

Coldstream Park Greenway Plan



Appendix J-1
Coldstream Park Stream Corridor
Restoration and Preservation
Supplemental Environmental Project

December 21, 2012

Coldstream Park Greenway Plan



Appendix J-1 Coldstream Park Stream Corridor Restoration and Preservation Supplemental Environmental Project

December 21, 2012

This report is presented to the Environmental Protection Agency (EPA) as the ***Plan Submittal for Appendix J-1, Coldstream Park Stream Corridor Restoration and Preservation SEP*** following the requirements of Appendix J-1 of the Consent Decree. This project was undertaken in connection with the settlement of an enforcement action under the Clean Water Act, United States et al. v. Lexington-Fayette Urban County Government, brought on behalf of the U.S. Environmental Protection Agency.

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
Consent Decree Appendix J-1 Supplemental Environmental Project
Coldstream Park Stream Corridor Restoration and Preservation SEP
COLDSTREAM PARK GREENWAY PLAN

TABLE OF CONTENTS

EXECUTIVE SUMMARY

APPENDIX A: Design Plans - EPA Submittal Set (December 2012)

APPENDIX B: Specifications (*Draft*) (October 2012)

APPENDIX C: Project Cost Estimates (October 2012)

APPENDIX D: Conservation Easement (*Draft*)

APPENDIX E: Preliminary Design:

- Risk Mitigation Plan (03/30/12)
- Technical Memorandum (06/15/12)

APPENDIX F: Stream Assessments:

- Stream Assessment Survey Results (07/13/12)
- Stream Assessment and Monitoring Plan (03/30/12)

APPENDIX G: Geotechnical Reports:

- Streambed Particle Size Distribution
- Test Pit Results (05/02/12)
- Rock Soundings Results (04/11/12)

APPENDIX H: Preliminary Hydrology/Hydraulics Analyses Results (11/12/12)

APPENDIX I: Resource Survey Documentation:

- Kentucky Heritage Council Response and Survey Form (09/24/12)
- Cultural Resource Survey of the Proposed Cane Run Stream Restoration Project in Coldstream Park in Fayette County, Kentucky (08/24/12)
- Endangered Species Act Section 7 Biological Assessment Documentation

APPENDIX J: CD/DVD of all files in digital .pdf format

COLDSTREAM PARK GREENWAY PLAN EXECUTIVE SUMMARY

Project Purpose and Background

The overall purpose of this project is to develop and implement a Coldstream Park Greenway Plan meeting the requirements of the Consent Decree Supplemental Environmental Project (SEP) as defined in Appendix J-1, Coldstream Park Stream Corridor Restoration and Preservation SEP. This plan is to include restoration of a section of Cane Run, which has been degraded due to straightening, stream bank erosion, and downcutting of the stream channel resulting in disconnection from the floodplain. The stream banks of Cane Run are severely denuded due to free grazing of cattle during the park's past history as a University of Kentucky agricultural research facility. The drainage area includes commercial, industrial, agricultural, and residential land uses. Runoff from this stream ultimately recharges the Royal Springs Aquifer, which is a raw water supply for the City of Georgetown municipal water system. The project serves multiple purposes related to the stream and the park as follows:

- Stabilize the channel and banks;
- Restore habitat;
- Reduce peak flows / pollutant loading associated with urban runoff and agricultural activities;
- Create a permanent greenway;
- Reduce flooding by removing artificial restrictions within the floodway, thus reducing potential for property damage and stream channel erosion;
- Reduce pollutant loadings entering Cane Run, which recharges the Royal Springs Aquifer, through use of green infrastructure concepts for minimizing erosion and maximizing infiltration;
- Enhance recreational and educational opportunities within the Urban Service Area by enhancing passive use land within the park system and habitat restoration;
- Assist LFUCG and other watershed stakeholders in promoting / implementing future water quality initiatives within the basin including through the creation of a greenway to permanently buffer and protect the stream. LFUCG strongly believes that increased emphasis on quality of life perceptions is critical to the success of holistic, long-range watershed planning.

This project will benefit the public and the environment by improving floodplain conditions that contribute to flood water backup and stream channel erosion that generally impact floodplain ecosystems, as well as by reducing pollutant loads in downstream sections of Cane Run and the Royal Springs Aquifer. This area was identified as a beneficial greenway area in the conceptual 2002 Greenway Master Plan, which identifies potential generalized locations for conservation greenways.

The project site is located entirely upon an LFUCG-owned parcel PVA#10056570 designated as “Coldstream Park,” 1875 Newtown Pike, Lexington, Kentucky. Coldstream Park consists of floodplain property owned by LFUCG that was previously part of the University of Kentucky’s agricultural research farm. The stream section identified for this project is a 4,415-linear foot reach of Cane Run (HUC-14 #05100205-280-200) within the park, between Citation Boulevard and Interstate 75.

