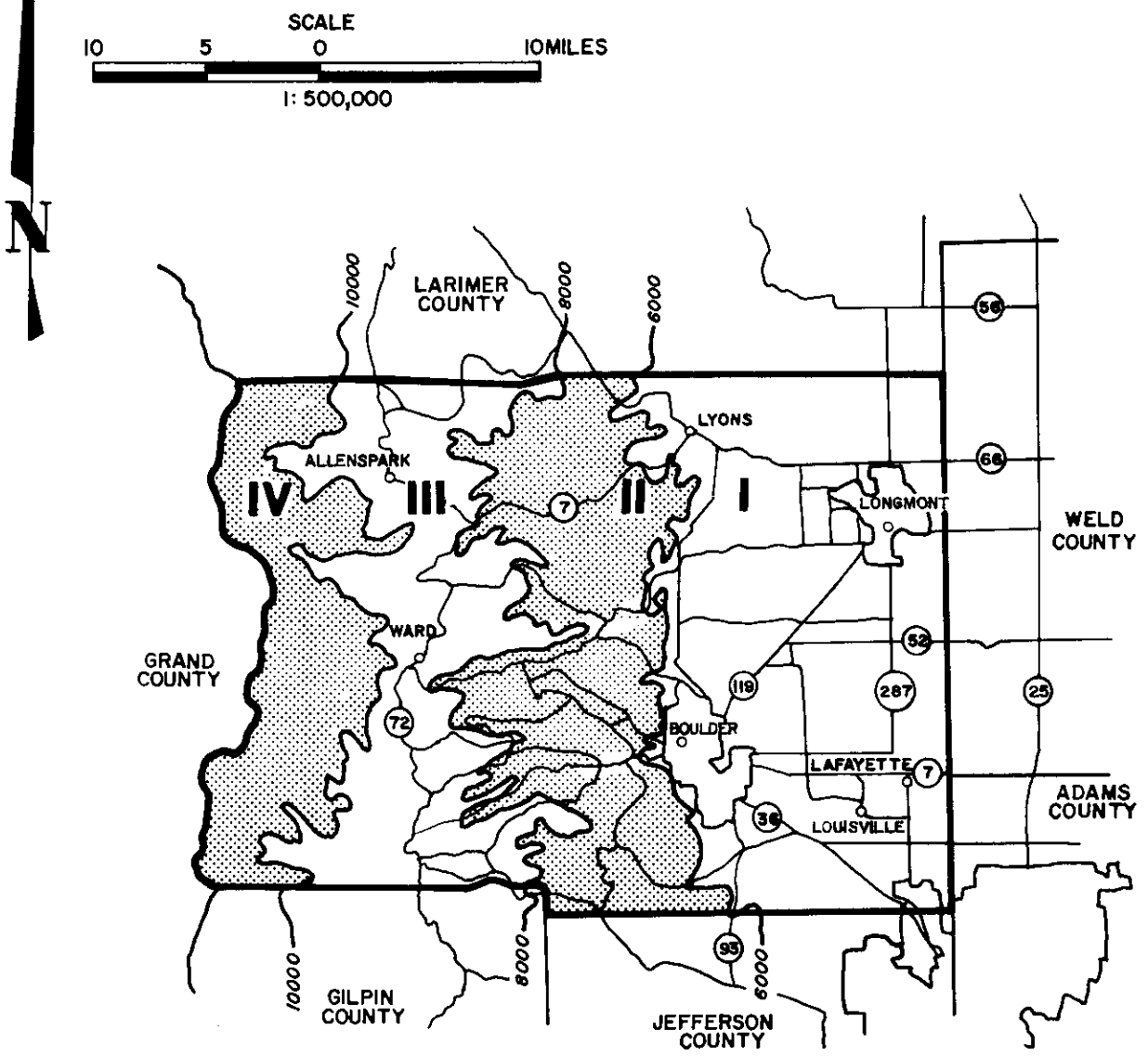
APPENDIX B – CALCULATIONS

TIME - INTENSITY - FREQUENCY TABULATION

ZONE	FREQ.	RAINFALL INTENSITY (IN/HR)/DURATION				
		5 MIN	10 MIN	15 MIN	30 MIN	60 MIN
I	2-YR	3.51	2.73	2.30	1.60	1.01
	5-YR	4.98	3.86	3.26	2.26	1.43
	10-YR	6.02	4.67	3.94	2.73	1.73
	50-YR	8.35	6.48	5.47	3.79	2.40
	100-YR	9.40	7.29	6.16	4.27	2.70
II	2-YR	3.24	2.51	2.12	1.47	0.93
	5-YR	4.52	3.51	2.96	2.05	1.30
	10-YR	5.43	4.21	3.56	2.46	1.56
	50-YR	7.55	5.86	4.95	3.43	2.17
	100-YR	8.49	6.59	5.56	3.86	2.44
III	2-YR	2.68	2.08	1.76	1.22	0.77
	5-YR	3.83	2.97	2.51	1.74	1.10
	10-YR	4.66	3.62	3.06	2.12	1.34
	50-YR	6.58	5.10	4.31	2.99	1.89
	100-YR	7.45	5.78	4.88	3.38	2.14

See Figures-502, -503, and -504 for plot of data.

