

**BOA Meeting Agenda
Peculiar City Board of Aldermen
Worksession Meeting and Public Hearing
City Hall – 250 S. Main St
Monday January 4, 2016 6:30 p.m.**

Notice is hereby given that the Board of Aldermen of the City of Peculiar will hold a regularly scheduled meeting on Monday, January 4, 2015 at 6:30 pm, in the Council Chambers at 250 S. Main St. Representatives of the news media may obtain copies of this notice by contacting the City Clerk at City Hall, 250 S. Main St Peculiar, MO 64078 or by calling 816-779-2221. All proposed Ordinances and Resolutions will be available for viewing prior to the meeting in the Council Chambers.

1. Call to Order
2. Pledge of Allegiance
3. Roll Call
4. City Clerk – Read the Board of Alderman Statement
5. Unfinished Business –
 - A. Bill No. 2015-30 - AN ORDINANCE OF THE BOARD OF ALDERMEN OF THE CITY OF PECULIAR, MISSOURI APPROVING THE REPLAT OF BRADLEY’S CROSSING CONDOMINIUMS LOTS 1 & 2 TO BRADLEY’S CROSSING LOTS 114 THRU 129 AND TRACTS E & F SUBMITTED BY SALLEE REAL ESTATE INVESTMENTS, LLC.
2nd Reading
6. Topic for Discussion –
 - A. Peculiar Detention Basin - Report by Bartlett & West
 - B. Board of Alderman Policy on Code Enforcement – Alderman Jerry Ford
 - C. New Utility Billing for Customers – Benjamin Hart
7. Aldermen Concerns
8. Alderman Directives
9. Executive Session –

The City Attorney Reid Holbrook has requested a 40-minute Executive Session, per RSMo. 610.021(13)
10. Adjournment

City Administrator
Brad Ratliff

City Clerk
Janet Burlingame

City Engineer
Carl Brooks

Business Office
Trudy Prickett



Chief of Police
Harry Gurin

City Planner
Cliff McDonald

City Attorney
Reid Holbrook

Parks Director
Grant Purkey

Municipal Offices – 250 S. Main Street, Peculiar, MO 64078
Phone: (816)779-5212 Facsimile: (816)779-1004

To: Board of Aldermen
From: Clifford L. McDonald
Date: January 4th, 2016
Re: RePlat Application for all of Bradley’s Crossing Condominiums Lots 1 & 2, to Lots 114 thru 129 and Tracts E & F, containing 5.48 Acres more or less, submitted by Sallee Real Estate Investments, LLC.

GENERAL INFORMATION

Applicant: Sallee Real Estate Investments, LLC.

Status of Applicant: N/A

Requested Actions: Board of Aldermen to consider the Ordinance to approve the RePlat Application for Bradley’s Crossing Condominiums Lots 1 & 2, to Lots 114 thru 129 and Tracts E & F, containing 5.48 Acres more or less for its Second Reading.

Date of Application: November 18, 2015

Purpose: To review the RePlat Application for Bradley’s Crossing Condominiums Lots 1 & 2, to Lots 114 thru 129 and Tracts E & F submitted by Sallee Real Estate Investments, LLC and consider the Second Reading of the Ordinance for approval.

Property Location (if applicable): Bradley’s Crossing Condominiums Lots 1 & 2.

PROPOSAL

See “Requested Actions” above.

PREVIOUS ACTIONS

1. The Planning Commission approved the Final Plat of Bradley’s Crossing Phase 3 in July 2006 and the Board of Aldermen approved the Final Plat of Bradley’s Crossing Phase 3 on July 18th, 2006 (see Atch 2).
2. The RePlat of Bradley’s Crossing Phase 3 to Bradley’s Crossing Condominiums was approved by the Planning Commission in July 2007 and the Board of Aldermen approved the RePlat Bradley’s Crossing Condominiums on July 3rd, 2007 (see Atch 3).
3. The Planning Commission held a Public Hearing on the RePlat Application of Bradley’s Crossing Condominiums Lots 1 & 2 on December 3rd, 2015. The Planning Commission approved the RePlat Application of Bradley’s Crossing Condominiums at that meeting - no Formal Protests have been received by the City.

4. The Board of Aldermen held a Public Hearing on the RePlat Application of Bradley’s Crossing Condominiums Lots 1 & 2 on December 21st, 2015. The Board approved the First Reading of the Ordinance to approve the RePlat Application of Bradley’s Crossing Condominiums at that meeting, with direction to Staff to amend Section 3 of the Ordinance to clarify the Park requirements. No Formal Protests against this RePlat have been received by the City.
5. The City of Peculiar and Sallee Real Estate Investments, LLC entered into a Development Agreement in November 2014 (See Attached). This Agreement identifies the shared maintenance cost of the existing common areas for 4 years, and the transfer of ownership of these areas (currently owned by the City of Peculiar) to the Bradley’s Crossing Property Owner’s Association (POA). TRACT E, identified on the RePlat Application is now owned by the City and will have its ownership transferred to the POA per the Development Agreement.

KEY ISSUES

In order for the Commission to recommend approval or disapproval of a RePlat/Final Plat application (Map Amendment), or for the Board to approve or deny an application for a map amendment, they shall make findings of fact to determine whether the application is found to be compatible with the following:

1. **Consistency with the Comprehensive Plan, neighborhood development plan (if applicable) and any other official planning and development policies of the City;**
 - a. The RePlat Application (see attach 4) will reduce the minimum Side Yard distance required by the Municipal Code, Section 400.400, A.3.c (see page 8) from “15 feet or the height of the adjacent building wall” (in this case 16.2 feet) to a minimum distance of ten (10) feet.
 - b. The original Plat of Bradley’s Crossing – Phase 3 (see Atch 2) had individual lots (109 thru 129) with side yards of ten (10) feet. The underground utilities (water, sanitary sewer mains and especially the sanitary sewer main “wye/lot”connections) are installed with these lot dimensions.
 - c. Bradley’s Crossing – Phase 3 was Re-platted in July, 2007 as Bradley’s Crossing Condominiums; this replat created Lots 1, 2 & 3 and rescinded both the individual lots and their side yard distance of 10 feet (see Atch 3).
 - d. District R-3 Multi-Family Dwelling side yard distances vary between Peculiar and our neighboring cities (see pages 5 - 7); for comparison purposes they are:
 - i. City of Peculiar: 15 feet or the height of the adjacent building wall
 - ii. City of Belton: 5 feet
 - iii. City of Raymore: 10 feet (20 foot separation between buildings)
 - iv. City of Harrisonville: 15 feet
 - e. Impact of a 16.2 feet Side Yard distance on the development of Lot 1 and Lot 2.
 - i. The new Quadplexes built by Sallee Real Estate Investments are 70 feet wide; with a 16.2 foot side yard each Quadplex would require a lot width of 102.4 feet
 - ii. The Duplex built by Sallee Real Estate Investments is 35 feet wide; with a 16.2 foot side yard each Duplex would require a lot width of 67.4 feet
 - iii. The original Bradley’s Crossing Phase 3 Plat indicated 14 Quadplexes and 2 Duplexes (60 Dwelling Units) - (see Atch 1, with building footprints).
 - iv. The City’s “15 feet or the height of the adjacent building wall” Side Yard requirement (in this case 16.2 feet) was adopted in November 2008; this requirement reduces development by 2 Quadplexes to 52 Dwelling Units.

2. **The impact of projected vehicular traffic volumes and site access is not detrimental with regard to the surrounding traffic flow, pedestrian safety and accessibility of emergency vehicles and equipment;**
 - a. The property which comprises the RePlat Application, Bradley’s Crossing Condominiums, is currently zoned R-3, Multiple-Family Dwelling District. The RePlat as proposed would reinstate the Original Plat & housing density the development was designed, approved and constructed for. Vehicular traffic volumes and site access are not changed by this proposed RePlat and it will not be detrimental with regard to surrounding traffic flow, pedestrian safety nor accessibility of emergency vehicles and equipment on Bradley’s Parkway.

3. **Adequacy of existing public utilities and facilities or of provisions to accommodate resulting additional demands which may be imposed upon roads and streets, water supply and storage, storm sewerage, sanitary sewerage and wastewater treatment;**
 - a. The RePlat as proposed would reinstate the Original Plat and housing density that Bradley’s Crossing Condominiums were designed and constructed for. There is no demand increase imposed upon roads, streets, water supply, sanitary sewerage or storm sewerage resulting from this RePlat.

4. **Compatibility of the proposed district classification with nearby properties;**
 - a. The property which comprises the RePlat Application of Bradley’s Crossing Condominiums, is currently zoned R-3, Multiple-Family Dwelling District. Properties along the North border are zoned I-1, Light Industrial District and the properties to the West & South are zoned R-1, Single Family Dwelling District. No change of Zoning is proposed, nor required, for this RePlat and this application is fully compatible with adjoining properties.

5. **If vacant, the length of time the property has remained vacant as zoned.**
 - a. The Final Plat of Bradley’s Crossing Phase 3 was approved as a Multiple-Family Dwelling District in July 2006. Bradley’s Crossing Phase 3 was subsequently RePlatted as Bradley Crossing Condominiums in July 2007. Lots 1 & 2 of Bradley’s Crossing Condominiums have remained vacant for nine (9) years.

STAFF COMMENTS AND SUGGESTIONS

The RePlat Application for Bradley’s Crossing Lots 114 Thru 129 and Tracts E & F has the full approval of the Planning Commission following their Public Hearing and the Commission recommends approval by the Board of Aldermen following another Public Hearing. The proposed RePlat authorizes a Side Yard reduction to 10 feet, this is a policy decision regarding development and has no impact on zoning, utilities or infrastructure.

The Commission discussed the use of TRACT E as a private park to be developed, owned and maintained by the Bradley’s Crossing POA. The Ordinance presented to the Board of Aldermen for approval on December 21st, 2015 listed this as a condition of approval for the RePlat of Bradley’s Crossing Lots 114 Thru 129 and Tracts E & F. Following discussion at that Board Meeting, the Board directed Staff to meet with the Developers, Amend the Ordinance to remove parking lot requirements, and present an agreed upon Amended Ordinance for the Second Reading of the RePlat. The Amended Ordinance is attached per the Board’s direction.

STAFF RECOMMENDATION

Staff recommends the Board of Aldermen review the RePlat Application for Bradley's Crossing Condominiums Lots 1 and 2, to Lots 114 thru 129 and Tracts E & F submitted by Sallee Real Estate Investments, LLC and consider approving the Second Reading of the Ordinance as amended.

ATTACHMENTS

- (1) RePlat Application Support Letter, Sallee Homes Inc. (Pages 5, 6 & 7)
 - (2) Final Plat of Bradley's Crossing Phase 3
 - (3) RePlat Bradley's Crossing Condominiums
 - (4) RePlat Bradley's Crossing Lots 114 Thru 129 And Tracts E & F
 - (5) District R-3 Side Yard Requirements, neighboring Cities (Pages 8, 9 & 10)
 - (6) Municipal Code, Section 400.400, A.3.c B (District R-3 Side Yard Requirement) (Pages 11 & 12)
 - (7) Development Agreement Between Sallee Real Estate Investments, LLC and the City of Peculiar
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STAFF CONTACT: Clifford McDonald
Phone: 779-2226
E-mail: cmcdonald@cityofpeculiar.com



≡≡≡ 25 YEARS ≡≡≡

December 17, 2015

Mayor and Board of Aldermen
City of Peculiar
205 S. Main Street
Peculiar, MO 64078

Re: Re-Plat Application – Bradley’s Crossing

Dear Mayor and Board:

On your agenda for Monday, December 21 is consideration of the Planning Commission’s recommendation in favor of the application to re-plat Bradley’s Crossing condominiums. This development was originally platted in 2006 and the re-plat simply reverts to that approved plan and platting so we can continue building out the development.

The re-plat is necessary because in 2008 the prior developer chose to re-plat the development from 16 individual lots (with either four-plexes or duplexes on each) to three large lots for condominium development. The condominium development never materialized, and we purchased the land for the development from the foreclosing bank in 2013.

Since we have owned the development the City has granted permits and we have constructed 4 four-plexes and one duplex on “Lot 3” of the condominium re-plat. *See* attached photograph. Those units are fully leased. The foundations for those eighteen units had been constructed years before we bought the land, and the units were built on the same lots and with the same building footprints as indicated on the 2006 original plat (even though that was technically “Lot 3” of the 2008 condominium re-plat).

