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MEMORANDUM

October 13, 2026
File No. 0216304

SUBJECT: Periodic Inflow Design Flood Control System Plan
Associated Electric Cooperative, Inc.
Thomas Hill Energy Center – Cell 001
Clifton Hill, Missouri

Haley & Aldrich, Inc. (Haley & Aldrich) developed this Periodic Inflow Design Flood (IDF) Control System Plan (IDFCS Plan or Plan) on behalf of Associated Electric Cooperative, Inc. (AECI) for the existing coal combustion residuals (CCR) surface impoundment referred to as Ash Pond 1 – Cell 001 (Cell 001 or Unit) at the Thomas Hill Energy Center (THEC) in Clifton Hill, Missouri. This Plan was developed on behalf of AECI in accordance with the U.S. Environmental Protection Agency's Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, Title 40 Code of Federal Regulations (CFR) Part 257, Subpart D (CCR Rule), effective October 19, 2015, including subsequent revisions, specifically related to 40 CFR §257.82. The Cell 001 existing conditions and supporting documentation have been reviewed and associated stormwater modeling and analysis performed to satisfy the Inflow Design Flood Control System Plan requirements of 40 CFR §257.82 described below. This Plan has been updated to account for system modifications and meets the requirements to complete a periodic update every five years in accordance with 40 CFR §257.82(c)(4).

In September 2021, the Unit ceased receiving CCR and non-CCR wastestreams from THEC and initiated closure thereafter. CCR material has been removed since the previous periodic update, and the area was reconfigured as a secondary (non-CCR) impoundment to support management of low-volume wastewater discharges at the site. Cell 001 remains regulated as a CCR surface impoundment because closure was not complete at the time of this periodic update, although it no longer treats, stores, or disposes of CCR material.[1]

40 CFR §257.82(a): The owner or operator of an existing or new CCR surface impoundment, legacy CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (a)(2) of this section.

40 CFR §257.82(a)(1): The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

[1] According to 40 CFR §257.53, "active life or in operation" is defined as the period of operation beginning with the initial placement of CCR in the CCR unit and ending at completion of closure activities in accordance with 40 CFR §257.102.

Cell 001 was historically used for settling and temporary wet storage of bottom ash and boiler slag sluiced from THEC. As noted above, the Unit ceased receipt of CCR and non-CCR wastestreams, initiated closure, and completed removal of CCR material. The Unit has been reconfigured as a secondary (non-CCR) impoundment to support management of low-volume wastewater discharges at the site since the previous periodic update. Plant process inflows are now limited to periodic discharges from the Concrete Dewatering Tank (CDT), which is located directly east of Cell 001. The CDT receives CCR sluice water from THEC and boiler wash water. The CDT treats the CCR sluice water and is designed to recirculate a majority of water back to the plant, with occasional treated (non-CCR) blowdowns discharged into the northeastern corner of Cell 001 through a 10-inch-diameter high-density polyethylene pipe. Flows from Cell 001 discharge through a rectangular concrete decant structure equipped with 60-inch-wide aluminum stop logs and a skimmer device and out a 30-inch-diameter concrete outlet pipe to a drainage channel referred to as the West Ditch.

Hydrologic and hydraulic modeling for this Cell 001 IDFCS Plan was performed using HydroCAD Stormwater Modeling System, version 10.20-9a (HydroCAD) in conjunction with the appropriate IDF as determined per the Periodic Hazard Potential Classification Assessment completed under separate cover. The 100-year flood was determined to be the IDF based on results of the hazard potential classification assessment, which is described in more detail below in response to 40 CFR §257.82(a)(3).

The Cell 001 normal operating water level is typically maintained by the skimmer device (elevation [El.] 735.87 feet) with all stop logs installed (up to El. 740.55 feet) to retain the periodic inflows. For the downstream boundary condition, the model sets tailwater at the approximate crown elevation of the West Ditch culvert inlets (El. 735.78 feet), located downstream of the Cell 001 outlet pipe. The model assumed a conservative base flow of 0.20 cubic feet per second (cfs) into Cell 001 during the IDF precipitation event to represent periodic inflows from the CDT. In this condition, the IDF was held in Cell 001 without overtopping the stop logs; therefore resulting in no discharge through the primary spillway of the impoundment. **Table I** summarizes the effects of the IDF peak discharge during normal operation of the impoundment.

Table I: HydroCAD Output Summary (48-hour, 100-year IDF Event)

Parameter	Output Value
Normal pool elevation (feet)	735.87
Primary spillway elevation (feet)	740.55 (stop logs)
Peak flood level (feet)	737.65
Minimum dike elevation (feet)	744.00
Minimum freeboard below dike crest (feet)	6.35
Peak inflow (cfs)	25.86
Peak outflow (cfs)	0.38 (via skimmer)

The results of the HydroCAD analysis confirm the IDF control system for Cell 001 adequately manages flow into the impoundment during and after the IDF peak discharge. The outputs from the HydroCAD model simulations are provided as **Appendix A**. See **Figure 1** for the Cell 001 existing site plan.