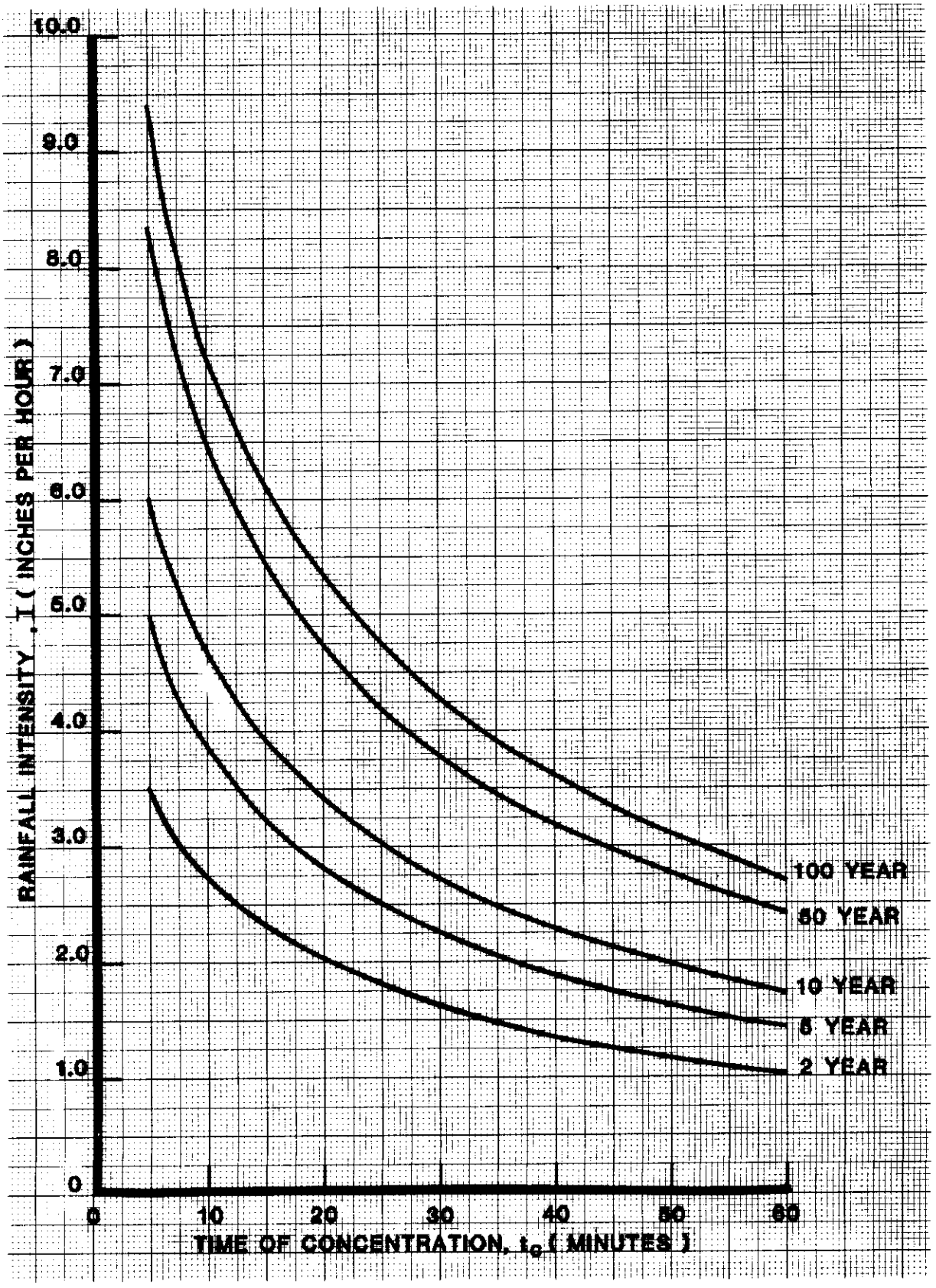
RAINFALL ZONES



WRC ENG.	REFERENCE: Base map from USGS map for State of Colorado, Rev 1980

FIGURE 502

TIME-INTENSITY-FREQUENCY CURVES ZONE I



WRC ENG.

REFERENCE: WRC TM-1 NOV. 1983

JVA Incorporated
1319 Spruce Street
Boulder, CO 80302
Ph: (303) 444 1951

JVA Office:
Boulder

Version 2019_XT: 4/16/2019

Project Information:

Job Name:	BOCO Compost Facility
Job Number:	3305c
Date:	October 12,2020
Designed by:	TRR
Municipality :	Boulder_County
Soil Type:	C/D

Runoff Calculations:

Minor Design Storm:	5	year
Major Design Storm:	100	year

Detention Calculations:

Minor Storm Detention:	10	year	plus	100	% WQCV
Major Storm Detention:	100	year	plus	50	% WQCV
Detention Volume by:	Modified FAA (UDFCD)		Enter WQCV :	14,984	cf
				(GB, PP, PLD, SFB, EDB,etc.)	

Allowable Release Rates (if applicable):

Max release rate 1 cfs / acre? Yes Site Area: 39.70 acres

Enter Offsite flows to bypass site (these will be added to the allowable release rates)

Q10 =	0.00	cfs (bypass flows)	**Q10allow =**	**11.91**	**cfs**
Q100 =	0.00	cfs (bypass flows)	**Q100allow =**	**39.70**	**cfs**

Rainfall Data Information:

Enter City, Town, or County: Boulder_County

Frequency of Design Event	One Hour Point Rainfall P1	
2 yr	1.01	in
5 yr	1.43	in
10 yr	1.73	in
100 yr	2.70	in

Do you need to Calc P1? No

Runoff Coefficient Calculations:

Use UDFCD Equations? No

Intensity Duration Values:

I-D-F BoulderCountyIDF

JVA Incorporated
1319 Spruce Street
Boulder, CO 80302
Ph: (303) 444 1951

Job Name: BOCO Compost Facility
Job Number: 3305c
Date: October 12,2020
By: TRR

	I%	C2	C5	C10	C100
Streets Paved	100%	0.87	0.88	0.90	0.93
Concrete Drives/Walks	96%	0.87	0.87	0.88	0.89
Roof	90%	0.80	0.85	0.90	0.90
Gravel	13%	0.15	0.25	0.35	0.65
Landscaping (B soil)	0%	0.00	0.01	0.05	0.20
Landscaping (C/D soil)	0%	0.05	0.10	0.20	0.40
Playground	13%	0.15	0.25	0.35	0.65
Artificial Turf	25%	0.28	0.38	0.43	0.62

BOCO Compost Facility

Historic Runoff Coefficient & Time of Concentration Calculations

Location: Boulder County
Minor Design Storm: 5
Major Design Storm: 100
Soil Type: C/D

Basin Design Data

	I (%) =	100%	96%	90%	13%	13%	25%	0%	0%			I (%)	Runoff Coeff's				Initial Overland Time (t_i)			Travel Time (t_t) t_t=Length/(Velocity x 60)						t_c Comp	tc Urbanized Check OFF		t_c Final
Basin Name	Design Point	$A_{paved\ streets}$ (sf)	$A_{drives/conc}$ (sf)	A_{roof} (sf)	A_{gravel} (sf)	A_{plygnd} (sf)	$A_{art.\ turf}$ (sf)	$A_{lscape\ (B\ soil)}$ (sf)	$A_{lscape\ (C/D\ soil)}$ (sf)	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100	Upper most Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	K	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Total Length (ft)	t_c=(L/180)+ 10 (min.)	Min t_c
H	1	25,414	3,696	18,913	17,968				1,664,128	1,730,120	39.72	2.8%	0.07	0.12	0.22	0.42	500	1.4%	35.8	1080	1.0%	Tillage/field	5	0.5	36.0	71.8	1580	N/A	71.8
										0	0.00											Paved areas & shallow paved swales	20				0	N/A	
										0	0.00											Paved areas & shallow paved swales	20				0	N/A	
										0	0.00											Paved areas & shallow paved swales	20				0	N/A	
										0	0.00											Paved areas & shallow paved swales	20				0	N/A	
TOTAL SITE		25,414	3,696	18,913	17,968	0	0	0	1,664,128	1,730,120	39.72	2.8%	0.07	0.12	0.22	0.42													

			Runoff Coeff's				Rainfall Intensities (in/hr)				Area		Flow Rates (cfs)			
Basin Name	Design Point	Time of Conc (tc)	C2	C5	C10	C100	2	5	10	100	A_{Total} (sf)	A_{Total} (ac)	Q2	Q5	Q10	Q100
H	1	71.8	0.07	0.12	0.22	0.42	1.01	1.43	1.73	2.70	1,730,120	39.72	2.93	6.98	15.18	44.71
0	0										0	0.00				
0	0										0	0.00				
0	0										0	0.00				
0	0										0	0.00				
										TOTAL SITE	1,730,120	39.72	2.93	6.98	15.18	44.71