The original developers put in place all of the underground utility infrastructure for the full development (e.g., gas, electric, water, storm drainage). The utilities were located based on the original individually platted lots and building footprints from the 2006 plat.

3730 NE Troon Drive Lee’s Summit, MO 64064 • 816-525-2891 • www.salleehomes.com

The only issue that arises because of the re-plat application is an intervening change in the City's side yard setback. The original 2006 plat anticipated minimum building side yard setbacks of 10 feet. In 2008, the City revised the applicable side yard setbacks to require the greater of 15 feet or the height of the adjacent building wall. Requiring the increased setback would mean re-configuring all of the lots and would be costly, both in terms of potential lost units and in expensive relocation of the utility infrastructure. If the increased side yard was required, we could potentially lose 8 units or 13 percent of the entire development. Our contractor has estimated utility relocation costs at about \$93,000. In addition, the new units would be built with different spacing than the existing units, creating an uneven look to the development. Finally, because losing 13% of our units would significantly change the economics of the project for us, it has been suggested to us that we consider developing eight-plex units (as allowed by the existing R-3 zoning district) in order to avoid losing units and to recover the costs of utility relocation.

To be clear, we do not want to change the plan that was approved in 2006 and which has been partially constructed. We appreciate the discussion and recommendation by your Planning Commission approving the re-plat so we can simply build the units on the lots and building footprints as previously approved in 2006. We hope you will agree with that recommendation. We have made great strides in this development, with both single-family homes and the attached homes, and we want to continue to benefit the neighborhood, the City of Peculiar and our family owned company.

Thank you for your service and if you have any questions before Monday's meeting, please feel free to call me.

Yours very truly,



Randy Sallee
816-699-6363 (cell)

cc: Mr. Clifford McDonald
Mr. Tyler Sallee
Mr. Greg Musil

Attachment



Sec. 6-2. - Bulk and dimensional standards table.

	A	R-1	R1A	R-1B	R-2	R-3	R-3A
Minimum lot area							
Per lot	5 ac.	8,400 sq. ft.	14,500 sq. ft.	43,560 sq. ft.	6,000 sq. ft.	7,800 sq. ft.	12,000 sq. ft.
Minimum lot width (ft.)	120	70	100	145	65	65	90
Minimum lot depth (ft.)	120	120	120	120	120	120	120
Yards, minimum (ft.)							
Front	<u>30</u>	<u>30</u>	40	50	<u>25</u>	<u>30</u>	<u>30</u>
Rear (or 20% of depth)	<u>30</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>20</u>	<u>20</u>	<u>30</u>
Side	<u>15</u>	<u>10</u>	<u>15</u>	<u>15</u>	5	5	5
Maximum building height (ft.)	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>	<u>35</u>
Maximum building coverage (%)	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>25</u>

(UDC 2010, § 10.3; Ord. No. 2011-3737, § 1, 7-26-2011)

City of Belton

Chapter 420. Use Regulations

Section 420.010 Use-Specific Standards, Residential Uses

A. Single-Family Attached and Multiple-Family Dwellings

1. **Number of Buildings per Lot**

Multiple buildings containing attached single-family and multiple-family dwellings are permitted on a single zoning lot.

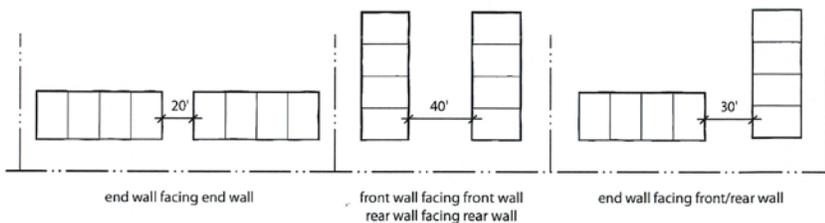
2. **Number of Units per Building**

- a. No more than eight attached single-family dwelling units are permitted within a single building.
- b. There is no limit on the number of multiple-family dwellings permitted within a single building.

3. **Minimum Separation between Buildings**

Single-family attached and multiple-family buildings situated around a courtyard will have the following minimum distance requirements as measured between exterior walls:

- a. back to back, 40 feet;
- b. front to front, 40 feet;
- c. end to end, 20 feet;
- d. end to back, 30 feet;
- e. end to front, 30 feet;
- f. no dwelling unit will face directly upon the rear of a building; and
- g. service areas and vestibules, porches, balconies and canopies not extending more than 10 feet from the building, will be excluded from the distance requirements of this section.



4. **Building Design**

Attached single-family and multiple-family dwellings must:

- a. be designed with windows and/ or doors on all building facades that face a street to avoid the appearance of blank walls; and

City of Harrisonville, MO
Monday, August 24, 2015

Chapter 405. Zoning Regulations

ARTICLE IX. "R-3" Cluster or Garden Apartment District

Section 405.185. Height and Area Regulations.

[Ord. No. 1825, 5-13-1991; Ord. No. 3107 §6, 10-19-2009]

- A. In District "R-3", the height of buildings, the minimum dimensions of lots and yards, the minimum lot area per family permitted on any lot shall be as follows:
1. *Height.* Buildings or structures shall not exceed two (2) stories in height plus a basement as defined in this Chapter.
 2. *Front yards.* No buildings shall be located closer than thirty (30) feet to a public street.
 3. *Side and rear yards.* No building shall be located closer than fifteen (15) feet to a project property line, other than a street line.
 4. *Lot area per family.* The minimum lot area shall be four thousand (4,000) square feet per family. Cluster housing may not be constructed where adequate sanitary sewers are not available for connection thereto.
 5. The building coverage shall not exceed thirty-five percent (35%).

SECTION 400.400: DISTRICT "R-3" MULTIPLE-FAMILY DWELLING

The "R-3" District is intended to provide locations for a variety of dwelling types ranging from single-family to limited multiple-family dwellings when located along a street classified as a collector or higher. The "R-3" District is also intended to serve as a transition between residential and non-residential districts. The principal use of land in this district is moderate density single-, two- and multiple-family dwellings and related recreational, religious and educational facilities.

1. *Permitted uses.* No building, structure, land or premises shall be used and no other building or structure shall be hereafter erected, constructed, reconstructed, moved or altered, except for one (1) or more of the following uses:

- a. Day care, adult.
- b. Day care, child.
- c. Retirement housing, up to twelve (12) units.
- d. Multiple-family dwelling, up to eight (8) units.
- e. Place of religious exercise or religious assembly.
- f. Preschool.
- g. Railroad rights-of-way, excluding rail yards.
- h. Single-family dwelling.
- i. Two-family dwelling.

2. *Special uses.* No building, structure, land or premises shall be used and no other building or structure shall be hereafter erected, constructed, reconstructed, moved or altered for one (1) or more of the following uses without prior approval of a special use permit in accordance with [Article V](#):

- a. Assisted living, residential care, intermediate care or skilled nursing facility, up to eighteen (18) units.
- b. Cemetery, mausoleum or columbarium.
- c. Day care center.
- d. Golf course or golf driving range, except miniature golf course.
- e. Group home.
- f. Hospital.
- g. Life care facility.
- h. Manufactured home subdivision.
- i. Public facility, use or utility.
- j. Public or private park or similar natural recreation area.
- k. Public or private school offering a curriculum that meets State standards for grades K through 12.

3. *Height and area regulations.* The height of buildings hereafter erected, constructed, reconstructed, moved or altered and the minimum dimensions of lots and yards shall be as follows, unless otherwise permitted in this code:

a. *Height.* Buildings or structures shall not exceed forty-five (45) feet or three (3) stories in height.

b. *Front yards.* There shall be a front yard of at least twenty-five (25) feet, plus three (3) feet for each story in excess of two (2).

c. *Side yards.* There shall be a side yard on each side of a building equal to the greater of fifteen (15) feet or the height of the adjacent building wall.

d. *Rear yards.* There shall be a rear yard of at least twenty-five (25) feet for buildings not exceeding two (2) stories and at least the height of the building for buildings in excess of two (2) stories.

BILL NO. 2015-30
ORDINANCE NO. _____

AN ORDINANCE OF THE BOARD OF ALDERMEN OF THE CITY OF PECULIAR, MISSOURI APPROVING THE REPLAT OF BRADLEY’S CROSSING CONDOMINIUMS LOTS 1 & 2 TO BRADLEY’S CROSSING LOTS 114 THRU 129 AND TRACTS E & F SUBMITTED BY SALLEE REAL ESTATE INVESTMENTS, LLC.

WHEREAS, Sallee Real Estate Investments, LLC has requested approval of the RePlat of Bradley’s Crossing Condominiums Lots 1 & 2 to Bradley’s Crossing Lots 114 Thru 129 and TRACTS E & F, and the Owner has met the requirements for this RePlat; and

WHEREAS, the Planning Commission held a Public Hearing on December 3, 2015, for this RePlat request and subsequent to that hearing has recommended approval of the RePlat request to the Board of Aldermen; and

WHEREAS, the Board of Aldermen held a Public Hearing on December 21, 2015 to receive public comment relative to the RePlat of Bradley’s Crossing Condominiums Lots 1 & 2 to Bradley’s Crossing Lots 114 Thru 129 and TRACTS E & F and no formal protests were received or heard.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF ALDERMEN OF THE CITY OF PECULIAR, MISSOURI AS FOLLOWS:

- Section 1.** The Development Agreement Between Sallee Real Estate Investments, LLC and the City of Peculiar, Missouri for Bradley’s Crossing Residential Area, signed the 18th day of November 2014 is in full effect and shall be incorporated into this Ordinance and made a part thereof.

- Section 2.** The RePlat of Bradley’s Crossing Condominiums Lots 1 & 2 to Bradley’s Crossing Lots 114 Thru 129 and TRACTS E & F, in the City of Peculiar submitted by Sallee Real Estate Investments, LLC is hereby approved with the stipulation outlined in Section 3.

- Section 3.** That TRACT E identified in the RePlat be developed into a private park which shall be owned and maintained by the Bradley’s Crossing Property Owners Association for use by the residents of Bradley’s Crossing. The Park shall be placed to accommodate existing drainage constraints and as a minimum shall have: a playground, two tables, two park benches and a paved access trail from the street to the Park’s amenities. The Park shall be completed before Seventy-five Percent (75%) of the Multi-family structures of Lots 114 thru 129 receive their Certificate of Occupancy.

- Section 4.** The amendment of the City of Peculiar’s Future Land Use Plan (of the City’s Comprehensive Plan) to reflect this change is hereby approved.

Effective Date. The effective date of this Ordinance shall be the _____ day of _____, 2015.

First Reading: December 19, 2015

Second Reading: _____

BE IT REMEMBERED THE PRECEDING ORDINANCE WAS ADOPTED ON ITS SECOND READING THIS ____ DAY OF _____, 2015, BY THE FOLLOWING VOTE:

Alderman Hammack _____
Alderman Ford _____
Alderman McCrea _____

Alderman Ray _____
Alderman Roberts _____
Alderman Turner _____

APPROVED:

ATTEST:

Holly Stark, Mayor

Janet Burlingame, City Clerk

City Administrator
Brad Ratliff

City Clerk
Janet Burlingame

City Engineer
Carl Brooks

Business Office
Trudy Prickett



Chief of Police
Harry Gurin

City Planner
Cliff McDonald

City Attorney
Reid Holbrook

Parks Director
Grant Purkey

Municipal Offices – 250 S. Main Street, Peculiar, MO 64078
Phone: (816)779-5212 Facsimile: (816)779-1004

To: Mayor & Board of Aldermen
From: Carl Brooks, City Engineer (cbrooks@cityofpeculiar.com)
Date: January 4, 2016
Re: Topic of discussion: Storm Water Improvements Report of a Detention Basin located southeast of the I-49 & Peculiar Way (formerly known as 211th Street) Interchange and Peculiar Way Improvements projects.

GENERAL INFORMATION

Applicant: City Staff

Requested Actions: Topic of discussion: Storm Water Improvements Report of a Detention Basin located southeast of the I-49 & Peculiar Way (formerly known as 211th Street) Interchange and Peculiar Way Improvements projects.

Purpose: Engineer to present the final report of the Storm Water Improvements Report of the Detention Basin

Property Location: Southeast of the I-49 & Peculiar Way (formerly known as 211th Street) Interchange.