40 CFR §257.82(a)(2): The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

The model analyzes the West Ditch downstream of Cell 001 to assess apparent tailwater effects at the discharge point. Based on the HydroCAD analysis, the IDF control system for Cell 001 was determined to adequately manage flow from the impoundment by collecting and controlling the IDF peak discharge. The peak level and resulting freeboard in Cell 001 during the 100-year flood is noted in **Table I**. The HydroCAD model simulation output is provided as **Appendix A**.

40 CFR §257.82(a)(3): The inflow design flood is:

- *i. For a high hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the probable maximum flood;*
- *ii. For a significant hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the 1,000-year flood;*
- *iii. For a low hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the 100-year flood; or*
    - *a. For an incised CCR surface impoundment, the 25-year flood.*

As documented in the most recent Hazard Potential Classification Assessment prepared in accordance with 40 CFR §257.73(a)(2), Cell 001 was determined to have a low hazard potential; therefore, the design event is the 100-year flood. The 100-year flood hydrograph was developed using precipitation-frequency data from National Oceanic and Atmospheric Administration (NOAA) Atlas 14 and transformed to runoff using Natural Resources Conservation Service methodologies implemented in HydroCAD. The NOAA Atlas 14 Point Precipitation Frequency Estimates for Clifton Hill, Missouri are provided as **Appendix B**.

The hydrologic model incorporates watershed-specific characteristics, including drainage area, runoff parameters, and time of concentration, to generate a site-specific inflow hydrograph for routing through the impoundment. The 6-hour, 12-hour, 24-hour, and 48-hour duration 100-year precipitation events were evaluated, and the 48-hour event produced the most adverse hydraulic response, resulting in higher routed water surface elevations within the impoundment. Accordingly, the 100-year, 48-hour event was selected as the governing design condition for this evaluation. This methodology converts the design precipitation event into a corresponding site-specific flood hydrograph and is consistent with established engineering practice for evaluating impoundment performance under the hydrologic loading condition specified by the CCR Rule. Based on the hydrologic and hydraulic evaluation, Cell 001 is capable of containing the 100-year flood event specified for a low hazard potential CCR surface impoundment under 40 CFR §257.82(a)(3). Positive freeboard is maintained throughout the event and overtopping does not occur.

40 CFR §257.82(b): Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3–3.

40 CFR §257.3-3(a): For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended.

40 CFR §257.3-3(b): For purposes of section 4004(a) of the Act, a facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

40 CFR §257.3-3(c): A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by the Administrator under section 208 of the Clean Water Act, as amended.

Discharges from Cell 001 are managed so they do not violate the applicable requirements of the Missouri State Operating Permit issued by the Missouri Department of Natural Resources.

40 CFR §257.82(c)(1): Content of the plan. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).

The Initial IDFCS Plan was prepared in accordance with 40 CFR §257.82(c)(1) and is available on AECI's CCR compliance website. This document and attachments serve as the Periodic IDFCS Plan. Periodic IDFCS plans will be prepared and placed in the facility operating record at five-year increments or whenever there is a change in conditions that would affect the Plan.

40 CFR §257.82(c)(2): Amendment of the plan. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

The IDFCS Plan will be amended whenever there is a change in conditions that would substantially affect the written Plan in effect.

A record of amendments to the Plan is tracked below with the latest version of the IDFCS Plan noted on the first page of the Plan. The version date is based on the date the document is finalized, which may be different from the date on which the document is placed in the CCR Operating Record or the date of subsequent notifications and placement on the CCR website.

Version	Date	Description of Changes Made
1	October 16, 2016	Initial Issuance
2	October 15, 2021	Periodic Update
3	October 13, 2026	Periodic Update

40 CFR §257.82(c)(3): Timeframes for preparing the initial plan

i. Existing CCR surface impoundments. The owner or operator of the CCR unit must prepare the initial inflow design flood control system plan no later than October 17, 2016.

The Initial Plan was prepared within the specified time frame.

ii. New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

Not applicable. Cell 001 is an existing CCR surface impoundment.

40 CFR §257.82(c)(4): Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).

This Plan or any subsequent version of the Plan will be assessed and amended whenever there is a change in operation of the CCR surface impoundment that would substantially affect the Plan or when unanticipated events necessitate a revision to the Plan.

Professional Engineer Certification

40 CFR §257.82(c)(5): The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from the EPA where EPA is the permitting authority stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

I certify that this Periodic Inflow Design Flood Control System Plan for the Ash Pond 1 – Cell 001 CCR surface impoundment at the AECI Thomas Hill Energy Center meets the requirements of 40 CFR §257.82 of the CCR Rule.