Coordinates: 38.10391751 N; -84.4985777 W (downstream end of project)
38.09189968 N; -84.50138092 W (upstream end of project)

The main stem of the existing stream varies in distance from the property lines, from a minimum distance of approximately 50 feet to a maximum distance of over 400 feet. The average distance from the centerline of the stream to the property line is approximately 300 feet. Currently, the land is used as a passive recreational park. Existing infrastructure includes:

- A section of the Legacy Trail, constructed with permeable concrete, which runs through the park parallel to the stream reach of interest. The Legacy Trail was constructed in 2010 and runs from downtown Lexington to the Kentucky Horse Park. A 40-foot wide permanent trail easement, currently held by LFUCG, encompasses the trail.
- An existing asphalt parking lot used for access to the park which is located within the project area.
- A sanitary sewer main which runs through the property parallel to the stream.
- The Cane Run sanitary sewer pump station which is located downstream of the SEP area and does not conflict with the project design or activities.

Current Project Status Related to Consent Decree Project Requirements

1. **Consent Decree Budget Requirements:** LFUCG shall spend at least \$1,000,000 for the implementation of this SEP, including design and construction. Programmatic and administrative costs incurred by LFUCG will not be counted against the dollar amount devoted to this project.

Current Project Budget Estimate (see *Appendix C* for more detail):

a. Engineering and Environmental Services Consultant Fees:	\$246,750
b. Preliminary Construction Cost Estimate (base bid):	<u>\$876,466</u>
	\$1,123,216

Although the project cost estimate is currently over the \$1,000,000 minimum expenditure, additional design alternates (*e.g.*, additional water quality treatment, surface water features) have been considered to ensure meeting the budget requirement at the end of construction. These alternates are not shown on the design plans, but are discussed in some of the supplemental documentation.

[Note: Some of the proposed alternates are located on an adjacent parcel owned by the University of Kentucky (UK). The university has expressed interest in funding construction of a portion of Alternate 1, which includes additional constructed wetlands and a fishing pond. Any improvements funded through a source other than LFUCG and/or located in an area not covered by a Conservation Easement will not be presented as part of the SEP or as SEP eligible costs in the SEP Completion Report.]

2. Consent Decree Schedule Requirements:

- The duration of the SEP will be five (5) years from the date of entry of the Consent Decree (January 3, 2011).
- Development of the Coldstream Park Greenway Plan by a selected design firm for submittal to EPA within 24 months of Effective Date (*i.e.*, January 3, 2013). Final designs will be submitted to EPA for review and approval to ensure that the designs are consistent with EPA’s Stream Mitigation Guidelines and conservation easement principles.
- Procure necessary state and federal permits for the project.
- Construct and implement Greenway Plan within 60 months of Effective Date (*i.e.*, January 4, 2016).

Current Project Schedule:

Task	Date	Status
Request for Proposals Advertised for Design Team	11/29/2011	Complete
Notice to Proceed for Selected Design Team	03/05/2012	Complete
30% Design Submittal	06/15/2012	Complete
75% Design Submittal	10/29/2012	Complete
Coldstream Park Greenway Plan Submittal to EPA	12/21/2012	Complete
CONSENT DECREE DEADLINE FOR GREENWAY PLAN SUBMITTAL	01/03/2013	Met
Receive EPA Comments	03/01/2013 (est.)	
Revisions per EPA Review	05/2013 (est.)	
Final Permit Applications	05/2013 (est.)	
Final Permit Approvals	11/2013 (est.)	
Bid for Construction	11/2013 (est.)	
Construction Start	04/2014 (est.)	
Construction Completion	07/2015 (est.)	
Record Drawings/FEMA LOMR Submittal	08/2015 (est.)	
CONSENT DECREE DEADLINE FOR CONSTRUCTION COMPLETION	01/04/2016	
SEP Completion Report to EPA Deadline	04/04/2016	

- 3. Consent Decree Easement Requirement:** The SEP requires the establishment of a conservation easement, in a format substantially similar to that provided in Appendix J-1, to permanently protect the use of the greenway as designed, with exceptions for work necessary

for maintenance, repair or replacement of existing utilities, and certain other activities that are consistent with the greenway purpose. The SEP requires that the Conservation Easement be deeded to the Lexington-Fayette Urban County Greenspace Trust, Inc.

Current Easement Status: A draft of the conservation easement is provided in *Appendix D*. The Greenspace Trust, Inc. is regularly briefed on the project. Once project permitting is complete, the easement will be signed and recorded at the Fayette County Clerk's Office.

4. **Consent Decree Design Consultant Requirement:** At a minimum, the design consultant(s) should be thoroughly familiar with Stream Mitigation Guidelines published by EPA and/or the Kentucky Energy and Environment Cabinet's Department for Environmental Protection, fluvial process and channel evolution and natural channel design or alternative stream design methodologies.