PROPOSAL

See attached storm water project report from Bartlett & West

PREVIOUS ACTIONS

The City entered into an engineering agreement for the preliminary design of Storm Water Improvements located northwest of School Road and Elm Street with Bartlett & West, in an amount not to exceed \$24,914.00. The City entered into an engineering agreement for the final design, advertisement and construction phase services of Storm Water Improvements located southeast of I-49 & Peculiar Way Interchange and Peculiar Way with Bartlett & West, in an amount not to exceed \$199,000.00.

Based on the Aldermen meeting in September, City staff directed Bartlett & West to consider the design of a regional dry detention, wet retention and the conversion of a regional dry detention to a regional wet retention basin for ultimate build-out of the entire proposed CID area on the east side of the interstate, with the ultimate build-out on the west side of the interstate having to build additional storm water improvements.

Based on the Aldermen meeting in October, City staff directed Bartlett & West to complete a report considering the design of a regional dry detention, wet retention and the conversion of a regional dry detention to a regional wet retention basin for ultimate build-out of the entire proposed CID area on the east side of the interstate.

KEY ISSUES

Which type of final design, if any, to be considered as we go forward?

STAFF COMMENTS AND SUGGESTIONS

See attached project information from Bartlett & West

STAFF RECOMMENDATION

None

ATTACHMENTS

Storm Water Improvements Report of a Detention Basin by Bartlett & West

December 16, 2015

Mr. Carl Brooks, PE
Public Works Director
City of Peculiar
250 S. Main Street
Peculiar, MO 64078

Re: Detention Basin Southeast of I-49 Interchange at 211th Street

Dear Mr. Brooks,

We appreciate the opportunity to partner with the City of Peculiar to investigate the potential detention basin on Mr. Dean's property. Attached with this letter is the report summarizing the options that we have developed.

We studied three alternatives that have merit for the City to consider moving forward. A dry basin is the lowest cost solution and is estimated to cost \$1.71 million. A wet basin is a more expensive option at roughly \$3.25 million, but the wet basin provides the aesthetics of a lake and the potential for other recreational uses. An intermediate option is to construct a dry basin now and convert it to a wet basin in the future, but this increases the construction cost. Each of these options is summarized in the report along with the methodology used in our study.

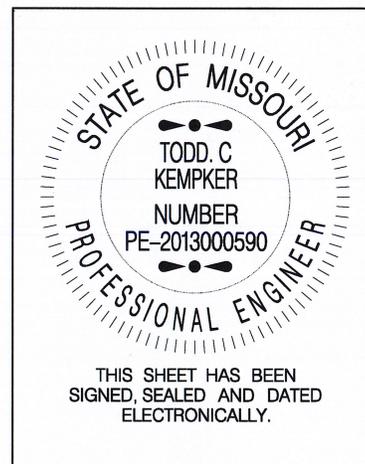
We look forward to working with you in the future on this project and others. Please let us know if you have any questions or comments regarding this report.

Sincerely,



Todd Kempker, P.E.

Attachment



Sealed 12/16/2015

Bartlett & West, Inc.

Certificate of Authority No. 000167 (Engineering)

EXECUTIVE SUMMARY

The City of Peculiar commissioned a study and this report to investigate potential options for a detention basin southeast of the I-49 interchange at 211th Street, which is currently being constructed. The purpose of this detention basin is to reduce flooding hazards in the neighborhood downstream of School Road. This is an area that has experienced significant flooding in the past, and the detention basin is a viable solution to the flooding problems.

The existing hydrology was investigated at the southern end of Mr. Dean's property. The existing peak runoff at this location was found to range from 1040 cfs in a 2-year event to 3320 cfs in a 100-year storm. A hydraulic model downstream of the potential detention location was developed using surveyed information and the calculated peak runoffs for various storm events. This model confirmed that residences would likely experience flooding in a 2-year event, and up to eighteen structures would have the potential of flooding in the 100-year event. The hydraulic model also determined that a 700 cfs flow would be a reasonable target value for the basin's peak discharge in a 100-year event.

Three potential solutions were developed as part of the conceptual study. The first option is to construct a dry detention basin, which is estimated to cost \$1,710,000. A second option is to construct a wet detention basin that retains a permanent pool of water. This option increases the cost to \$3,250,000, and the permanent pool is estimated to cover approximately 22 acres. An intermediate option would be to construct the basin as a dry detention basin with the intentions of converting it to a wet detention basin in the future. In this scenario, the initial cost of the dry basin increases to \$2,010,000, and the total cost after converting to a wet basin would be \$4,340,000 after the construction of both phases.

A geotechnical investigation was conducted to determine the soil composition. It was determined that fat clay existed on site that could be used as the lining of a wet detention basin and the clay core of the dam. It was also determined that rock elevations were deep enough that grading could occur without requiring any excavation of shale or limestone. This subsurface information was utilized when developing the grading plans for each of the options.

The study also included preliminary coordination with the U.S. Army Corps of Engineers to obtain their concerns on the project. During this coordination, it was determined that permitting would be much easier for the dry detention option. A wet detention basin would require an Individual Permit. If a wet basin is desired by the City, it is also possible that the Corps of Engineers would require an alternatives analysis that investigates options of their choosing. Finally, the Corps stated that mitigation would be required to offset stream impacts of a wet basin. It was suggested that mitigation costs could approximate \$350,000, which does not include the additional engineering costs that will be required.

Each of the options investigated during this study would significantly reduce the flooding potential downstream and perform similarly from a hydraulic standpoint. The main differentiator between the options is whether the City desires the aesthetic and recreational benefits of a wet basin. These benefits do come with significant cost increases, either initially or in a future scenario when the basin is converted to maintain a permanent pool.

It is recommended that if a wet detention basin is chosen, coordination with the Corps of Engineers should proceed early in the basin's design to obtain both approval from the Corps as well as refine the mitigation costs for the City's planning purposes.

INTRODUCTION AND PROJECT BACKGROUND

The City of Peculiar commissioned Bartlett & West to study options for a detention basin west of School Road and southeast of the Interstate 49 interchange with 211th Street currently under construction. The residences downstream of this location experience flooding during large rain events. A citywide stormwater master plan, circa 2006, recommended an approximately 15 acre detention basin to address the flooding concerns downstream.

With the new interchange construction taking place and providing additional development potential in the vicinity, the City wanted to further investigate the detention options at this location. A Community Improvement District (CID) is being formed in the area around the interchange to facilitate development. Property owners in the undeveloped area were given the opportunity to opt in or out of the CID. These limits were taken into account in the design of the detention basin to provide a basin large enough to handle any detention needs east of the interstate for future development within the CID, and these limits can be seen in Appendix B.

The purpose of this report is to develop options for the detention basin and the approximate limits and costs of each option. Three options are investigated as part of this study – a dry basin, a wet basin and an option that is initially constructed as a dry basin but has the ability to be converted to a wet basin in the future. This report will provide the City a budgetary number that can be used for future planning and assist in negotiations with property owners on development potential and land acquisition.



Figure 1: Project Location Map

DESIGN CRITERIA AND METHODOLOGY

The design and calculations for the study followed the Kansas City Metropolitan Chapter of the American Public Works Association Section 5600, which is the standard criteria for municipalities in the region. Specifically, design criteria for the basin characteristics were according to APWA 5608 “Stormwater Detention and Retention”. The key points from this criteria include:

- Basin volume is based upon the 1% probability (100-year), 24-hour rainfall event
- Emergency spillway shall be set at least 6” above the 100-year pool elevation
- Emergency spillway shall be designed for the full 100-year peak flow rate
- Top of dam will be set at least 1’ above the design flow through the emergency spillway
- One-quarter of the wet basin area shall have a depth of at least 10’
- The wet basin shall provide a valve to drain the basin in 72 hours or less

The hydrology calculations were completed utilizing HEC-HMS Version 3.5 developed by the U.S. Army Corps of Engineers. The calculations within the program were performed based on the National Resources Conservation Service’s Technical Report 55 (TR-55) and its curve number methodology. Appendix A displays the hydrologic soil groups taken from the University of Missouri’s Center for Agricultural, Resource and Environmental Systems and used with the tables from TR-55 to obtain a curve number. A SCS Type II Rainfall Distribution was then utilized with the rainfall depths recommended in TR-55. Times of concentration were also calculated according to TR-55, and the routing between the subbasins was performed via the Muskingum-Cunge method and based on publically available digital elevation models.

The calculations for sizing the basin and outfall structure were completed with a combination of spreadsheet calculations and HEC-HMS. The outfall structure was assumed to be a rectangular shape with an open top. At low flows this was assumed to act as a sharp crested weir. The controlling condition of orifice flow through the rectangular opening was also calculated at 1’ increments. The weir flow and orifice flow values were then compared and a lower value for each elevation was chosen since the flow regime of an outfall structure switches from weir flow to orifice flow at the higher elevations. The vertical riser was then designed to flow into a reinforced concrete box culvert. This box culvert was sized based on inlet control nomographs to provide larger flows than those calculated from the riser structure to avoid constricting the basin’s discharge flow within the box culvert. For the dry basin options that do not include a vertical riser, the discharge rates were determined from the inlet control nomograph. This information was compiled in a discharge elevation curve. A storage elevation curve was also developed from the proposed grading plans for each option. The two curves were utilized within HEC-HMS in order to perform the detention basin routing calculations.

HYDROLOGY

The watershed of the proposed detention basin has four distinct subbasins given the topography, existing improvements such as roadways and associated storm culverts under those roadways, and land use characteristics. The existing conditions summarized in this report are the conditions associated with the current land use with no other development around the interchange. The future conditions summarized in this section and throughout this report describe a future development condition based on the latest Future Land Use Map provided by the City and include development only in the CID limits and only for the portion of those limits east of I-49. As decided by the City of Peculiar, these limits are

the basis of the future conditions scenario to which all 3 detention options were sized. By only including the CID limits for any future development considered in this study, it is understood by the City that future developments outside of the CID limits will be required to detain stormwater runoff to pre-development conditions on their own properties. Refer to Appendix B for an exhibit showing the overall watershed, the subbasins, the future land uses from the most recent City planning map and limits of the CID.

ENTIRE WATERSHED CHARACTERISTICS

Area: 1.65 mi²

Average Overall Slope: 1.2%

Development Conditions:

Existing: 65% undeveloped/35% developed

Future: 55% undeveloped/45% developed (includes developed areas in CID limits east of I-49)

SUBBASIN CHARACTERISTICS

Subbasin	Drainage Area (mi ²)	Existing Composite CN	Future Composite CN	Lag Time (min)
1	0.51	78.64	81.39	29.59
2	0.31	75.52	81.86	28.59
3	0.56	81.54	81.54	35.91
4	0.27	93.79	95.41	22.71

Table 1: Subbasin Characteristics

EXISTING & PROPOSED CONDITIONS PEAK RUNOFF RESULTS

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)
2	1039.7	1147.7
5	1613.3	1738.4
10	2048.0	2177.5
25	2485.8	2615.5
50	2875.8	3005.0
100	3316.6	3449.2

* Results based on future developed conditions within CID

Table 2: Hydrology Results for Existing and Proposed Conditions

HYDRAULICS AND FLOODING ANALYSIS

The intent of the project is to alleviate the flooding issues that occur in the neighborhood downstream of School Road. According to reports from City officials, flooding occurs in frequent significant rain events and includes the water reaching multiple residences. This is not a recent development and has been something that the property owners have had concerns with for many years. According to the Federal Emergency Management Agency’s (FEMA) Flood Insurance Map, eighteen structures are within

the 100-year floodplain. It should be noted that this is a Zone A floodplain and has not been part of a detailed study by FEMA.

During Bartlett & West's study, a detailed analysis was performed to verify the flooding issues and develop a target flow for the detention basin's peak outfall. This study included the field survey of cross-sections throughout the neighborhood as well as obtaining flow lines and culvert sizes for the crossings between School Road and Harr Grove Road. This information was then input into HEC-RAS Version 4.1 to develop a hydraulic model. The model included box culvert crossings at School Road, Glengera Street and Harr Grove Road, as well as low-water crossings at 1st Street and Hurley Street. During the survey, low opening elevations and adjacent grade elevations were obtained on the houses that bordered the channel.

The existing hydrology presented in Table 1 above was input into the hydraulic model to assess the current flooding scenario. The hydraulic model produced a 100-year floodplain that coincided well with the floodplain shown on the FEMA map, and verified that eighteen structures along the channel would have a high probability of flooding during an event of this magnitude as shown in Appendix C. The hydraulic model also showed that a 2-year event was large enough to create flooding issues at many of these homes.