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	I%	C2	C5	C10	C100
Streets Paved	100%	0.87	0.88	0.90	0.93
Concrete Drives/Walks	96%	0.87	0.87	0.88	0.89
Roof	90%	0.80	0.85	0.90	0.90
Gravel	13%	0.15	0.25	0.35	0.65
Landscaping (B soil)	0%	0.00	0.01	0.05	0.20
Landscaping (C/D soil)	0%	0.05	0.10	0.20	0.40
Playground	13%	0.15	0.25	0.35	0.65
Artificial Turf	25%	0.28	0.38	0.43	0.62

BOCO Compost Facility

Composite Runoff Coefficient Calculations

Location: Boulder_County
Minor Design Storm: 5
Major Design Storm: 100
Soil Type: C/D

Basin Design Data

	I (%) =	100%	96%	90%	13%	13%	25%	0%	0%			I (%)	Runoff Coeff's			
Basin Name	Design Point	A_{paved} streets (sf)	$A_{drives/conc}$ (sf)	A_{roof} (sf)	A_{gravel} (sf)	A_{plygnd} (sf)	$A_{art. turf}$ (sf)	$A_{lscape (B soil)}$ (sf)	$A_{lscape (C/D soil)}$ (sf)	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100
A	1	35,759	4,188	3,223	6,108				128,722	178,000	4.09	24.4%	0.25	0.29	0.37	0.54
B	2	39,657		3,000	42,887				96,162	181,706	4.17	26.4%	0.26	0.32	0.40	0.58
C	3				118,555				114,445	233,000	5.35	6.6%	0.10	0.18	0.28	0.53
D	4	7,381		17,500	53,972				71,715	150,568	3.46	20.0%	0.21	0.28	0.37	0.57
E	5	69,283	9,482		31,711				800,044	910,520	20.90	9.1%	0.12	0.17	0.27	0.45
										0	0.00					
OS1	6								10,319	10,319	0.24	0.0%	0.05	0.10	0.20	0.40
OS2	7								57,744	57,744	1.33	0.0%	0.05	0.10	0.20	0.40
TOTAL SITE		152,080	13,670	23,723	253,233	0	0	0	1,279,151	1,721,857	39.53	12.7%	0.15	0.21	0.30	0.49

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BOCO Compost Facility

Time of Concentration Calculations

Location: Boulder County
Minor Design Storm: 5
Major Design Storm: 100
Soil Type: C/D

Sub-Basin Data				Initial Overland Time (t_i)			Travel Time (t_t) t_t=Length/(Velocity x 60)						t_c Comp	tc Urbanized Check OFF		t_c Final
Basin Name	Design Point	A_{Total} (ac)	C5	Upper most Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	C_v	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Total Length (ft)	t_c=(L/180)+ 10 (min)	Min t_c
A	1	4.09	0.29	500	1.3%	30.3	131	1.3%	Tillage/field	5	0.6	3.8	34.1	631	N/A	34.1
B	2	4.17	0.32	500	1.9%	25.9	199	1.9%	Paved areas & shallow paved swales	20	2.8	1.2	27.1	699	N/A	27.1
C	3	5.35	0.18	500	1.5%	33.1	183	1.1%	Paved areas & shallow paved swales	20	2.1	1.5	34.5	683	N/A	34.5
D	4	3.46	0.28	500	1.1%	32.6	102	1.0%	Paved areas & shallow paved swales	20	2.0	0.9	33.4	602	N/A	33.4
E	5	20.90	0.17	500	2.0%	30.2	800	1.0%	Heavy Meadow	3	0.3	53.3	83.5	1300	N/A	83.5
OS1	6	0.24	0.10	100	1.0%	18.3	250	2.0%	Grassed waterway	15	2.1	2.0	20.3	350	N/A	20.3
OS2	7	1.33	0.10	303	1.0%	31.9	112	1.5%	Heavy Meadow	3	0.3	6.1	38.0	415	N/A	38.0

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BOCO Compost Facility

Developed Storm Runoff Calculations

Design Storm : **100 Year**

Point Hour Rainfall (P_1) : **2.70**

	Direct Runoff							Total Runoff				Inlets				Pipe					Pipe/Swale Travel Time				
Basin Name	Design Point	Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover	Q bypass	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)	tt (min)	Total Time (min)	Notes
A	1	4.09	0.54	34.10	2.19	4.06	8.89	34.10	2.19	4.06	8.89	15" FES	8.88			15 in	RCP	1.9%	8.9	9.6	100	4.9	0.34	34.44	
B	2	4.17	0.58	27.10	2.43	4.64	11.27	27.10	2.43	4.64	11.27	Valley Inlet	11.27			18 in	RCP	1.9%	11.3	15.6	264	5.5	0.80	27.90	
C	3	5.35	0.53	34.50	2.82	4.04	11.39	34.50	2.82	4.04	11.39	18" FES	11.37			18 in	RCP	1.9%	11.4	15.6	80	5.5	0.24	34.74	
D	4	3.46	0.57	33.40	1.98	4.09	8.11	34.74	4.80	4.02	19.33	24" FES	19.39			24 in	RCP	1.9%	19.3	33.5	46	6.7	0.12	34.86	D+C
E	5	20.90	0.45	83.50	9.49	2.70	25.63	83.50	18.92	2.70	51.07	POND OUTLET	51.07												A+B+C+D+E
OS1	6	0.24	0.40	20.30	0.09	5.49	0.52	20.30	0.09	5.49	0.52	N/A													
OS2	7	1.33	0.40	38.00	0.53	3.86	2.04	38.00	0.53	3.86	2.04	N/A													

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BOCO Compost Facility

Developed Storm Runoff Calculations

Design Storm : **5 Year**

Point Hour Rainfall (P_1) : **1.43**

	Direct Runoff							Total Runoff				Inlets				Pipe					Pipe/Swale Travel Time				
Basin Name	Design Point	Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover	Q bypass	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)	tt (min)	Total Time (min)	Notes
A	1	4.09	0.29	34.10	1.20	2.15	2.58	34.10	1.20	2.15	2.58	15" FES	2.58			15 in	RCP	1.9%	2.6	9.6	100	4.9	0.34	34.44	
B	2	4.17	0.32	27.10	1.33	2.45	3.25	27.10	1.33	2.45	3.25	Valley Inlet	3.25			18 in	RCP	1.9%	3.3	15.6	264	5.5	0.80	27.90	
C	3	5.35	0.18	34.50	0.94	2.14	2.02	34.50	0.94	2.14	2.02	18" FES	5.01			18 in	RCP	1.9%	2.0	15.6	80	5.5	0.24	34.74	
D	4	3.46	0.28	33.40	0.96	2.17	2.09	34.74	1.91	2.13	4.06	24" FES	2.13			24 in	RCP	1.9%	4.1	33.5	46	6.7	0.12	34.86	
E	5	20.90	0.17	83.50	3.61	1.43	5.16	83.50	8.04	1.43	11.50	POND OUTLET	11.50												
OS1	6	0.24	0.10	20.30	0.02	2.91	0.07	20.30	0.02	2.91	0.07	N/A													
OS2	7	1.33	0.10	38.00	0.13	2.04	0.27	38.00	0.13	2.04	0.27	N/A													