Current Design Consultant Status: The design team selected via Request for Proposal and LFUCG's formal consultant selection process meets all of the conditions of the Consent Decree for expertise and experience in the field of natural channel design and fluvial process and channel evolution. The team includes the following principal team members and firms:

CDP Engineers - Sandy Camargo (Principal); Elizabeth Bullock (Project Manager)
3250 Blazer Parkway, Lexington, KY 40509
(lead design firm, project management, construction plans, permitting, technical specifications, bidding, resident construction observation, greenway planning, easements)

Riverine Systems, LLC - Arthur Parola, PhD, PE, University of Louisville Stream Institute
15321 Champion Lakes Place, Louisville, KY 40245
(stream morphology, 2-dimensional shear stress modeling, stream assessments, project QA/QC, legacy sediments and bedload)

Tom Biebighauser - Center for Wetlands and Stream Restoration, U.S. Forest Service
2375 KY HWY 801 South, Morehead, KY 40351
(stream assessments, constructed wetlands, vernal pools, amphibian habitat design)

Kentucky Geological Survey - Jim Currens
University of Kentucky, Lexington, KY 40506
(karst, hydrogeology, risk management)

Skybax Ecological Services, LLC - Gary Libby
P.O. Box 1093, Berea, KY 40403
(riparian vegetation and habitat, stream morphology, stream assessments, threatened and endangered species coordination, resident construction observation)

Hazen and Sawyer - Tim Schueler, PE; Martha Cardona, PhD, PE; John Steinmetz, PE
444 Lewis Hargett Circle, Lexington, KY 40503
(hydrology and hydraulics, shear stress analyses, stream assessments, stream morphology)

Consulting Services Incorporated Kentucky, LLC - Bruce Hatcher, PE
250 Gold Rush Road, Suite 6, Lexington, KY 40503
(geotechnical, groundwater, soils, bedrock surveys)

Integrated Engineering, LLC - Steve Garland, PE; Mark Scott, PLS
1716 Sharkey Way, Suite 200, Lexington, KY 40511
(land survey, easements, CLOMR/LOMR)

5. **Consent Decree Project Design Requirements:** The SEP requires the project to include at a minimum the following design components:
- Natural stream design parameters appropriate to the Inner Bluegrass – *e.g.*, “E” channel sinuosity, pool-riffle-run-glide ratios, bankfull heights, etc. The elevation of the baseflow will be adjusted for maximum habitat improvements and floodplain hydrology restoration.
 - Backwater areas and vernal pools to enhance amphibian habitat.
 - Infiltration basins built in the floodplain to provide additional terrestrial habitat and to enhance pollutant uptake, groundwater recharge, and restoration of healthy base flows.
 - Habitat restoration in bordering areas throughout the greenway.

Current Design Status: The design plans for EPA review are provided in **Appendix A**. The specifications are provided in **Appendix B**. The design includes the following main components which meet the requirements of the Consent Decree:

- Construction of 4,500 linear feet of low-flow stream channel utilizing natural channel design techniques, including sinuosity, pool-riffle-run-glide profile pattern, connected floodplain, grade control structures, reestablished bed material, etc. Stream is designed to withstand shear stresses for flows up to the 100-year design storm.
- Floodplain excavation to reconnect the low-flow channel to an extended floodplain. Floodplain is designed to withstand shear stresses up to the 100-year design storm.
- Construction of floodplain pocket wetlands for increased aquatic and amphibian/terrestrial habitat.
- Construction of surface water wetlands and bio-swale adjacent to the excavated floodplain for water quality treatment of stormwater runoff through infiltration and evapotranspiration.
- Construction of vernal pools outside of the excavated floodplain for amphibian/terrestrial habitat.
- Enhancement of aquatic habitat and increase of seasonal base flows through use of on-site clay material underlying the excavated floodplain and stream bed. Currently, Cane Run is completely dry through this section most of the year, resulting in no

aquatic habitat. This is due to the intense karsts swallets lining the stream bed, which convey any surface water flow entering the stream into an underground cave system. Groundwater test pits showed no groundwater for 30 feet of depth. Therefore, in contrast to most stream restoration projects which seek to raise groundwater to increase base flow duration, this project is designed to maintain surface flow in the channel and prevent loss to existing underground karst landforms.

- 100- to 200-foot wide replanted native riparian zone.
- Educational signage along existing Legacy Trail within the Coldstream Park Greenway.
- Transition zone on the upstream end of the project to ensure channel stability, widen flow to enlarged floodplain, and splay transported sediments.
- Transition zone on the downstream end of the project to ensure channel stability and constrict flow back to the tighter existing channel section.

The following supporting documentation provides additional detail on the project design:

Appendix E: Preliminary Design: Risk Mitigation Plan (03/30/12); Technical Memorandum (06/15/12)

Appendix F: Stream Assessments: Stream Assessment Survey Results (07/13/12); Stream Assessment and Monitoring Plan (03/30/12)

Appendix G: Geotechnical Reports: Streambed Particle Size Distribution; Test Pit Results (05/02/12); Rock Soundings Results (04/11/12)

Appendix H: Preliminary Hydrology/Hydraulics Analyses Results (11/12/12)

Appendix I: Resource Survey Documentation: Kentucky Heritage Council Response and Survey Form (09/24/12); Cultural Resource Survey of the Proposed Cane Run Stream Restoration Project in Coldstream Park in Fayette County, Kentucky (08/24/12); Endangered Species Act Section 7 Biological Assessment Documentation