Signed: _____
Qualified Professional Engineer

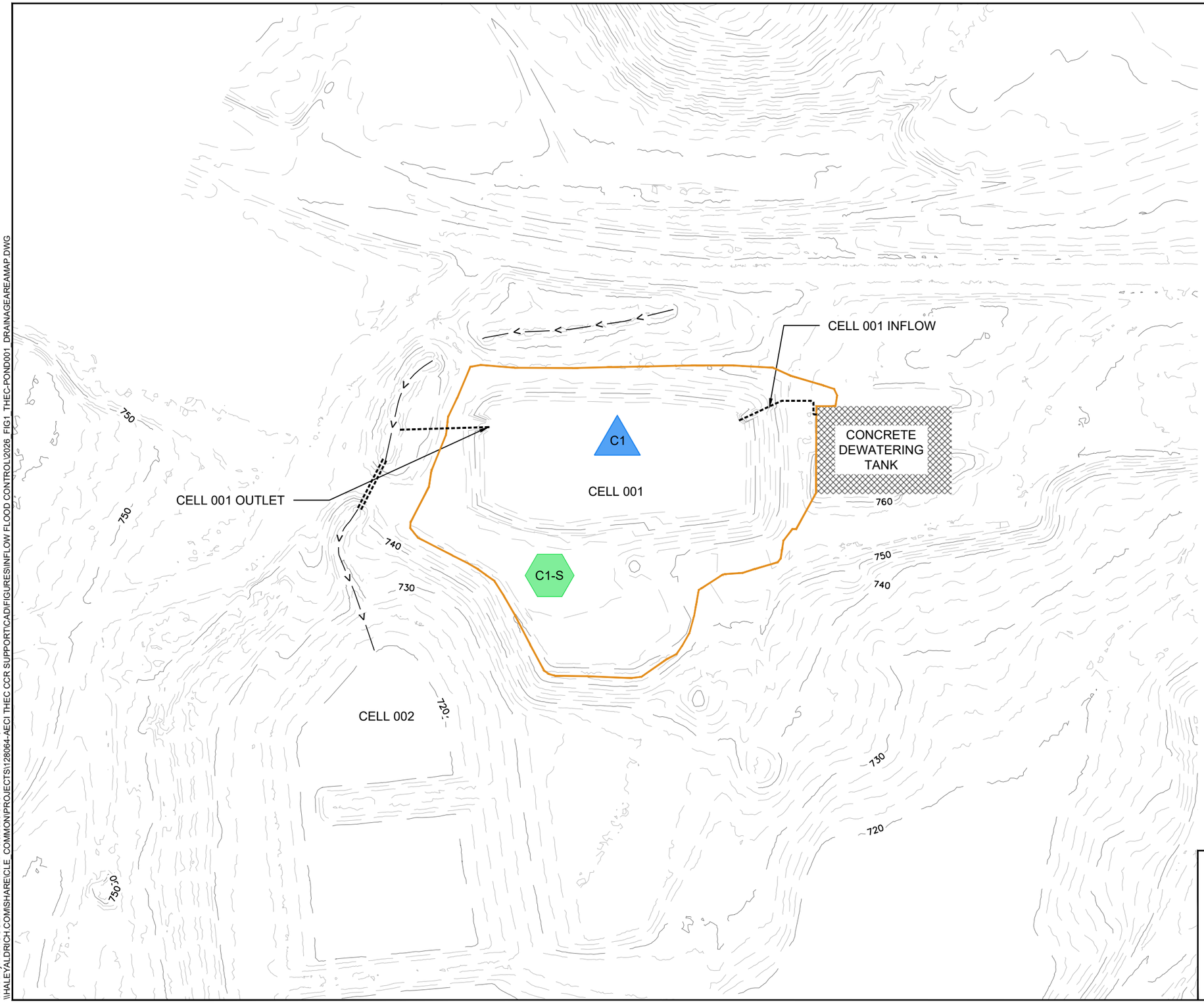
Printed Name: Steven F. Putrich
Missouri License No.: 2014035813
Title: Principal Consultant
Company: Haley & Aldrich, Inc.



Steven F. Putrich

Digitally signed by Steven F. Putrich
Date: 2026.10.14 17:14:20 -04'00'

Figure



LEGEND

- SUBCATCHMENT
- DITCH
- CONCRETE DEWATERING TANK FOOTPRINT
- 10-FT. MAJOR CONTOUR
- 2-FT. MINOR CONTOUR
- CULVERT

NOTES

1. EXISTING TOPOGRAPHY COMPOSITE FROM ASSOCIATED ELECTRIC COOPERATIVE, INC. DATED 2019 AND 2023. HORIZONTAL CONTROL IS BASED ON NAD83 ZONE 15N. VERTICAL CONTROL IS BASED ON NAVD88.