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BOCO Compost Facility

Developed Storm Runoff Calculations

Design Storm : **10 Year**

Point Hour Rainfall (P_1) : **1.73**

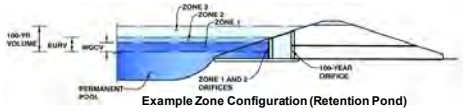
	Direct Runoff							Total Runoff				Inlets				Pipe					Pipe/Swale Travel Time				
Basin Name	Design Point	Area (ac)	Runoff Coeff	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Inlet Type	Q intercepted	Q carryover	Q bypass	Pipe Size (in) or equivalent	Pipe Material	Slope (%)	Pipe Flow (cfs)	Max Pipe Capacity (cfs)	Length (ft)	Velocity (fps)	tt (min)	Total Time (min)	Notes
A	1	4.09	0.37	34.10	1.53	2.60	3.97	34.10	1.53	2.60	3.97	15" FES	2.58			15 in	RCP	1.9%	4.0	9.6	100	4.9	0.34	34.44	
B	2	4.17	0.40	27.10	1.67	2.96	4.94	27.10	1.67	2.96	4.94	Valley Inlet	3.25			18 in	RCP	1.9%	4.9	15.6	264	5.5	0.80	27.90	
C	3	5.35	0.28	34.50	1.48	2.58	3.82	34.50	1.48	2.58	3.82	18" FES	5.01			18 in	RCP	1.9%	3.8	15.6	80	5.5	0.24	34.74	
D	4	3.46	0.37	33.40	1.28	2.62	3.34	34.74	2.76	2.57	7.09	24" FES	2.13			24 in	RCP	1.9%	7.1	33.5	46	6.7	0.12	34.86	
E	5	20.90	0.27	83.50	5.55	1.73	9.60	83.50	11.50	1.73	19.90	POND OUTLET	11.50												
OS1	6	0.24	0.20	20.30	0.05	3.51	0.17	20.30	0.05	3.51	0.17	N/A													
OS2	7	1.33	0.20	38.00	0.27	2.47	0.65	38.00	0.27	2.47	0.65	N/A													

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.03 (May 2020)

Project: **Boulder County Compost Facility**

Basin ID: **Boulder County Compost Facility Pond**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	39.72	acres
Watershed Length =	1,500	ft
Watershed Length to Centroid =	500	ft
Watershed Slope =	0.013	ft/ft
Watershed Imperviousness =	12.80%	percent
Percentage Hydrologic Soil Group A =	1.0%	percent
Percentage Hydrologic Soil Group B =	1.0%	percent
Percentage Hydrologic Soil Groups C/D =	98.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Erie	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.272 acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.432 acre-feet		acre-feet
2-yr Runoff Volume (P1 = 0.81 in.) =	0.223 acre-feet		inches
5-yr Runoff Volume (P1 = 1.11 in.) =	0.608 acre-feet		inches
10-yr Runoff Volume (P1 = 1.39 in.) =	1.305 acre-feet		inches
25-yr Runoff Volume (P1 = 1.84 in.) =	2.966 acre-feet		inches
50-yr Runoff Volume (P1 = 2.24 in.) =	4.267 acre-feet		inches
100-yr Runoff Volume (P1 = 2.68 in.) =	5.962 acre-feet		inches
500-yr Runoff Volume (P1 = 3.89 in.) =	10.168 acre-feet		inches
Approximate 2-yr Detention Volume =	0.240 acre-feet		
Approximate 5-yr Detention Volume =	0.560 acre-feet		
Approximate 10-yr Detention Volume =	0.772 acre-feet		
Approximate 25-yr Detention Volume =	1.066 acre-feet		
Approximate 50-yr Detention Volume =	1.204 acre-feet		
Approximate 100-yr Detention Volume =	1.745 acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.272	acre-feet
Zone 2 Volume (10-year - Zone 1) =	0.500	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.973	acre-feet
Total Detention Basin Volume =	1.745	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

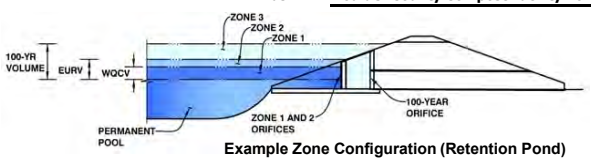
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	725	0.017		
5057.7	--	0.10	--	--	--	1,915	0.044	132	0.003
5057.8	--	0.20	--	--	--	4,074	0.094	431	0.010
5057.9	--	0.30	--	--	--	6,966	0.160	983	0.023
5058	--	0.40	--	--	--	10,242	0.235	1,844	0.042
5058.1	--	0.50	--	--	--	14,909	0.342	3,101	0.071
5058.2	--	0.60	--	--	--	19,533	0.448	4,823	0.111
5058.3	--	0.70	--	--	--	24,754	0.568	7,037	0.162
5058.4	--	0.80	--	--	--	30,194	0.693	9,785	0.225
5058.5	--	0.90	--	--	--	34,713	0.797	13,030	0.299
5058.6	--	1.00	--	--	--	38,245	0.878	16,678	0.383
5058.7	--	1.10	--	--	--	40,093	0.920	20,595	0.473
5058.8	--	1.20	--	--	--	42,889	0.985	24,744	0.568
5058.9	--	1.30	--	--	--	44,450	1.020	29,111	0.668
5059	--	1.40	--	--	--	45,728	1.050	33,620	0.772
5059.1	--	1.50	--	--	--	46,870	1.076	38,250	0.878
5059.2	--	1.60	--	--	--	49,912	1.146	43,089	0.989
5059.3	--	1.70	--	--	--	50,746	1.165	48,122	1.105
5059.4	--	1.80	--	--	--	55,614	1.277	53,440	1.227
5059.5	--	1.90	--	--	--	58,176	1.336	59,129	1.357
5059.6	--	2.00	--	--	--	61,291	1.407	65,103	1.495
5059.7	--	2.10	--	--	--	67,781	1.556	71,556	1.643
5059.8	--	2.20	--	--	--	70,526	1.619	78,471	1.801
5059.9	--	2.30	--	--	--	72,169	1.657	85,606	1.965
5060	--	2.40	--	--	--	72,606	1.667	92,845	2.131
5060.1	--	2.50	--	--	--	73,552	1.689	100,153	2.299
5060.2	--	2.60	--	--	--	73,983	1.698	107,530	2.469
5060.3	--	2.70	--	--	--	95,517	2.193	116,004	2.663
5060.4	--	2.80	--	--	--	132,663	3.046	127,413	2.925
5060.5	--	2.90	--	--	--	137,444	3.155	140,918	3.235

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.03 (May 2020)