The hydraulic model was then studied to determine a flow value that the channel could accept without having water above the low opening elevation of any of the residences, which was determined to be 700 cfs. The limits of a 700 cfs peak runoff event are shown on Appendix C along with the 100-year existing floodplain from the Bartlett & West model. It should be noted that the 700 cfs peak runoff does not achieve one foot of freeboard to several residences. While this factor of safety is often desired when analyzing flooding, it was impractical to obtain flow rates low enough to provide this level of service throughout the neighborhood. It should also be noted that one out-building is within the floodplain of this target event. However, the target 700 cfs peak runoff would have a significant impact on reducing flooding in the neighborhood and is 21.1% of the existing 100-year flood. Therefore, it was chosen as the target value for the peak discharge from a proposed detention basin in the 100-year event.

COORDINATION

During the study, Bartlett & West and the City coordinated with both the current property owner of the detention basin's site and the United States Army Corps of Engineers to obtain their concerns on the project. It was understood that these entities would be critical for the project's success and should be included early-on in the decision-making process. The following section summarizes the discussions with each party.

Property Owner – Mr. Dean

The City coordinated with Mr. Gary Dean prior to commencing the study. It was understood going into the study that Mr. Dean was considering donating the land for the detention basin to the City. In return for his donation, the City would construct the basin and would not require any future stormwater detention from Mr. Dean or future owners on this property.

During the project, a meeting was held that included Mr. Dean, the City and Bartlett & West and concluded with several follow-up conversations between the City and the property owner. Mr. Dean, his attorney and his third-party engineer were provided the conceptual drawings of the detention basin

along with the calculations. During this process, Mr. Dean gave approval to the City on the limits of the basin and his willingness to donate the property. At the time of the study, Mr. Dean did not have a preference on whether it was a wet or dry detention basin and was willing to donate the land for either option.

While the approximate limits of the detention basin were shared, proposed property lines have not been developed or shared with Mr. Dean at the time of this report. It was requested by Mr. Dean and his representatives that any property lines developed would be larger than the strict limits of the basin and would include any property that he deemed to be undevelopable due to the basin's construction.

United States Army Corps of Engineers

In the early stages of the study, the City was considering the option of moving ahead with the construction of a wet detention basin. To further explore that potential, a Section 404 permit was submitted to the Corps of Engineers. Subsequent to the Corps receiving the permit, a meeting was held with the City, Bartlett & West and Ms. Kailey Jones, the representative for the Corps of Engineers. During this meeting, Ms. Jones expressed concern with the ability for the Corps to permit the wet basin. The concern was that the purpose of the project, as listed on the permit application, was for flood control. She stated that the Corps of Engineers is only allowed to permit the least environmentally impactful, practical alternative. Her concern was that a dry detention basin would have less of an impact to the existing stream and provide similar flood control. She suggested that the project's purpose would likely need to be modified to include reasons that the City is desiring a wet detention basin. These reasons could include public safety for the downstream residents, aesthetic enhancements to the area, recreational purposes (which could include a trail around the lake) and/or economic development. The Corps of Engineers also suggested that an alternatives analysis would likely be required to prove that this is the appropriate option. It is very possible that the Corps will desire alternatives to be investigated beyond those that the City has requested and that are represented in this report.

It was also noted by the Corps of Engineers that mitigation would be required for a wet detention basin option. The Corps of Engineers allows for a stream impact of three hundred linear feet or less in their Nationwide permits. When impacting a longer length of stream, an individual permit is required. The stream will be considered to be impacted by grading, filling or if it is impounded by water for a lengthy period of time. If a dry detention basin is utilized, the length of the stream impact could be limited to roughly the width of the dam, which could be within the three hundred foot limit. However, for a wet detention basin the stream impact at this site will be far greater than the three hundred foot limit. In this case, a mitigation plan will be required. It was suggested that if the mitigation is achieved by payment and not by some other method, the price could be in the range of \$350,000. It is expected that some of the stream impacts could be offset by stream credits in the watershed, but the repairs to obtain those credits will also require costs, and it is unlikely that the full amount of stream credits can be obtained in this manner.

PROPOSED OPTIONS

After discussions between Bartlett & West and the City of Peculiar during the initial study phase of the project, Bartlett & West was tasked with investigating three options for the detention basin: a dry basin, a wet basin and an option that is initially constructed as a dry basin but has the ability to be converted to a wet basin in the future. In order to determine the feasibility of constructing the berm using in-situ fat

clay material for each of the three options, Bartlett & West subcontracted with Terracon to complete nine geotechnical soil borings. Refer to Appendix D for a map of the boring locations and Appendix E for the boring logs from that field investigation.

This data was used to create surfaces of these soil strata in order to determine whether the limits and depths of excavation for each of the three options generated enough fat clay for the core of the dam construction as required by Terracon. By ensuring enough fat clay was excavated, contractor provided fill material was completely eliminated for each of the three options. After initial grading design was completed, elevation-volume data was compiled for use in HEC-HMS. Similarly, elevation-discharge data was calculated for the overflow structure configuration for each of the three options. This data along with the hydrology inputs from the previous section above produced peak outflow and elevation information.

OPTION 1: DRY BASIN (APPROXIMATE PROJECT COSTS - \$1,710,000)

The first option consists of the construction of a dry detention basin. The grading associated with this option consists of grading outside of a one hundred foot wide stream buffer by cutting into the existing grade while maintaining a positive slope back towards the stream to allow for complete drainage of the dry basin and to obtain additional storage volume. The limits of the excavation on either side of the stream are based on excavating enough material to construct the dam. For this study it was assumed that a clay core would not be provided in this option and additional fat clay excavation was not sought out. The total volume of excavation for this option is 78,560 CY.

One benefit of this option is given the relatively quick drain-down time of the dry basin, the existing sewer line would not have to be relocated out of the basin limits and bolt-down manhole lids could simply be installed on all manholes that are inundated during a storm event. However, it is recommended that the sanitary sewer directly under the dam be replaced with ductile iron to handle the increased load.

The dry basin high water elevation during the SCS Type II Rainfall 100-year storm event is 963.0. Based on the requirements of APWA 5608, the spillway elevation is 963.5 and the top of dam elevation is at 968.5. The overflow structure for this option consists of a 7' X 6' RCB 144 feet in length. See Appendix H for an exhibit of the preliminary grading and outflow structure and Appendix I for the cost estimate breakdown. The results of the HEC-HMS model for this option are as follows:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	432.8	957.2
5	1613.3	1738.4	483.8	959.0
10	2048.0	2177.5	508.7	960.2
25	2485.8	2615.5	537.7	961.2
50	2875.8	3005.0	560.4	962.1
100	3316.6	3449.2	567.5	963.0

* Results based on future developed conditions within CID.

Table 3: Hydrology Results for Dry Detention Basin Option

OPTION 2: WET BASIN (APPROXIMATE PROJECT COSTS - \$3,250,000)

The second option consists of the construction of a wet detention basin that would detain stormwater addressing downstream flooding issues and allow for an approximate 22 acre lake that would serve as an amenity for the surrounding development. The grading associated with this option consists of grading from the banks of the stream throughout the limits of the basin at a depth that will still allow for a 2' clay liner to remain after excavation. The limits of the excavation are based on excavating enough fat clay material to satisfy the construction of the dam core. The total volume of excavation for this option is 125,450 CY. Due to the continuous pool depth with the wet basin option, the existing sanitary sewer must be relocated for those portions within the wet basin footprint.

The wet basin high water elevation during the SCS Type II Rainfall 100 year storm event is 965.1. The spillway elevation is 965.6 and the top of dam elevation is at 970.6. The overflow structure for this option consists of a 7' X 8' RCB 140 feet in length, with a 7' X 7' riser structure with weir elevation of 957.5. A 36" pipe would also be provided to drain the lake on an as needed basis. Appendix H shows the conceptual design of this option, and a detailed cost estimate can be found in Appendix I. The results of the HEC-HMS model for this option is as follows:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	363.4	960.4
5	1613.3	1738.4	477.2	961.6
10	2048.0	2177.5	529.7	962.7
25	2485.8	2615.5	576.4	963.5
50	2875.8	3005.0	613.0	964.3
100	3316.6	3449.2	650.1	965.1

* Results based on future developed conditions within CID.

Table 4: Hydrology Results for Wet Detention Basin Option

OPTION 3: DRY BASIN WITH OPTION TO UPGRADE TO WET BASIN (APPROXIMATE PROJECT COSTS - \$4,340,000)

PHASE 1: DRY BASIN (APPROXIMATE PROJECT COSTS - \$2,010,000)

Because the initial cost of the wet basin is likely outside the City's budget, a third option was developed that allowed a dry basin to be constructed initially and modified at a later date to convert it to a wet basin. The first phase consists of the construction of a dry detention basin that has the dam required for the wet basin option. The grading associated with this option is similar to Option 1 in that it consists of grading from outside the stream buffer by cutting into the existing grade while maintaining a positive slope back towards the stream to allow for complete drainage of the dry basin. The difference between Phase 1 of Option 3 and Option 1 is that the limits of grading are slightly greater in order to excavate enough fat clay material for the construction of the dam with a height appropriate for the Phase 2 wet basin transition as well as providing the clay core. The total volume of excavation for this option is 97,400 CY. As in Option 1, a full sanitary sewer relocation is not needed.

The high water elevation during the SCS Type II Rainfall 100 year storm event after the first phase of construction for Option 3 is 963.1. Based on the requirements for the wet dam height, the spillway elevation is 965.2 and the top of dam elevation is at 970.2. The overflow structure for this option

consists of a 7' X 9' RCB 154 feet in length with a 3' concrete flow restricting headwall. This headwall allows for the appropriate discharge rates in the dry scenario while still providing a box culvert size that does not restrict flow after Phase 2's construction. The preliminary layouts and cost estimates can be found in the appendices. The results of the HEC-HMS model for this option is as follows:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	434.9	957.3
5	1613.3	1738.4	486.5	959.2
10	2048.0	2177.5	512.1	960.3
25	2485.8	2615.5	540.6	961.3
50	2875.8	3005.0	561.0	962.1
100	3316.6	3449.2	568.9	963.1

* Results based on future developed conditions within CID.

Table 5: Hydrology Results for the Dry Phase of Option 3

PHASE 2: WET BASIN (APPROXIMATE PROJECT COSTS - \$2,330,000)

The second phase consists of the construction of a wet detention basin by further excavating to achieve an appropriate normal pool depth. This additional excavation will produce a lake very similar to Option 2 with a permanent pool of approximately 22 acres. The grading of the basin's pool will ensure that a two foot fat clay liner is maintained. Since the Phase 1 portion of construction excavated enough fat clay material for the construction of the dam, the excavation during Phase 2 is only required to create a ten foot deep pool over a quarter of the lake's area to satisfy the requirements of APWA 5608. The total volume of excavation for this option is 102,205 CY. Because the dam is included in the Phase 1 construction, very little fill would be required during this phase. It is anticipated that this material could be placed on Mr. Dean's property to assist him in leveling off areas for development. During this phase, the existing sanitary sewer that is within the footprint of the wet basin must also be relocated.

The wet basin high water elevation during the SCS Type II Rainfall 100 year storm event is 964.7. The spillway elevation is 965.2 and the top of dam elevation is at 970.2. For this option the 7' X 9' box culvert installed in Phase 1 would be modified to remove the wings and accept a vertical riser structure. A 7' X 7' vertical riser would then be installed in front of the box culvert. This structure would be very similar to the one proposed in Option 2 and would have a weir elevation of 957.5. As in Option 2, the design would also include a pipe to drain the lake.

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	358.1	960.3
5	1613.3	1738.4	469.8	961.5
10	2048.0	2177.5	519.3	962.4
25	2485.8	2615.5	563.7	963.2
50	2875.8	3005.0	599.2	964.0
100	3316.6	3449.2	634.3	964.7

* Results based on future developed conditions within CID.