N

0 150 300
SCALE IN FEET

HALEY ALDRICH

ASSOCIATED ELECTRIC COOPERATIVE, INC.
THOMAS HILL ENERGY CENTER
CLIFTON HILL, MISSOURI

CELL 001
DRAINAGE AREA MAP

SCALE: AS SHOWN
OCTOBER 2026

FIGURE 1

Saved by: ABRUGGEMAN Printed: 10/9/2026 3:36 PM Sheet: 1
\\HALEYALDRICH.COM\SHARE\CLE_COMMON\PROJECTS\128064-AECI THEC CCR SUPPORT\CAD\FIGURES\INFLOW FLOOD CONTROL\2026_FIG1_THEC-POND001_DRAINAGEAREAMAP.DWG

Appendix A
HydroCAD Results



Cell 001

Cell 001 Subcat

Subcat Reach Pond Link

Routing Diagram for 2026-THEC-Cell001 Inflow Plan_Skimmer
Prepared by Haley & Aldrich, Inc, Printed 10/9/2026
HydroCAD® 10.20-9a s/n 03902 © 2026 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.527	84	50-75% Grass cover, Fair, HSG D (C1-S)
1.174	91	Gravel roads, HSG D (C1-S)
2.124	98	geomembrane and clay liner area (C1-S)
4.825	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
2.701	HSG D	C1-S
2.124	Other	C1-S
4.825		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	1.527	0.000	1.527	50-75% Grass cover, Fair	
0.000	0.000	0.000	1.174	0.000	1.174	Gravel roads	
0.000	0.000	0.000	0.000	2.124	2.124	geomembrane and clay liner area	
0.000	**0.000**	**0.000**	**2.701**	**2.124**	**4.825**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	C1	733.66	732.16	133.2	0.0113	0.012	0.0	30.0	0.0	

Time span=0.00-50.00 hrs, dt=0.05 hrs, 1001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment C1-S: Cell 001 Subcat Runoff Area=210,177 sf 44.02% Impervious Runoff Depth=7.72"
Flow Length=600' Tc=15.4 min CN=92 Runoff=25.66 cfs 3.103 af

Pond C1: Cell 001 Peak Elev=737.65' Storage=4.467 af Inflow=25.86 cfs 3.930 af
Outflow=0.38 cfs 1.167 af

Total Runoff Area = 4.825 ac Runoff Volume = 3.103 af Average Runoff Depth = 7.72"
55.98% Pervious = 2.701 ac 44.02% Impervious = 2.124 ac

Summary for Subcatchment C1-S: Cell 001 Subcat

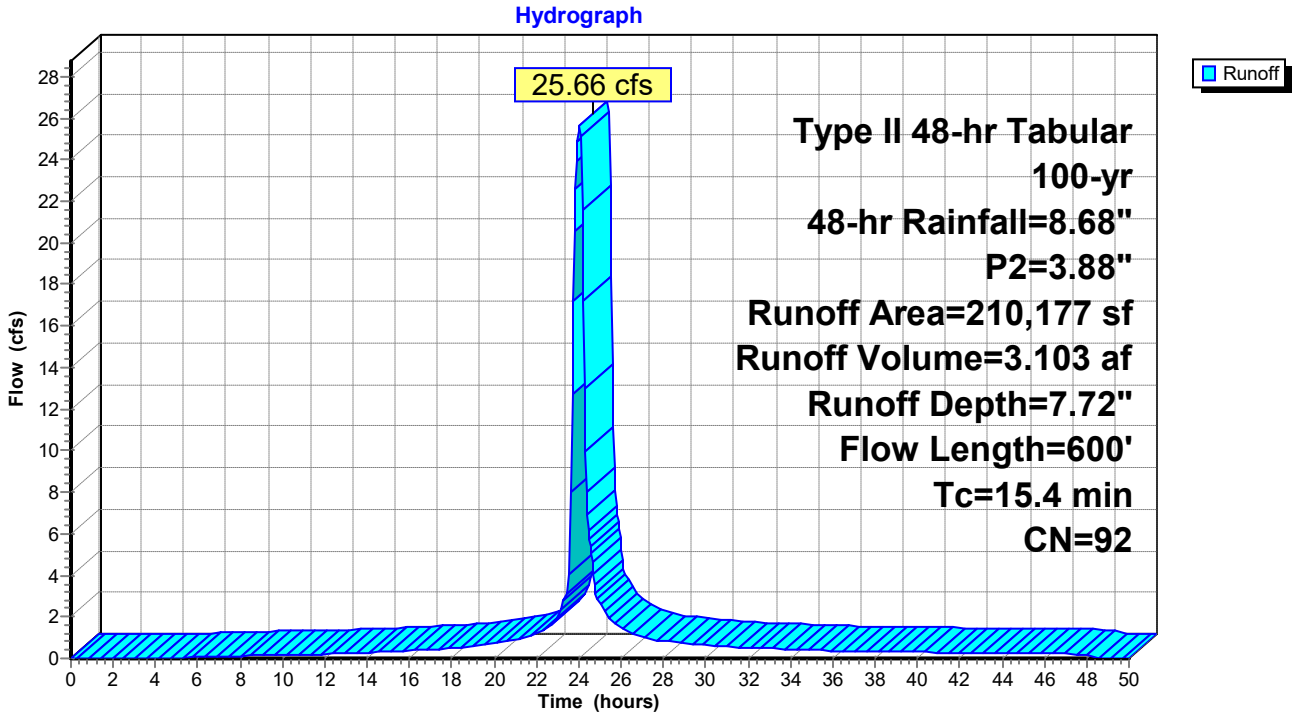
Runoff = 25.66 cfs @ 24.03 hrs, Volume= 3.103 af, Depth= 7.72"
Routed to Pond C1 : Cell 001