Project: **Boulder County Compost Facility**

Basin ID: **Boulder County Compost Facility Pond**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.87	0.272	Orifice Plate
Zone 2 (10-year)	1.41	0.500	Circular Orifice
Zone 3 (100-year)	2.17	0.973	Weir (No Pipe)
Total (all zones)		1.745	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	1.326E-02	ft^2
Depth at top of Zone using Orifice Plate =	0.87	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	3.50	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	1.91	sq. inches (diameter = 1-9/16 inches)	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.29	0.58					
Orifice Area (sq. inches)	1.91	1.91	1.91					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Circular	Not Selected			Zone 2 Circular	Not Selected	
Invert of Vertical Orifice =	0.87	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	0.09	N/A	ft^2
Depth at top of Zone using Vertical Orifice =	1.41	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	0.17	N/A	feet
Vertical Orifice Diameter =	4.00	N/A	inches				

Calculated Parameters for Vertical Orifice

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe))

	Zone 3 Weir	Not Selected			Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.25	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	N/A	N/A	feet
Overflow Weir Bottom Length =	25.00	N/A	feet	Overflow Weir Slope Length =	N/A	N/A	feet
Overflow Weir Side Slopes =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	N/A	N/A	
Horiz. Length of Weir Sides =	N/A	N/A	feet	Overflow Grate Open Area w/o Debris =	N/A	N/A	ft^2
Overflow Grate Open Area % =	N/A	N/A	%, grate open area/total area	Overflow Grate Open Area w/ Debris =	N/A	N/A	ft^2
Debris Clogging % =	N/A	N/A	%				

Calculated Parameters for Overflow Weir

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected			Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =	N/A	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	N/A	N/A	ft^2
Circular Orifice Diameter =	N/A	N/A	inches	Outlet Orifice Centroid =	N/A	N/A	feet
				Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	2.80	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.96	feet
Spillway Crest Length =	25.00	feet	Stage at Top of Freeboard =	3.76	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	3.16	acres
Freeboard above Max Water Surface =	0.00	feet	Basin Volume at Top of Freeboard =	3.24	acre-ft
Spillway position relative to Overflow Weir =	Offset				

Calculated Parameters for Spillway

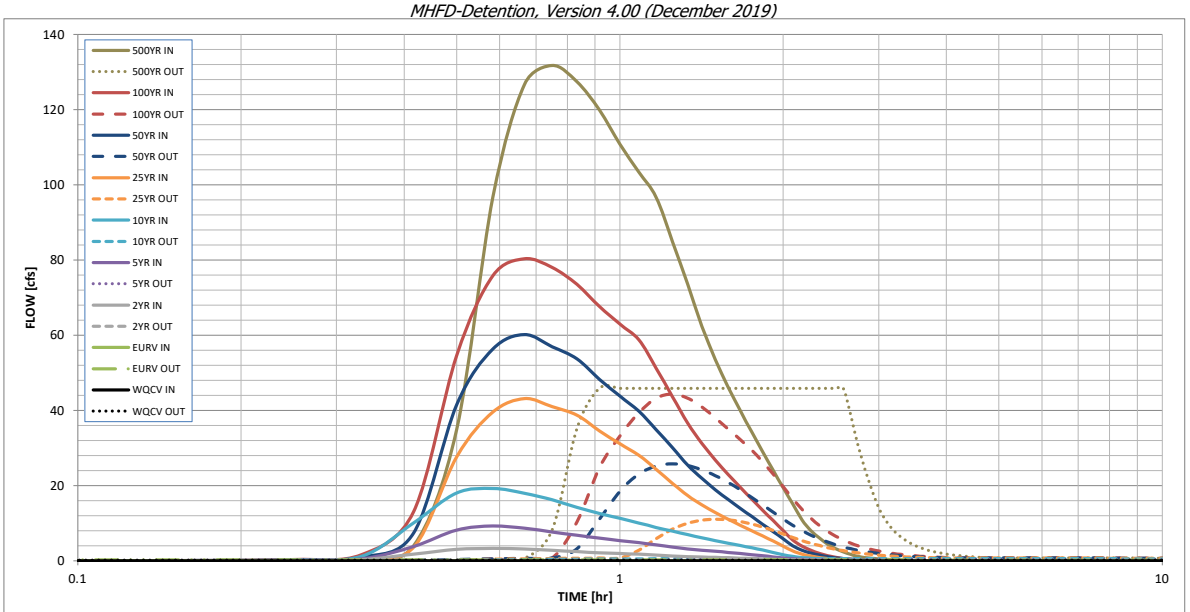
Routed Hydrograph Results

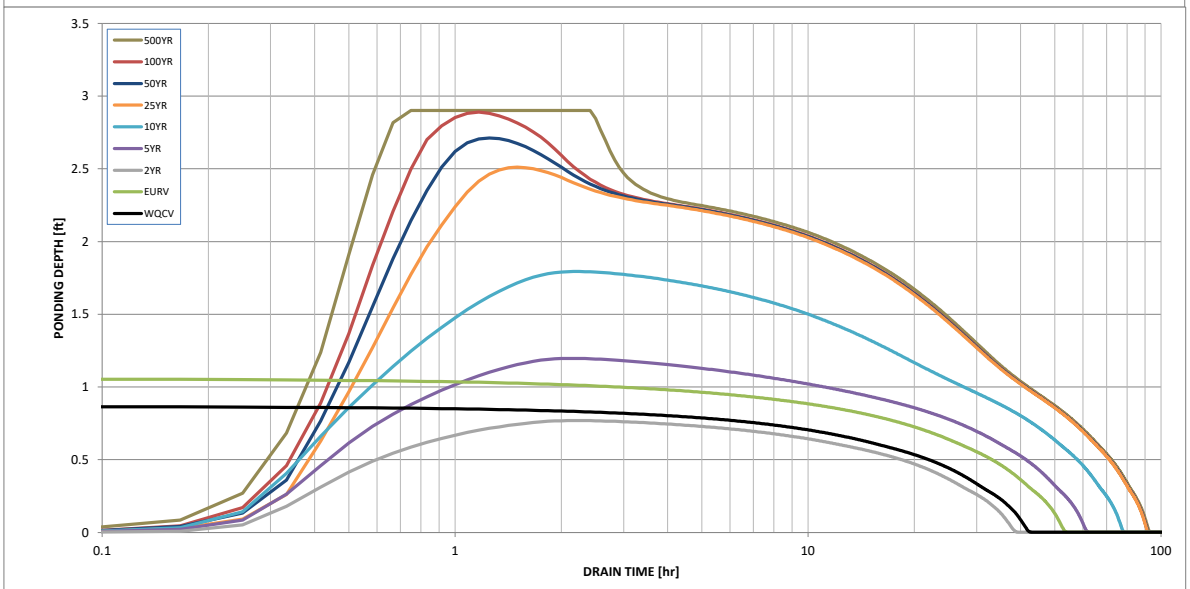
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