Table 6: Hydrology Results for the Wet Phase of Option 3

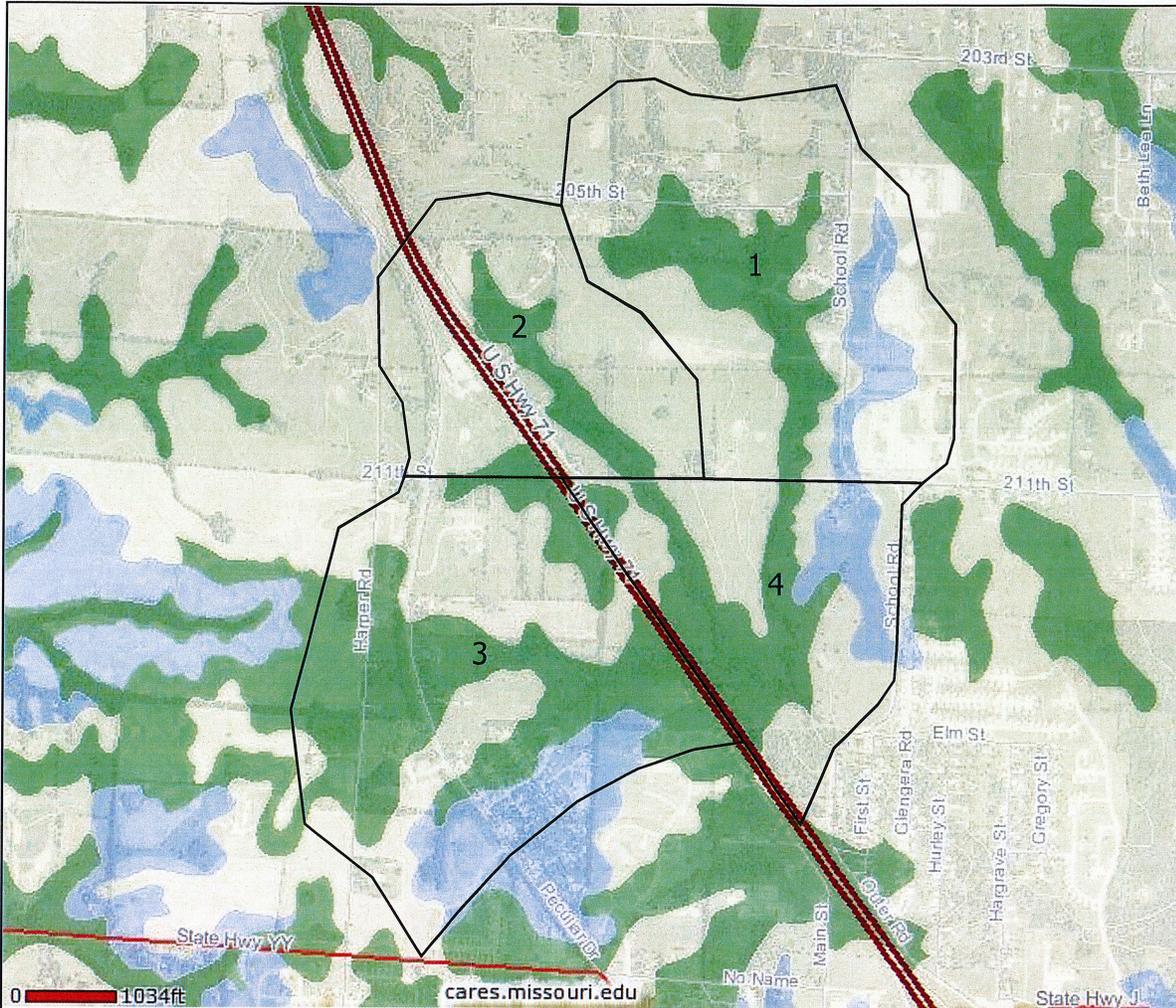
SUMMARY AND RECOMMENDATIONS

Three detention basin options were sized to handle future development within the portion of the Community Improvement District that is east of Interstate 49. The options include both a wet and dry basin as well as an option that can be constructed as the dry basin initially and converted to a wet basin later. Each option functions on a very similar level hydraulically, so there is no clear engineering reason to choose an option. The low cost solution is to construct a dry basin at \$1.71 million. A wet basin increases the cost approximately \$1.54 million, but may be desired by the City due to the aesthetics and recreational opportunities. An intermediate option is to construct the phased approach option. However, this option is expected to have an initial cost \$300,000 greater than the dry basin and long term project costs \$1.09 million above the initial wet basin option, which could make the long term viability of this option cost prohibitive. These numbers are 2015 costs without inflation included, which should be taken into account in future budgeting.

It should be noted that the U.S. Army Corps of Engineers will likely expect additional alternatives to be evaluated if a wet basin is chosen. While coordinating with the Corps during this study, it was stated that they would need an alternatives memorandum that investigated additional options and was able to show why a wet basin is the best option for this location. If the wet basin is chosen by the City, it is recommended that the next step include detailed coordination with the Corps of Engineers, and would likely include more alternatives to be studied and detailed mitigation options that could be pursued. The goal of this coordination would be a memorandum of understanding or other form of preliminary approval for the City's chosen option and also defining what the mitigation needs would be if the City continued with this project in the future.

APPENDIX A
HYDROLOGIC SOIL GROUPS

Peculiar HSG



Legend

ZOOM TO VIEW:

MoDOT Roads and Highways, 2007

- Interstate
- U.S. Highway
- State Numbered Highway
- State Lettered Highway
- Principal Road
- Road or Street
- Private Road or Drive

Hydrologic Soil Groups (Dom. Condition)

- A (High Infiltration / Low Runoff Potential) (cont)

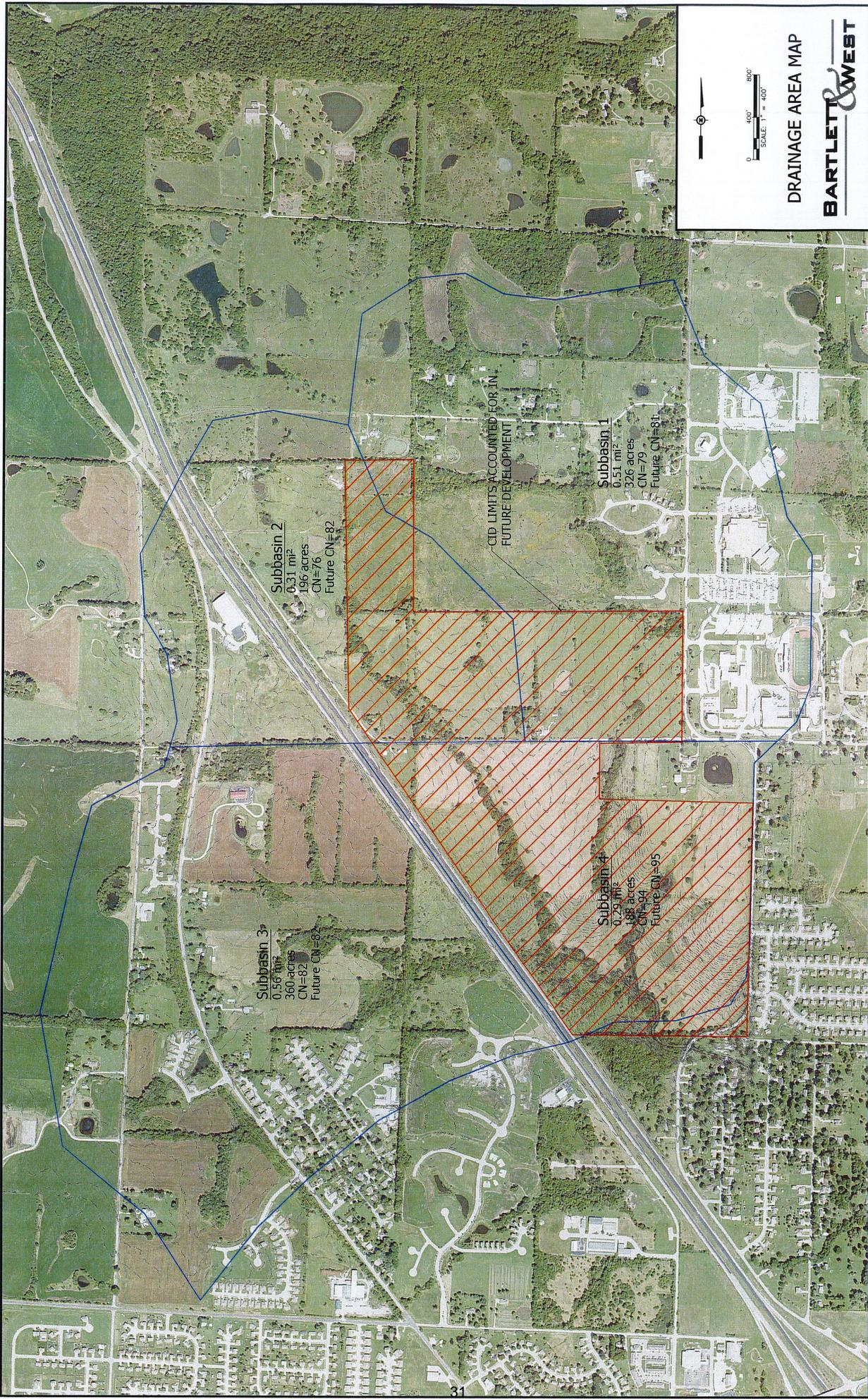
- B
- B/D
- C
- C/D
- D (Low Infiltration / High Runoff Potential)
- Not Rated

2010 Aerial Photos (NAIP)
2010 Aerial Photos (NAIP)

Locator Map



APPENDIX B
SUBBASIN EXHIBITS



CID LIMITS ACCOUNTED FOR IN FUTURE DEVELOPMENT

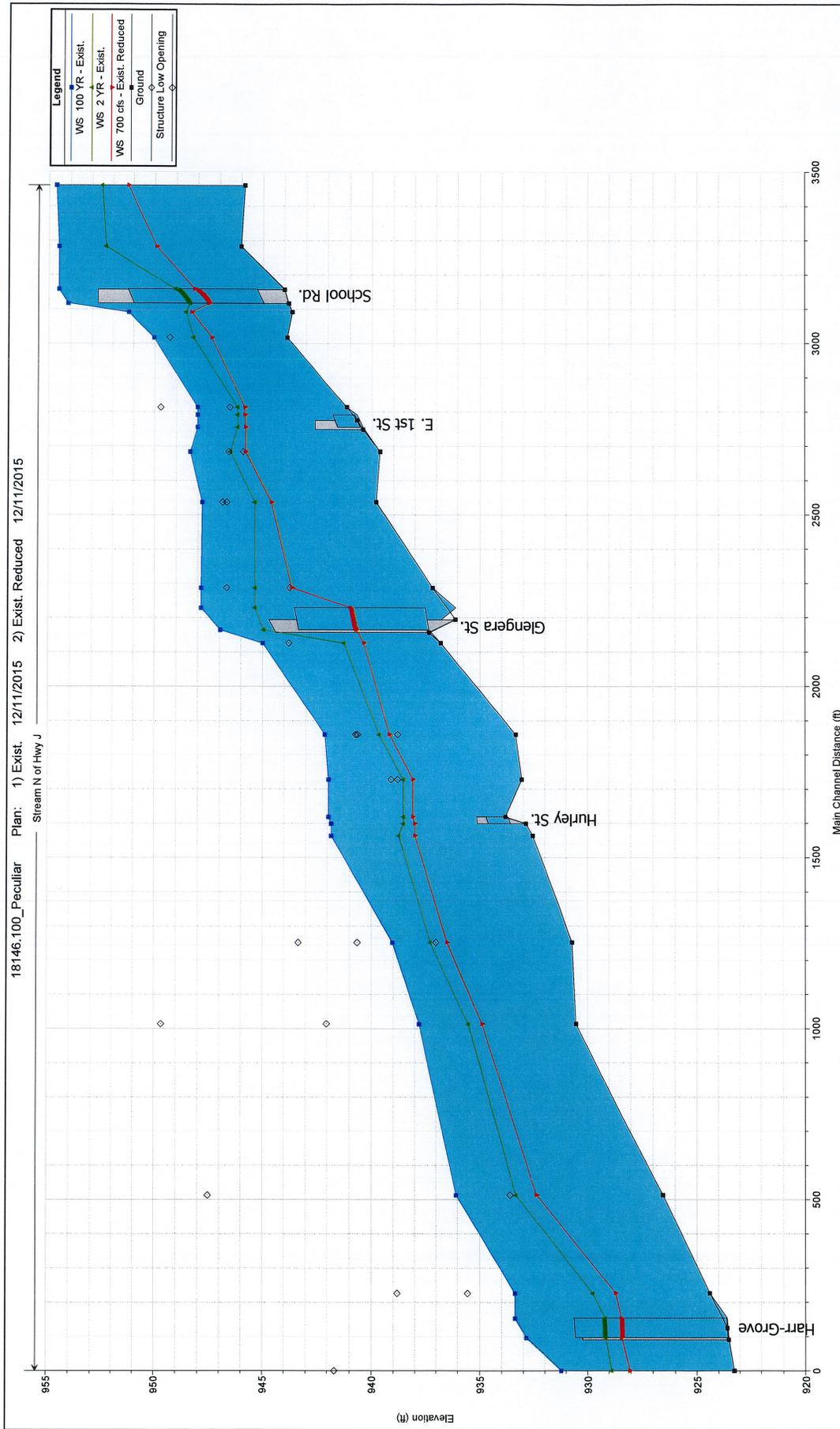
Subbasin 2
 0.31 mi²
 196 acres
 CN=76
 Future CN=82