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Type II 48-hr Tabular 100-yr, 48-hr Rainfall=8.68", P2=3.88"

	Area (sf)	CN	Description
*	92,523	98	geomembrane and clay liner area
	51,138	91	Gravel roads, HSG D
	66,516	84	50-75% Grass cover, Fair, HSG D
	210,177	92	Weighted Average
	117,654		55.98% Pervious Area
	92,523		44.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0200	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.88"
0.7	100	0.0200	2.28		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.3	85	0.0700	4.26		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.0	25	0.3010	8.83		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
5.5	290	0.0030	0.88		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
15.4	600	Total			

Subcatchment C1-S: Cell 001 Subcat



Summary for Pond C1: Cell 001

Base flow value based on converting 4.85 cfs over a 1-hour purge to a 24-hour period.

Inflow Area = 4.825 ac, 44.02% Impervious, Inflow Depth > 9.77" for 100-yr, 48-hr event
Inflow = 25.86 cfs @ 24.03 hrs, Volume= 3.930 af, Incl. 0.20 cfs Base Flow
Outflow = 0.38 cfs @ 21.10 hrs, Volume= 1.167 af, Atten= 99%, Lag= 0.0 min
Primary = 0.38 cfs @ 21.10 hrs, Volume= 1.167 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.05 hrs
Starting Elev= 735.87' Surf.Area= 1.474 ac Storage= 1.677 af
Peak Elev= 737.65' @ 47.35 hrs Surf.Area= 1.639 ac Storage= 4.467 af (2.790 af above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 329.7 min (1,855.9 - 1,526.2)

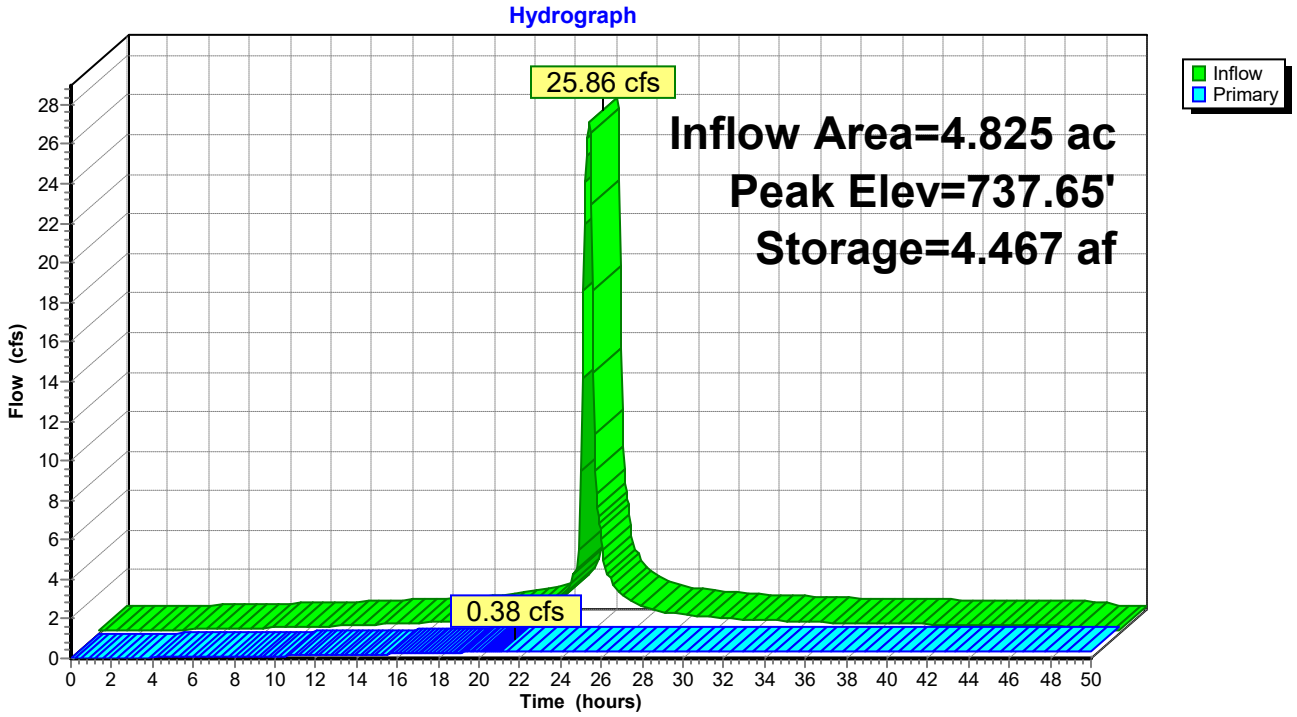
Volume	Invert	Avail.Storage	Storage Description
#1	734.25'	17.067 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
734.25	0.000	0.000	0.000
735.00	1.279	0.480	0.480
736.00	1.503	1.391	1.871
737.00	1.584	1.543	3.414
738.00	1.668	1.626	5.040
739.00	1.755	1.711	6.752
740.00	1.843	1.799	8.551
741.00	1.934	1.888	10.439
742.00	2.025	1.979	12.419
743.00	2.124	2.074	14.493
744.00	2.317	2.221	16.714
744.15	2.390	0.353	17.067