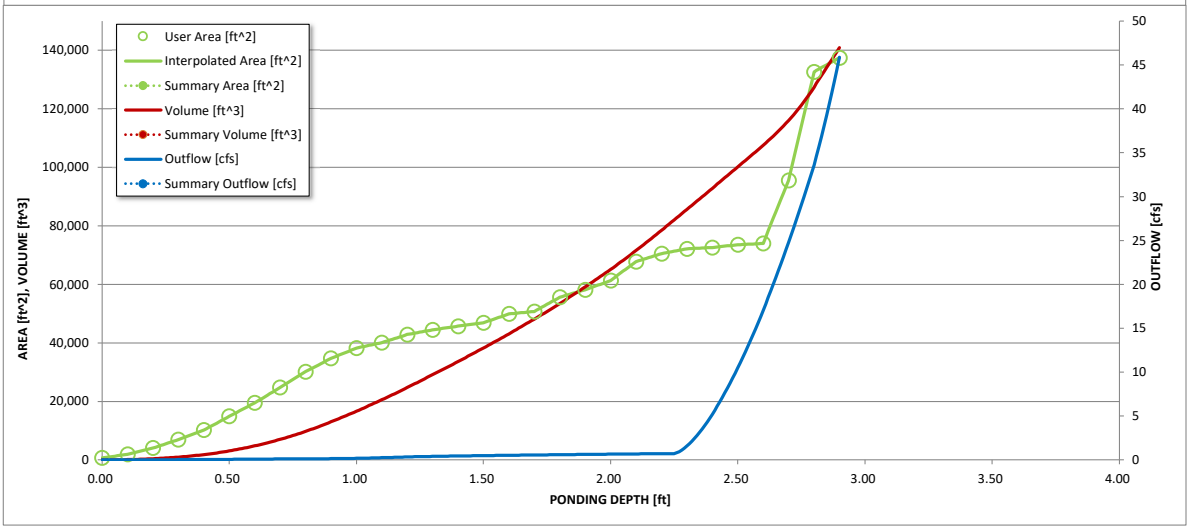
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	0.81	1.11	1.39	1.84	2.24	2.68	3.89
CUHP Runoff Volume (acre-ft) =	0.272	0.432	0.223	0.608	1.305	2.966	4.267	5.962	10.168
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.223	0.608	1.305	2.966	4.267	5.962	10.168
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.5	5.1	15.0	38.7	55.5	75.4	126.2
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.13	0.38	0.97	1.40	1.90	3.18
Peak Inflow Q (cfs) =	N/A	N/A	3.3	9.2	19.2	43.1	60.1	80.3	131.8
Peak Outflow Q (cfs) =	0.1	0.2	0.1	0.3	0.6	11.0	25.8	44.3	45.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.1	0.0	0.3	0.5	0.6	0.4
Structure Controlling Flow =	Plate	Vertical Orifice 1	Plate	Vertical Orifice 1	Vertical Orifice 1	Overflow Weir 1	Overflow Weir 1	Spillway	N/A
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	37	46	34	53	64	69	64	58	48
Time to Drain 99% of Inflow Volume (hours) =	**40**	50	37	58	71	79	77	74	68
Maximum Ponding Depth (ft) =	0.87	1.06	0.77	1.20	1.79	2.51	2.71	2.89	2.90
Area at Maximum Ponding Depth (acres) =	0.77	0.90	0.64	0.98	1.27	1.69	2.28	3.13	3.16
Maximum Volume Stored (acre-ft) =	0.276	0.436	0.198	0.558	1.214	2.299	2.685	3.172	3.235