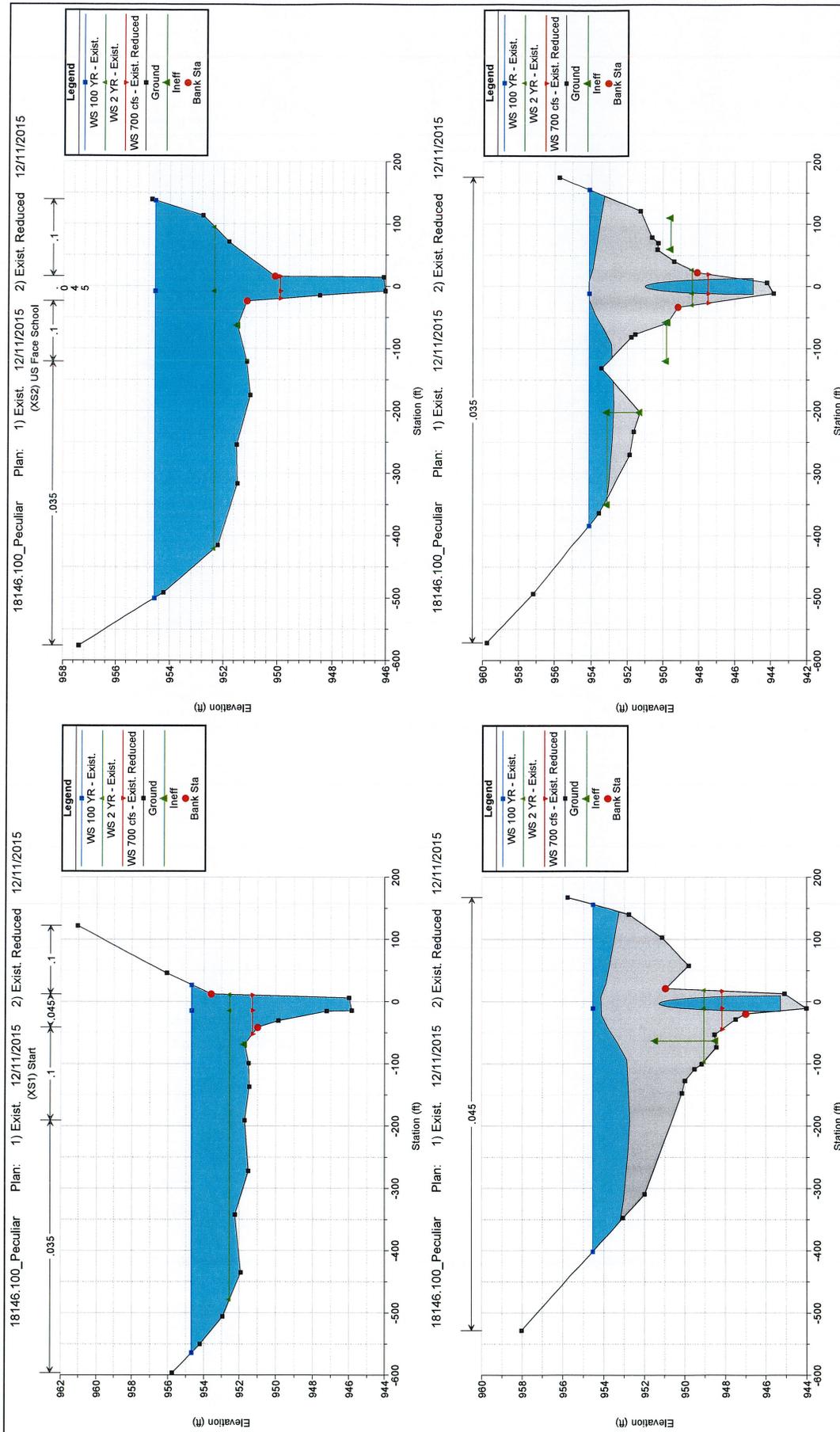
Subbasin 1
 0.51 mi²
 326 acres
 CN=79
 Future CN=81

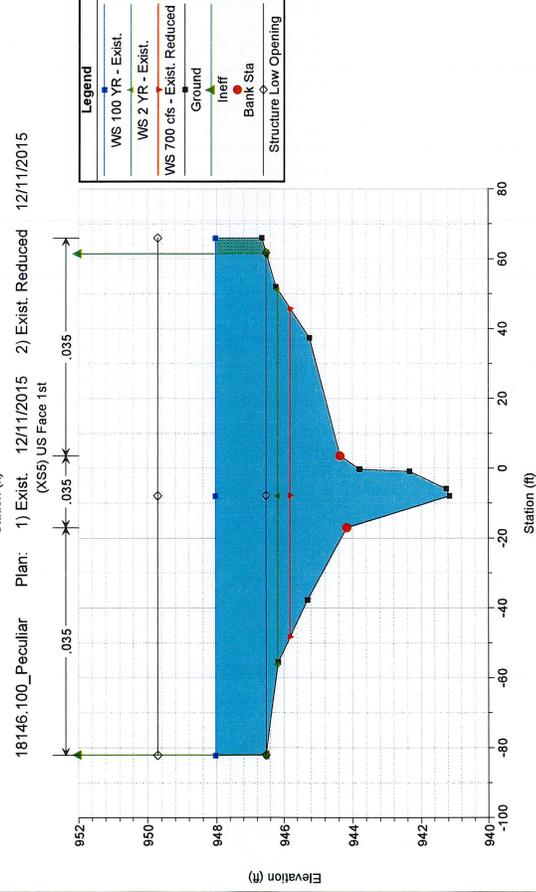
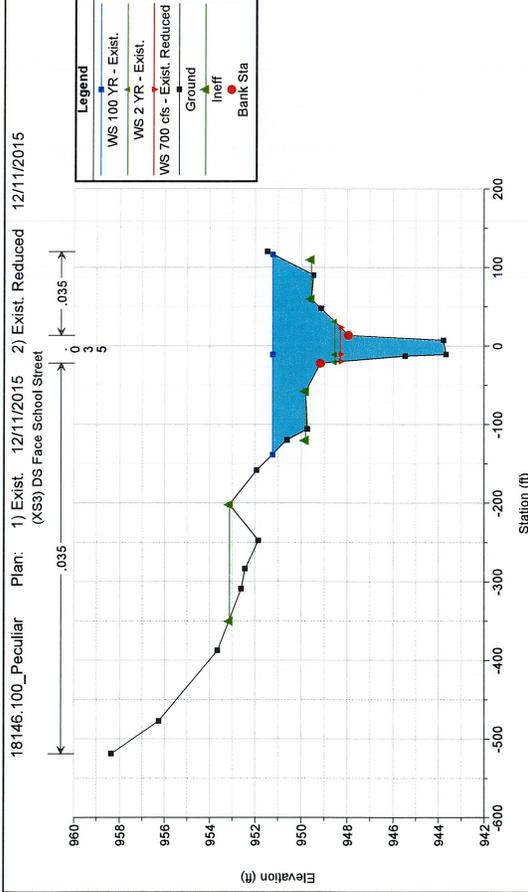
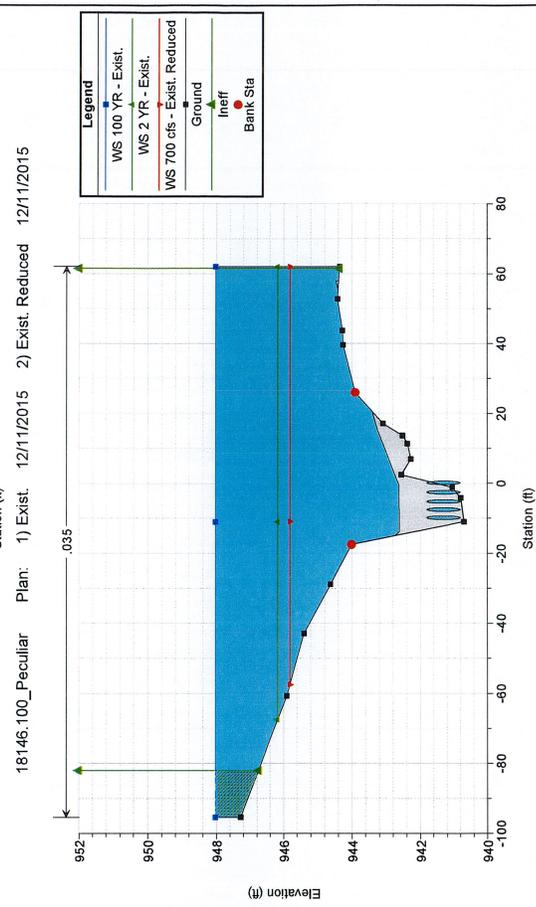
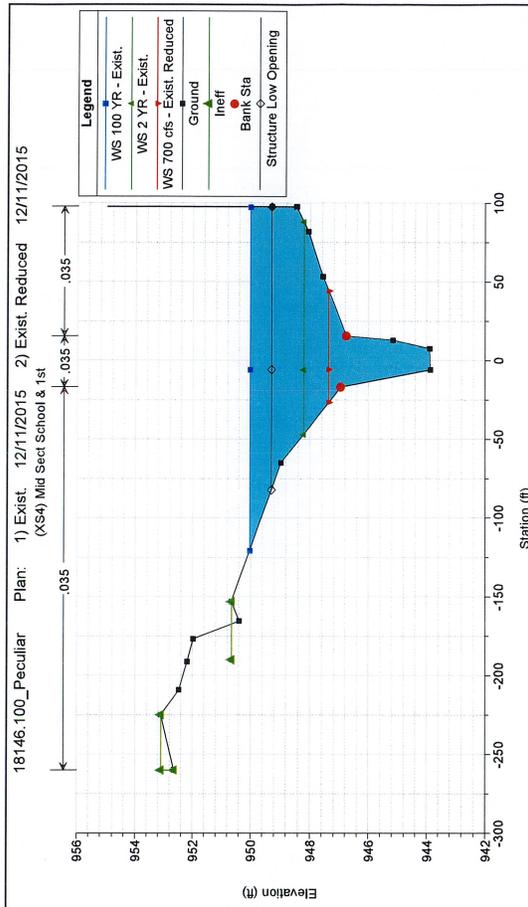
Subbasin 3
 0.56 mi²
 360 acres
 CN=82
 Future CN=82