Device	Routing	Invert	Outlet Devices
#1	Primary	733.66'	**30.0" Round Culvert** L= 133.2' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 733.66' / 732.16' S= 0.0113 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	740.55'	**5.3' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.5' Crest Height
#3	Device 1	735.87'	**0.380 cfs Constant Flow/Skimmer** Phase-In= 0.33'

Primary OutFlow Max=0.38 cfs @ 21.10 hrs HW=736.20' TW=735.78' (Fixed TW Elev= 735.78')
└─**1=Culvert** (Passes 0.38 cfs of 13.72 cfs potential flow)
  ├─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**3=Constant Flow/Skimmer** (Constant Controls 0.38 cfs)

Pond C1: Cell 001



Appendix B
NOAA Rainfall Data

NOAA Atlas 14, Volume 8, Version 2
Location name: Clifton Hill, Missouri, USA*
Latitude: 39.5435°, Longitude: -92.637°
Elevation: 711 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.405** (0.328-0.498)	**0.468** (0.378-0.576)	**0.570** (0.459-0.703)	**0.654** (0.524-0.810)	**0.769** (0.594-0.975)	**0.857** (0.647-1.10)	**0.944** (0.688-1.24)	**1.03** (0.721-1.38)	**1.15** (0.770-1.58)	**1.23** (0.808-1.72)
10-min	**0.593** (0.480-0.729)	**0.685** (0.554-0.843)	**0.834** (0.673-1.03)	**0.958** (0.767-1.19)	**1.13** (0.870-1.43)	**1.25** (0.947-1.61)	**1.38** (1.01-1.81)	**1.51** (1.06-2.03)	**1.68** (1.13-2.31)	**1.80** (1.18-2.52)
15-min	**0.723** (0.585-0.890)	**0.835** (0.676-1.03)	**1.02** (0.820-1.26)	**1.17** (0.936-1.45)	**1.37** (1.06-1.74)	**1.53** (1.16-1.96)	**1.68** (1.23-2.21)	**1.84** (1.29-2.47)	**2.05** (1.38-2.82)	**2.20** (1.44-3.08)
30-min	**1.02** (0.827-1.26)	**1.19** (0.965-1.47)	**1.47** (1.18-1.81)	**1.70** (1.36-2.10)	**2.00** (1.54-2.53)	**2.23** (1.68-2.86)	**2.45** (1.79-3.21)	**2.68** (1.87-3.59)	**2.97** (1.99-4.08)	**3.18** (2.08-4.44)
60-min	**1.30** (1.05-1.59)	**1.54** (1.25-1.90)	**1.96** (1.58-2.41)	**2.30** (1.84-2.85)	**2.79** (2.16-3.56)	**3.17** (2.40-4.09)	**3.56** (2.60-4.68)	**3.96** (2.77-5.33)	**4.49** (3.02-6.20)	**4.90** (3.21-6.85)
2-hr	**1.57** (1.28-1.92)	**1.89** (1.54-2.32)	**2.44** (1.98-2.99)	**2.91** (2.35-3.58)	**3.58** (2.79-4.55)	**4.11** (3.13-5.28)	**4.66** (3.43-6.11)	**5.24** (3.69-7.02)	**6.02** (4.08-8.26)	**6.63** (4.38-9.20)
3-hr	**1.73** (1.41-2.10)	**2.10** (1.72-2.56)	**2.75** (2.24-3.36)	**3.31** (2.68-4.06)	**4.14** (3.25-5.26)	**4.81** (3.68-6.17)	**5.51** (4.08-7.21)	**6.25** (4.43-8.37)	**7.28** (4.96-9.97)	**8.09** (5.36-11.2)
6-hr	**2.06** (1.70-2.49)	**2.50** (2.06-3.03)	**3.27** (2.68-3.97)	**3.96** (3.22-4.82)	**4.97** (3.95-6.31)	**5.81** (4.49-7.43)	**6.70** (5.00-8.74)	**7.66** (5.48-10.2)	**9.00** (6.19-12.3)	**10.1** (6.72-13.8)
12-hr	**2.49** (2.06-2.99)	**2.95** (2.44-3.55)	**3.77** (3.11-4.54)	**4.50** (3.69-5.44)	**5.57** (4.45-7.01)	**6.46** (5.03-8.20)	**7.41** (5.56-9.58)	**8.42** (6.06-11.1)	**9.83** (6.81-13.3)	**11.0** (7.38-14.9)
24-hr	**2.95** (2.46-3.52)	**3.42** (2.85-4.08)	**4.24** (3.52-5.08)	**4.97** (4.10-5.98)	**6.06** (4.88-7.57)	**6.97** (5.46-8.77)	**7.92** (6.00-10.2)	**8.95** (6.50-11.8)	**10.4** (7.25-14.0)	**11.5** (7.82-15.6)
2-day	**3.38** (2.84-4.01)	**3.88** (3.26-4.61)	**4.76** (3.98-5.66)	**5.54** (4.61-6.62)	**6.70** (5.43-8.30)	**7.66** (6.05-9.58)	**8.68** (6.61-11.1)	**9.77** (7.14-12.7)	**11.3** (7.94-15.0)	**12.5** (8.54-16.8)
3-day	**3.68** (3.10-4.34)	**4.22** (3.56-4.99)	**5.17** (4.34-6.13)	**6.02** (5.02-7.16)	**7.26** (5.89-8.94)	**8.28** (6.55-10.3)	**9.35** (7.15-11.9)	**10.5** (7.70-13.6)	**12.1** (8.54-16.0)	**13.4** (9.17-17.9)
4-day	**3.94** (3.33-4.64)	**4.52** (3.81-5.33)	**5.52** (4.65-6.53)	**6.41** (5.37-7.61)	**7.72** (6.28-9.48)	**8.79** (6.98-10.9)	**9.91** (7.60-12.5)	**11.1** (8.17-14.4)	**12.8** (9.04-16.9)	**14.1** (9.70-18.8)
7-day	**4.64** (3.94-5.44)	**5.28** (4.48-6.19)	**6.38** (5.40-7.50)	**7.36** (6.20-8.69)	**8.80** (7.20-10.7)	**9.98** (7.97-12.3)	**11.2** (8.66-14.1)	**12.5** (9.28-16.1)	**14.4** (10.2-18.9)	**15.9** (11.0-21.0)
10-day	**5.28** (4.50-6.16)	**5.97** (5.09-6.98)	**7.17** (6.09-8.40)	**8.23** (6.95-9.68)	**9.78** (8.04-11.9)	**11.1** (8.86-13.6)	**12.4** (9.60-15.5)	**13.8** (10.3-17.7)	**15.8** (11.3-20.7)	**17.4** (12.1-22.9)
20-day	**7.11** (6.10-8.24)	**8.02** (6.88-9.31)	**9.57** (8.18-11.1)	**10.9** (9.27-12.7)	**12.8** (10.6-15.4)	**14.4** (11.6-17.4)	**15.9** (12.4-19.7)	**17.6** (13.1-22.3)	**19.8** (14.3-25.7)	**21.6** (15.1-28.3)
30-day	**8.64** (7.45-9.98)	**9.78** (8.42-11.3)	**11.7** (10.0-13.5)	**13.2** (11.3-15.4)	**15.5** (12.8-18.4)	**17.2** (13.9-20.7)	**18.9** (14.8-23.3)	**20.8** (15.6-26.1)	**23.2** (16.7-29.9)	**25.1** (17.6-32.7)
45-day	**10.6** (9.17-12.2)	**12.0** (10.4-13.8)	**14.3** (12.4-16.5)	**16.2** (13.9-18.8)	**18.8** (15.6-22.3)	**20.8** (16.9-24.9)	**22.8** (17.8-27.8)	**24.8** (18.6-30.9)	**27.3** (19.8-35.0)	**29.3** (20.7-38.0)
60-day	**12.3** (10.6-14.1)	**14.0** (12.1-16.0)	**16.6** (14.4-19.2)	**18.8** (16.2-21.7)	**21.7** (18.0-25.6)	**23.9** (19.4-28.5)	**26.1** (20.4-31.7)	**28.1** (21.2-35.0)	**30.8** (22.4-39.2)	**32.8** (23.2-42.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