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.12
	0:15:00	0.00	0.00	0.03	0.12	0.19	0.17	0.25	0.27	0.49
	0:20:00	0.00	0.00	0.30	0.48	1.17	0.48	0.91	1.58	4.08
	0:25:00	0.00	0.00	1.74	3.81	10.08	3.62	7.47	13.19	34.98
	0:30:00	0.00	0.00	3.03	8.18	18.06	27.66	41.53	54.64	96.78
	0:35:00	0.00	0.00	3.26	9.21	19.21	39.53	56.30	75.86	126.71
	0:40:00	0.00	0.00	3.13	8.64	17.94	43.12	60.14	80.32	131.76
	0:45:00	0.00	0.00	2.75	7.64	16.19	40.99	56.93	78.00	127.39
	0:50:00	0.00	0.00	2.41	6.77	14.18	38.73	53.71	73.48	119.89
	0:55:00	0.00	0.00	2.13	5.99	12.56	34.55	48.25	67.61	110.81
	1:00:00	0.00	0.00	1.92	5.37	11.26	31.11	43.79	62.93	103.40
	1:05:00	0.00	0.00	1.71	4.78	10.05	28.07	39.80	58.80	96.71
	1:10:00	0.00	0.00	1.47	4.22	8.86	24.31	34.89	51.22	84.94
	1:15:00	0.00	0.00	1.25	3.63	7.85	20.61	30.07	43.68	73.53
	1:20:00	0.00	0.00	1.08	3.14	6.93	17.30	25.41	36.60	62.34
	1:25:00	0.00	0.00	0.97	2.79	6.10	14.87	21.90	31.19	53.54
	1:30:00	0.00	0.00	0.87	2.50	5.34	12.82	18.88	26.76	46.22
	1:35:00	0.00	0.00	0.78	2.22	4.66	11.05	16.29	22.98	39.95
	1:40:00	0.00	0.00	0.69	1.91	4.03	9.45	13.94	19.56	34.26
	1:45:00	0.00	0.00	0.60	1.60	3.42	7.98	11.78	16.40	29.01
	1:50:00	0.00	0.00	0.52	1.31	2.83	6.57	9.71	13.44	24.07
	1:55:00	0.00	0.00	0.42	1.03	2.21	5.22	7.75	10.67	19.45
	2:00:00	0.00	0.00	0.32	0.76	1.59	3.91	5.86	8.05	15.10
	2:05:00	0.00	0.00	0.23	0.53	1.13	2.58	3.96	5.52	10.86
	2:10:00	0.00	0.00	0.18	0.39	0.86	1.74	2.79	3.88	8.01
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	2:20:00	0.00	0.00	0.11	0.24	0.53	0.86	1.47	1.97	4.43
	2:25:00	0.00	0.00	0.09	0.19	0.42	0.60	1.06	1.37	3.24
	2:30:00	0.00	0.00	0.07	0.15	0.33	0.43	0.77	0.92	2.34
	2:35:00	0.00	0.00	0.06	0.11	0.25	0.30	0.55	0.59	1.64
	2:40:00	0.00	0.00	0.04	0.08	0.18	0.21	0.38	0.38	1.14
	2:45:00	0.00	0.00	0.04	0.06	0.13	0.15	0.27	0.27	0.85
	2:50:00	0.00	0.00	0.03	0.05	0.10	0.12	0.20	0.20	0.64
	2:55:00	0.00	0.00	0.02	0.04	0.07	0.09	0.15	0.16	0.52
	3:00:00	0.00	0.00	0.02	0.03	0.06	0.07	0.12	0.12	0.40
	3:05:00	0.00	0.00	0.01	0.02	0.04	0.05	0.09	0.09	0.30
	3:10:00	0.00	0.00	0.01	0.01	0.03	0.04	0.06	0.07	0.21
	3:15:00	0.00	0.00	0.01	0.01	0.02	0.02	0.04	0.04	0.14
	3:20:00	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.03	0.09
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.04
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
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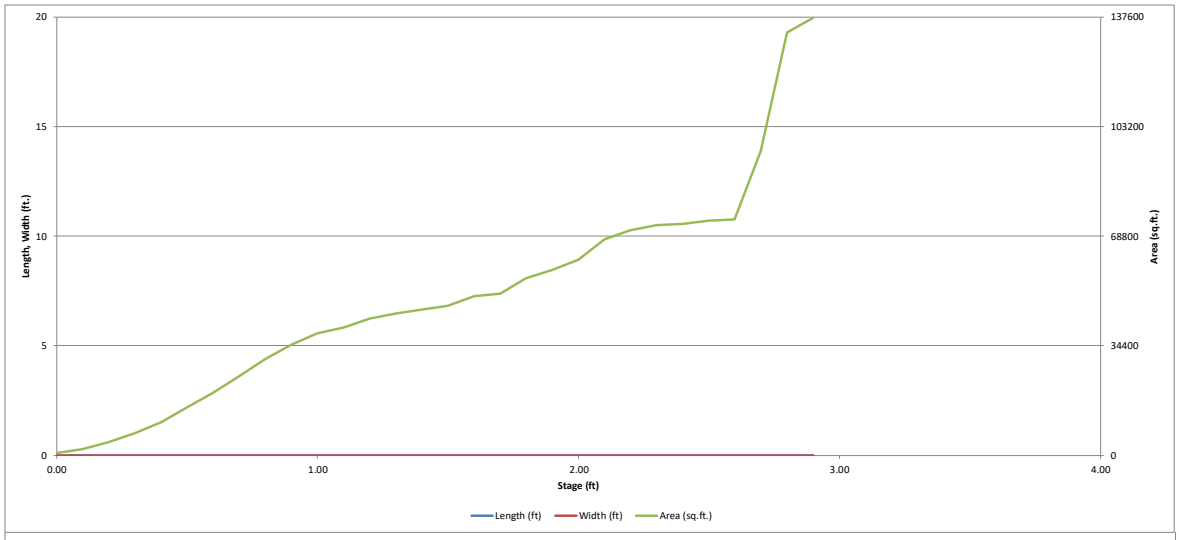
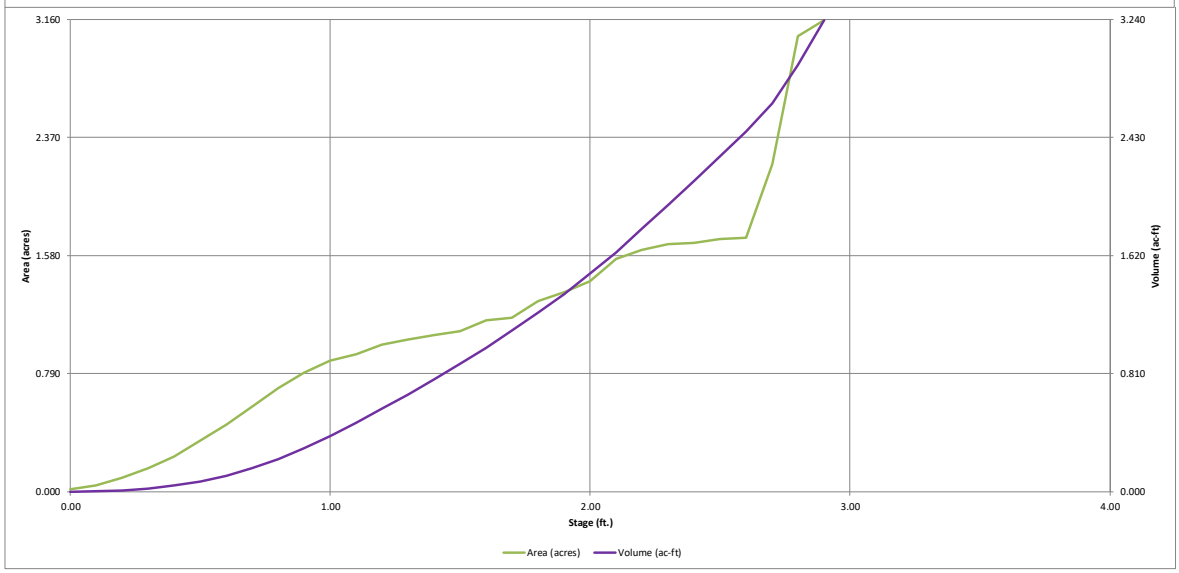
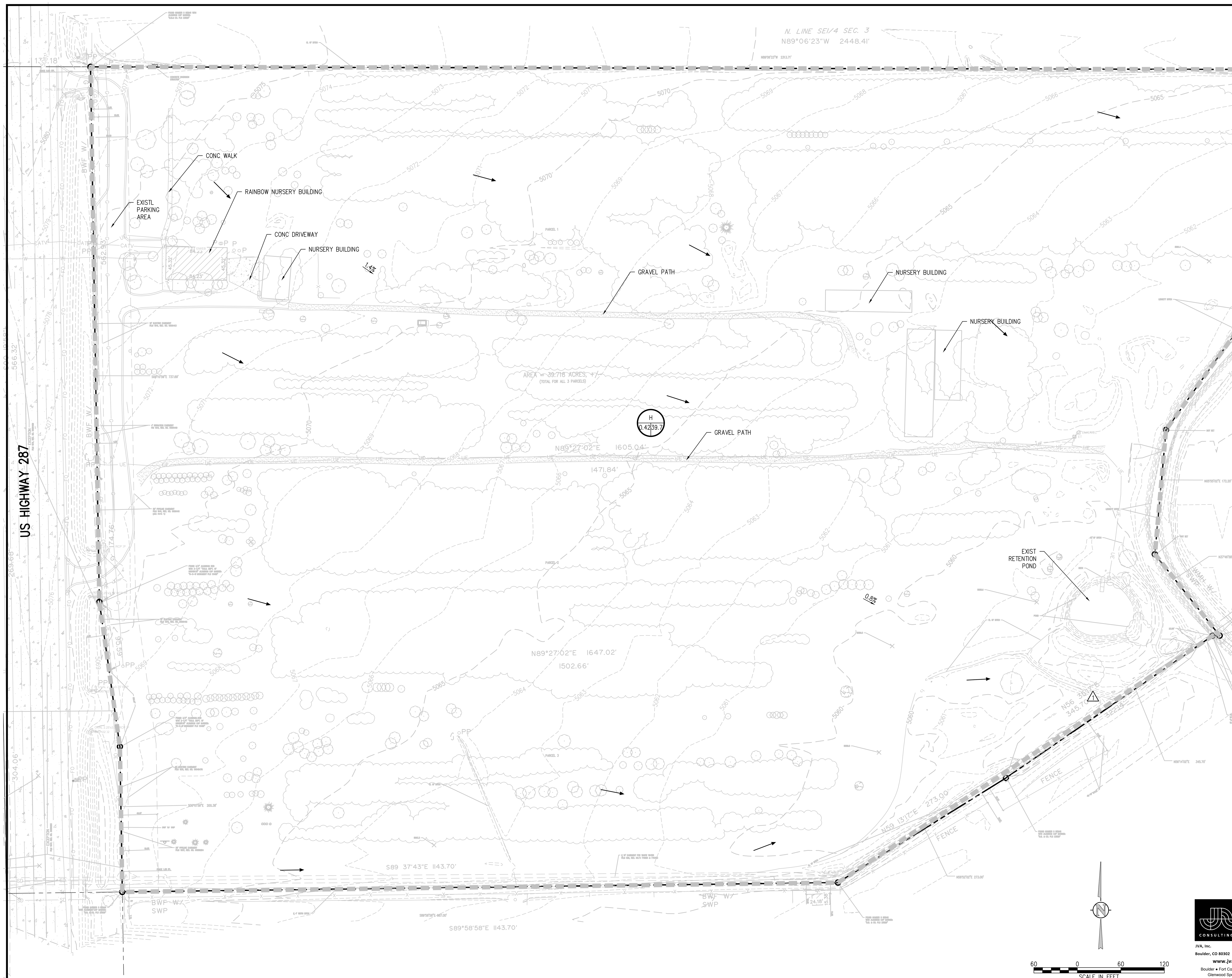
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.03 (May 2020)