Subbasin 4
 0.29 mi²
 188 acres
 CN=94
 Future CN=95

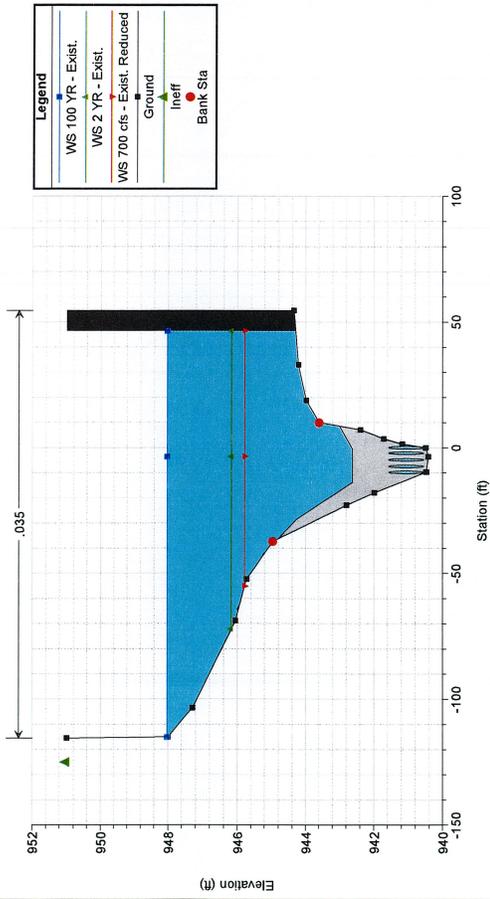
APPENDIX C
HYDRAULIC RESULTS



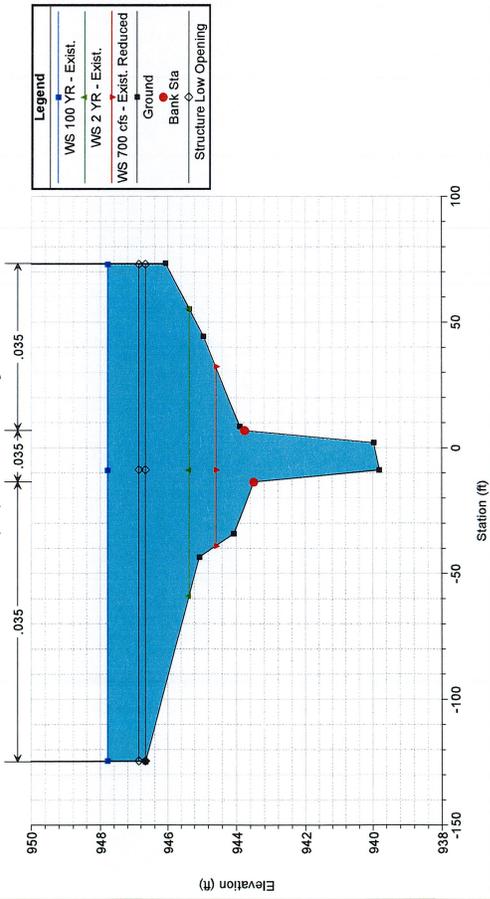




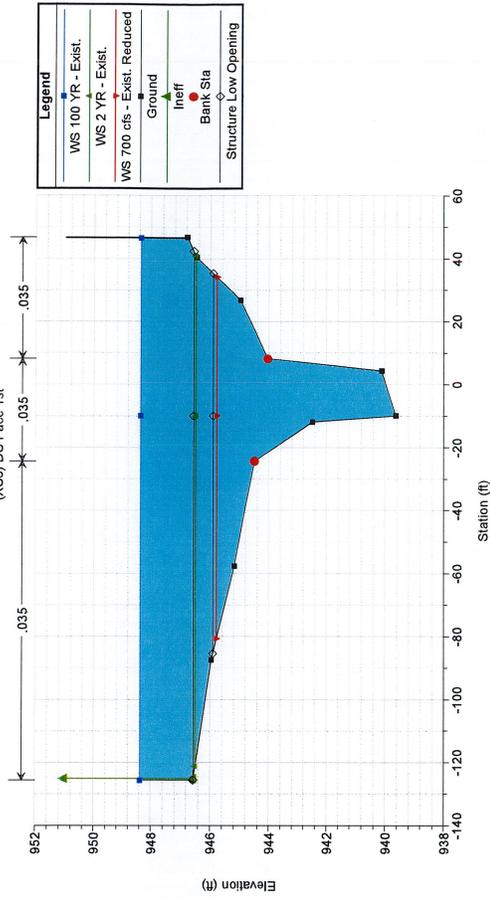
18146.100_Peculiar Plan: 1) Exist. 12/11/2015 2) Exist. Reduced 12/11/2015



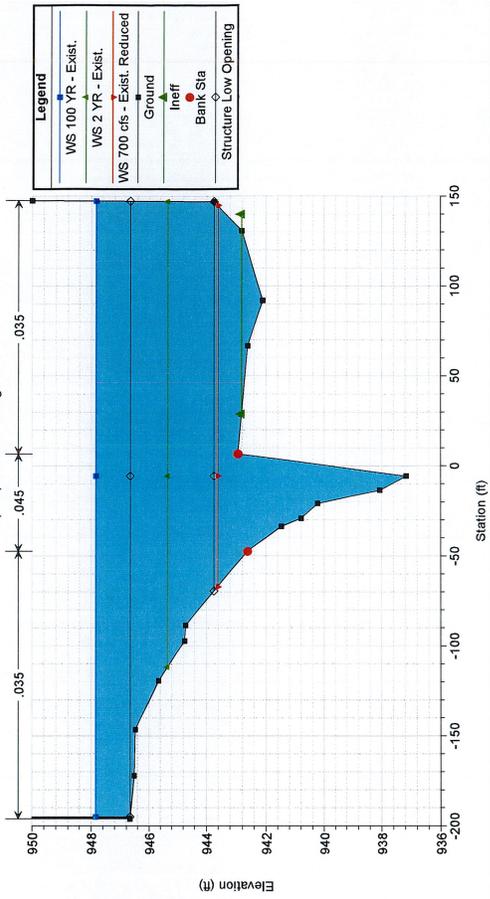
18146.100_Peculiar Plan: 1) Exist. 12/11/2015 2) Exist. Reduced 12/11/2015



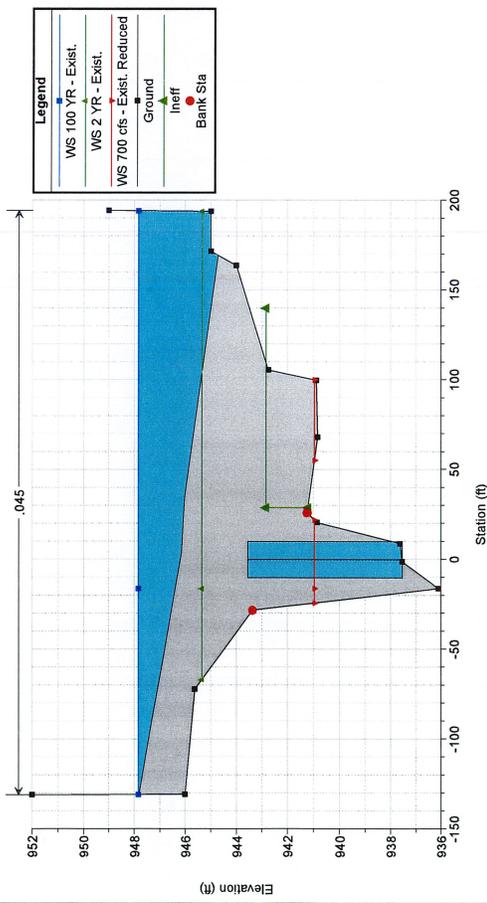
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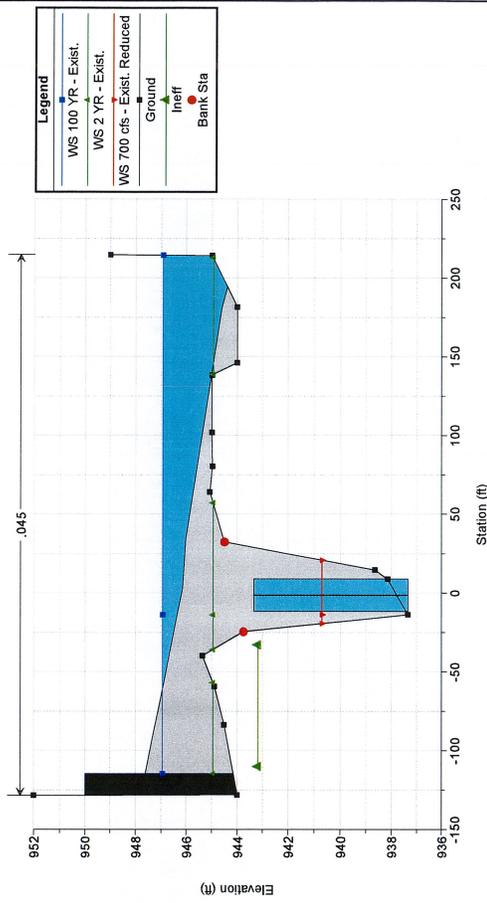
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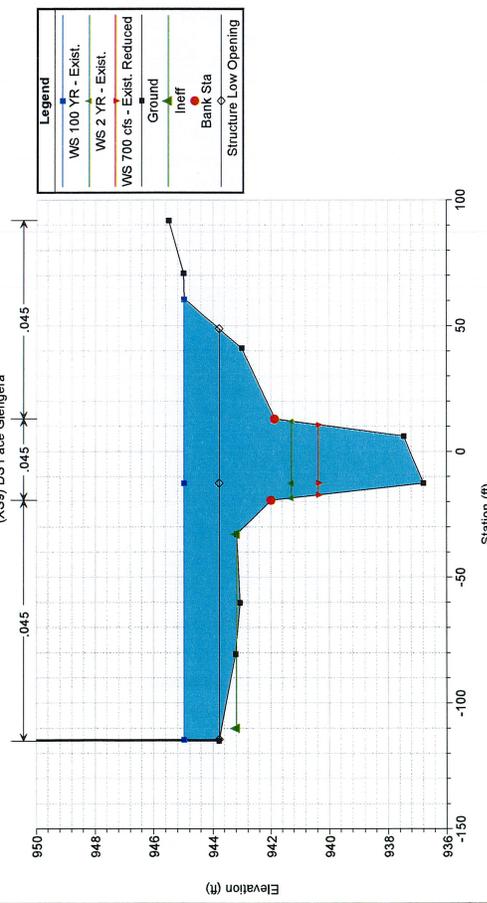
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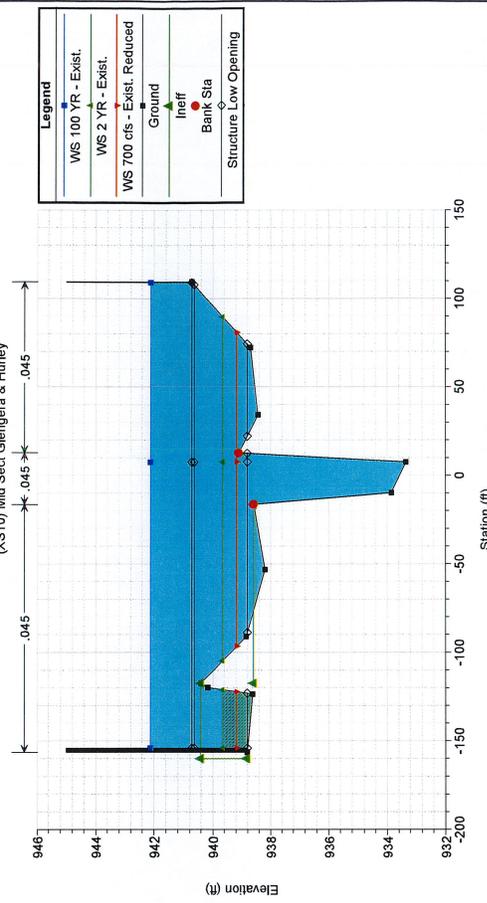
18146.100_Peculiar Plan: 1) Exist. 12/11/2015 2) Exist. Reduced 12/11/2015