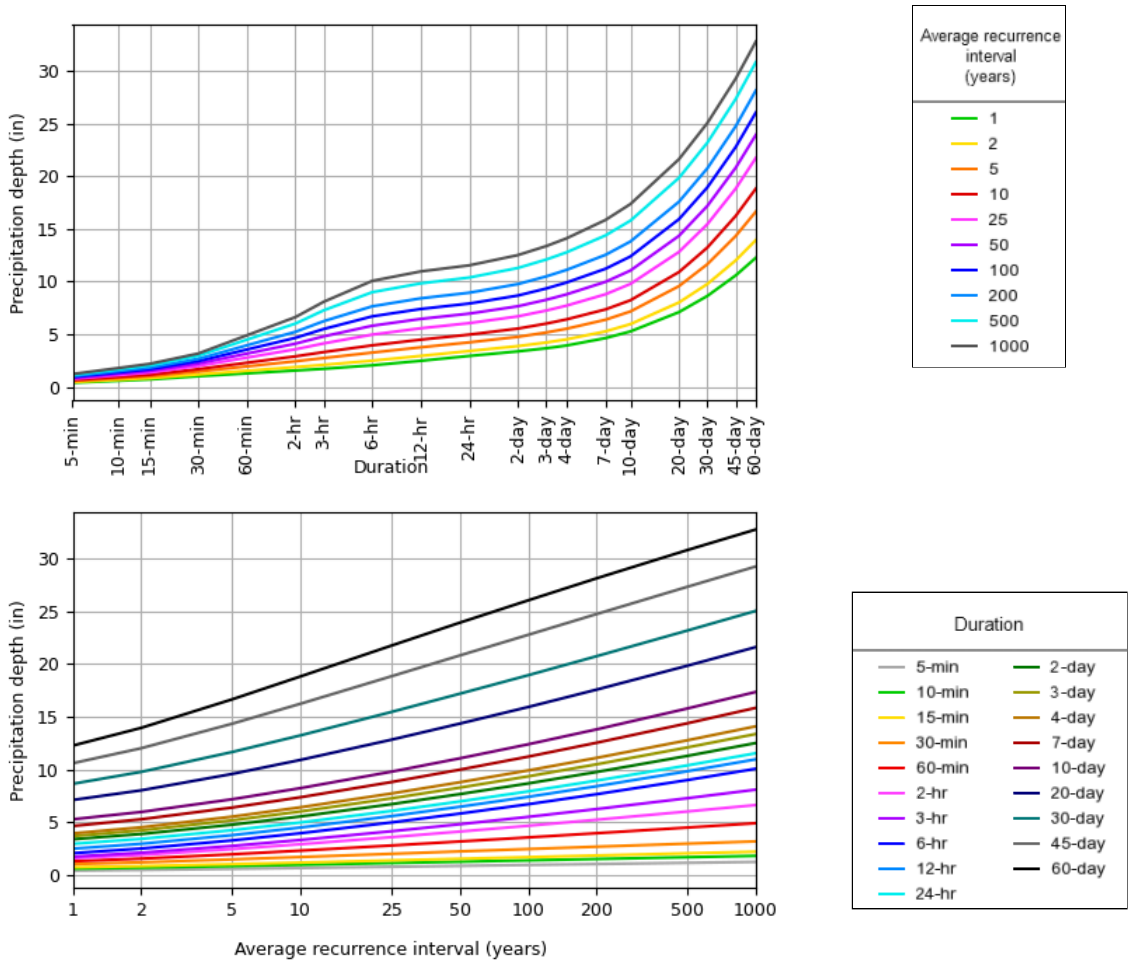
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 39.5435°, Longitude: -92.6370°