DRAINAGE MAP LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- HISTORIC DRAINAGE BASIN BOUNDARY (MAJOR BASIN)
- HISTORIC DRAINAGE BASIN BOUNDARY (SUB BASIN)
- DIRECTION OF FLOW (DEVELOPED)
- BASIN DESIGN POINT
- DRAINAGE BASIN IDENTIFICATION BUBBLE
  - H = HISTORIC BASIN DESIGNATION
  - .50 = 100-YR RUNOFF COEFFICIENT
  - 1.0 = AREA ACRES

No.	Description	Date
1	SPECIAL USE REVIEW	10/12/20

PEH ARCHITECTS
1720 14th Street Suite 100
Boulder, CO 80302
303-442-0408

SPECIAL USE REVIEW

Boulder County Compost Facility

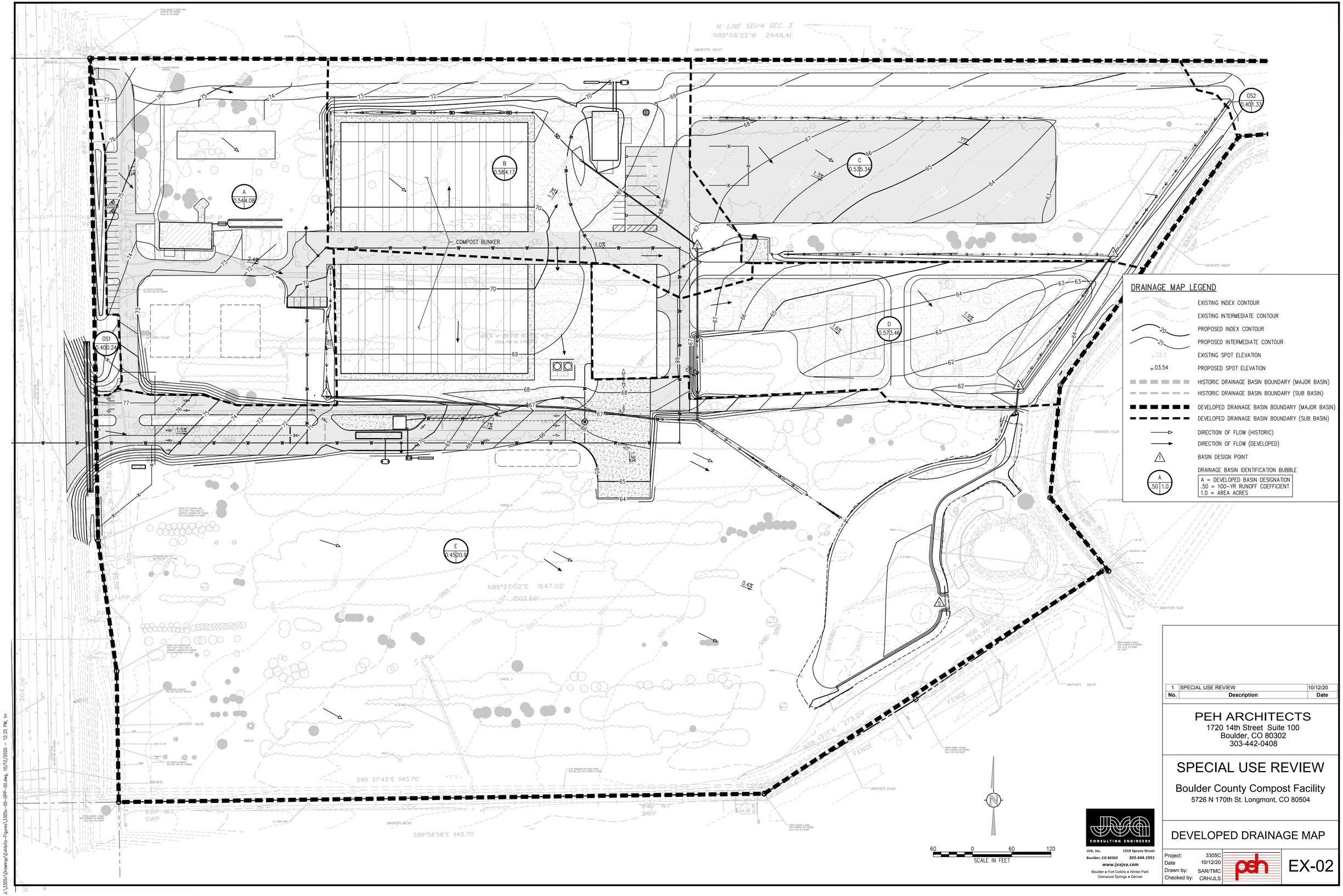
5726 N 170th St. Longmont, CO 80504

JVA CONSULTING ENGINEERS
JVA, Inc. 1319 Spruce Street
Boulder, CO 80302 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

HISTORIC DRAINAGE MAP

Project: 3305C
Date: 10/12/20
Drawn by: SAR/TMC
Checked by: CRH/JLS

EX-01



No.	Description	Date
1	SPECIAL USE REVIEW	10/12/20

PEH ARCHITECTS
1720 14th Street Suite 100
Boulder, CO 80302
303-442-0408

SPECIAL USE REVIEW

Boulder County Compost Facility
5726 N 170th St. Longmont, CO 80504

DEVELOPED DRAINAGE MAP

JVA, Inc. 1319 Spruce Street
Boulder, CO 80302 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

Project:	3305C
Date	10/12/20
Drawn by:	SAR/TMC
Checked by:	CRH/JLS

EX-02