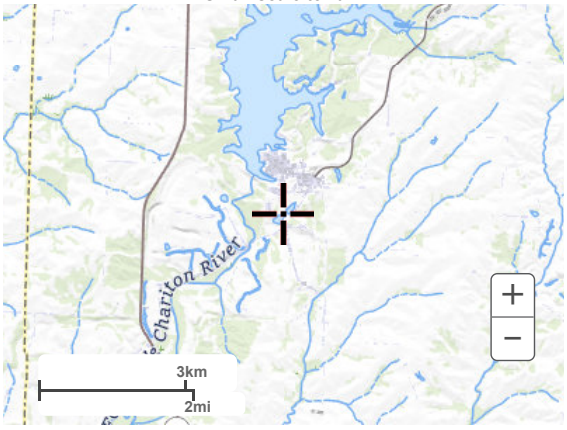
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Maps & aerials

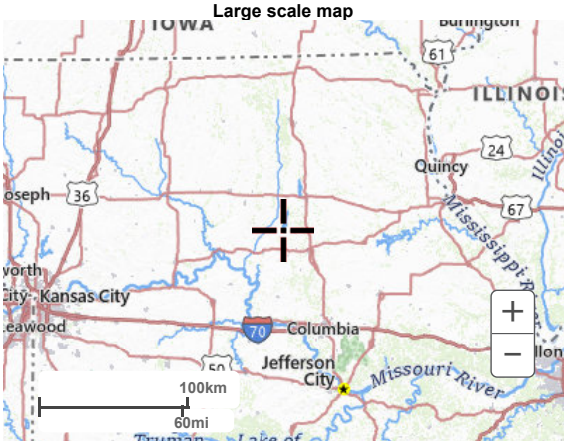
Small scale terrain



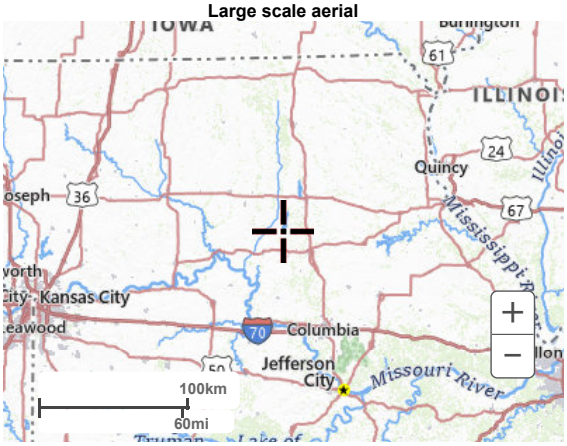
Large scale terrain



Large scale map



Large scale aerial



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