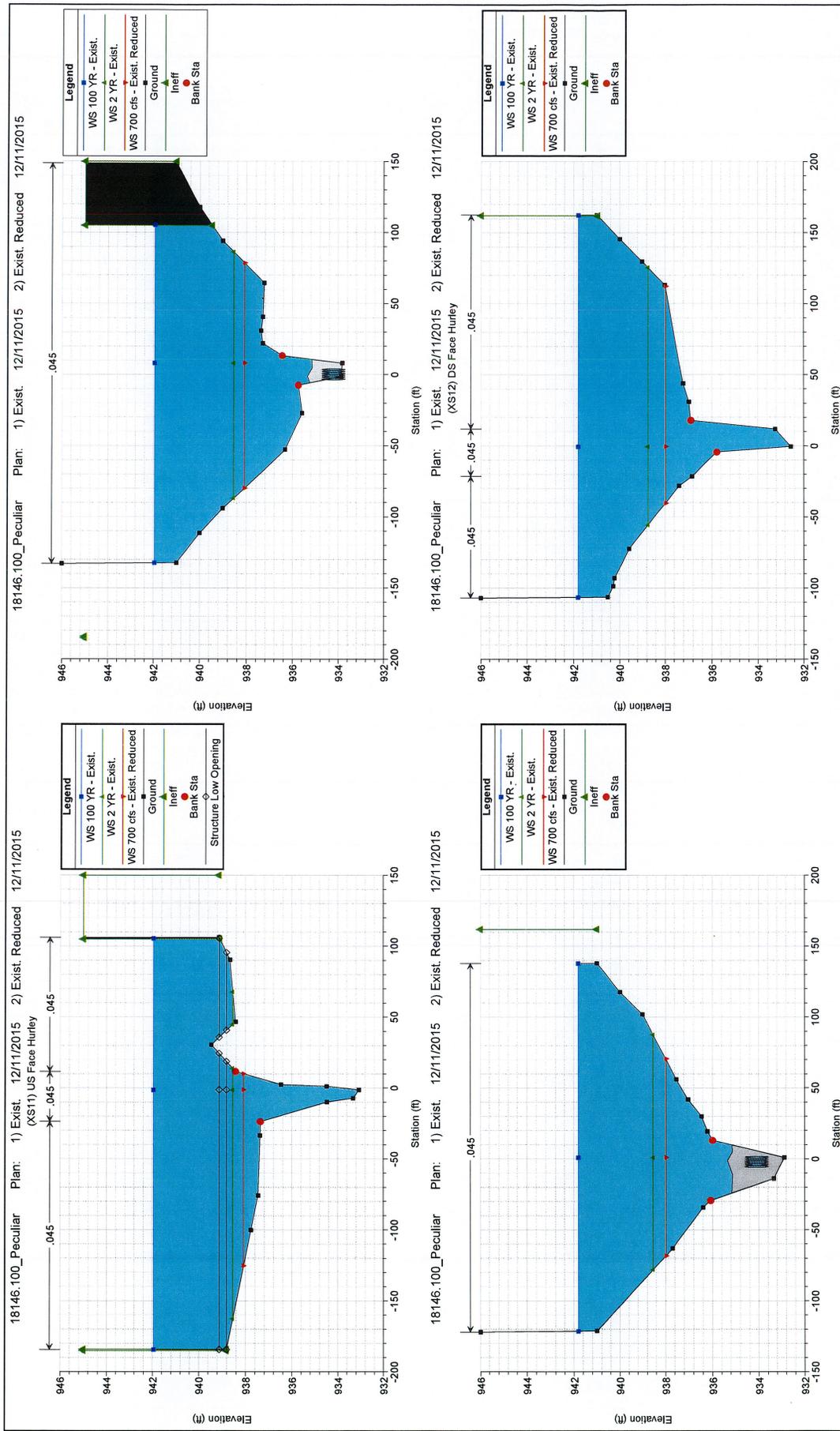


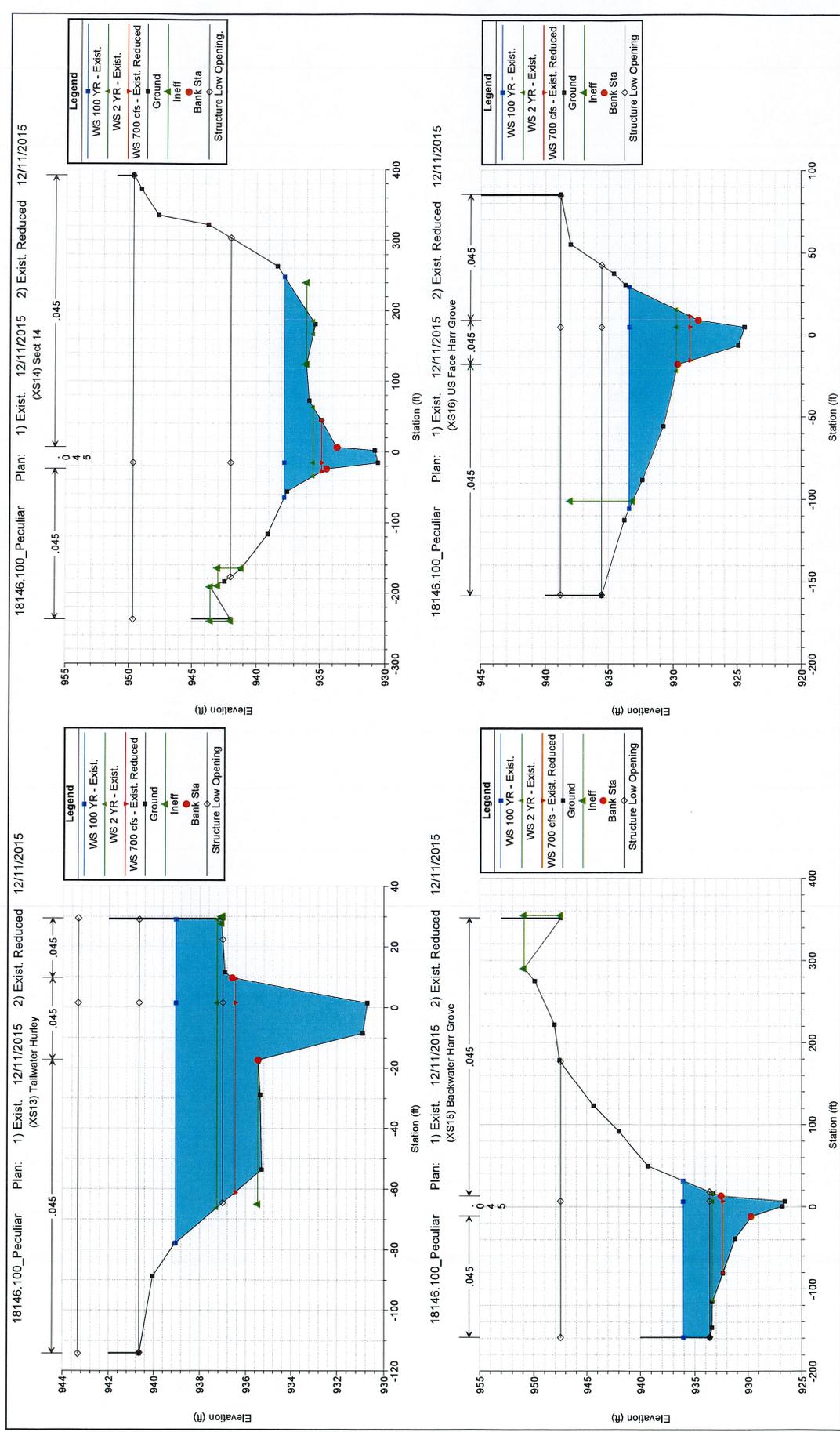
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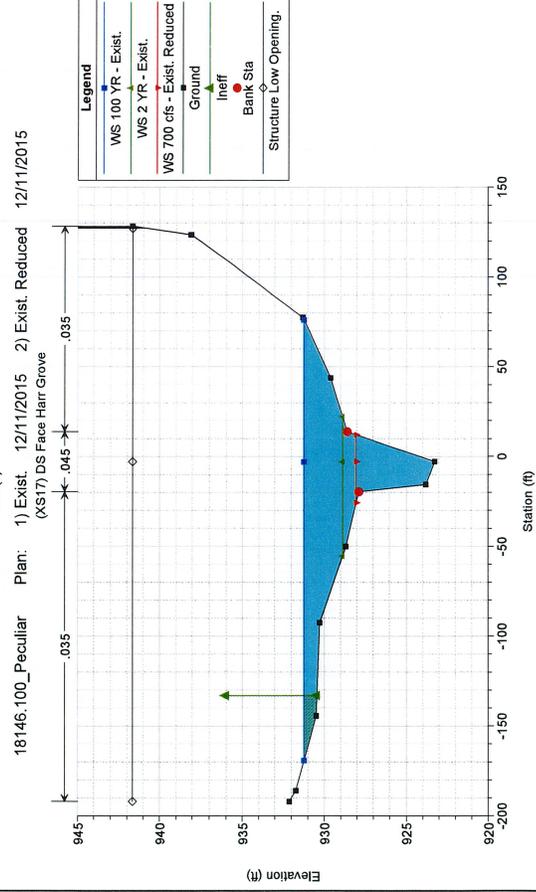
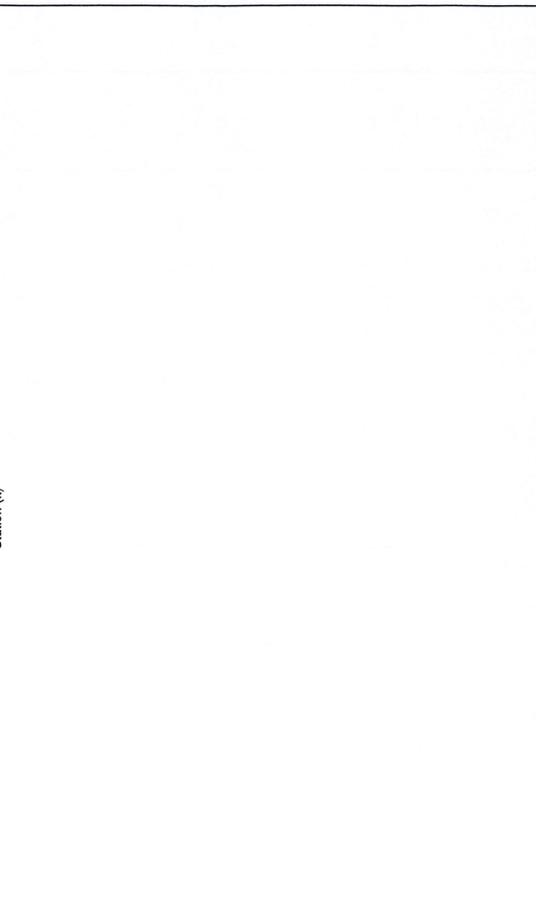
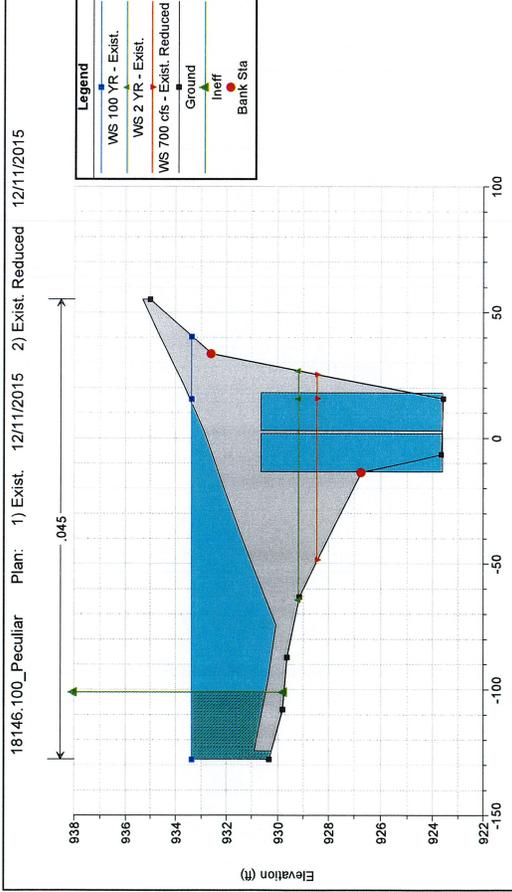
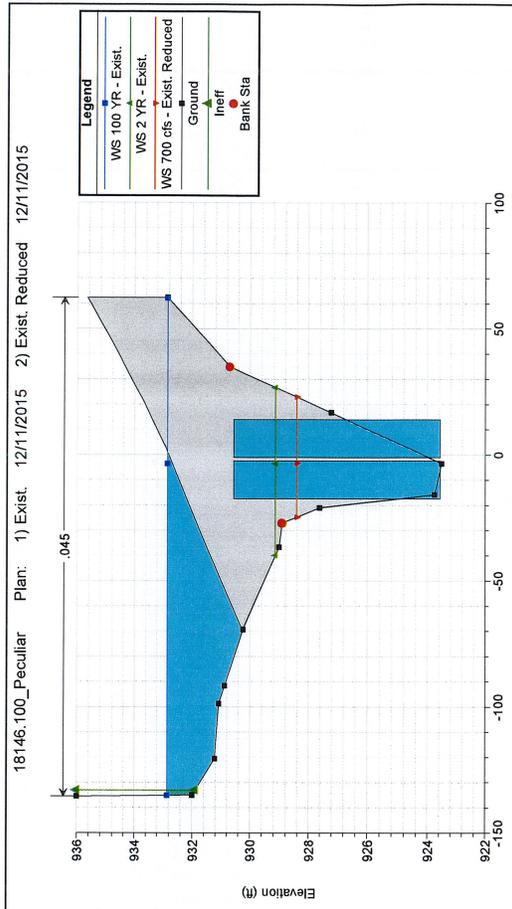


18146.100_Peculiar Plan: 1) Exist. 12/11/2015 2) Exist. Reduced 12/11/2015



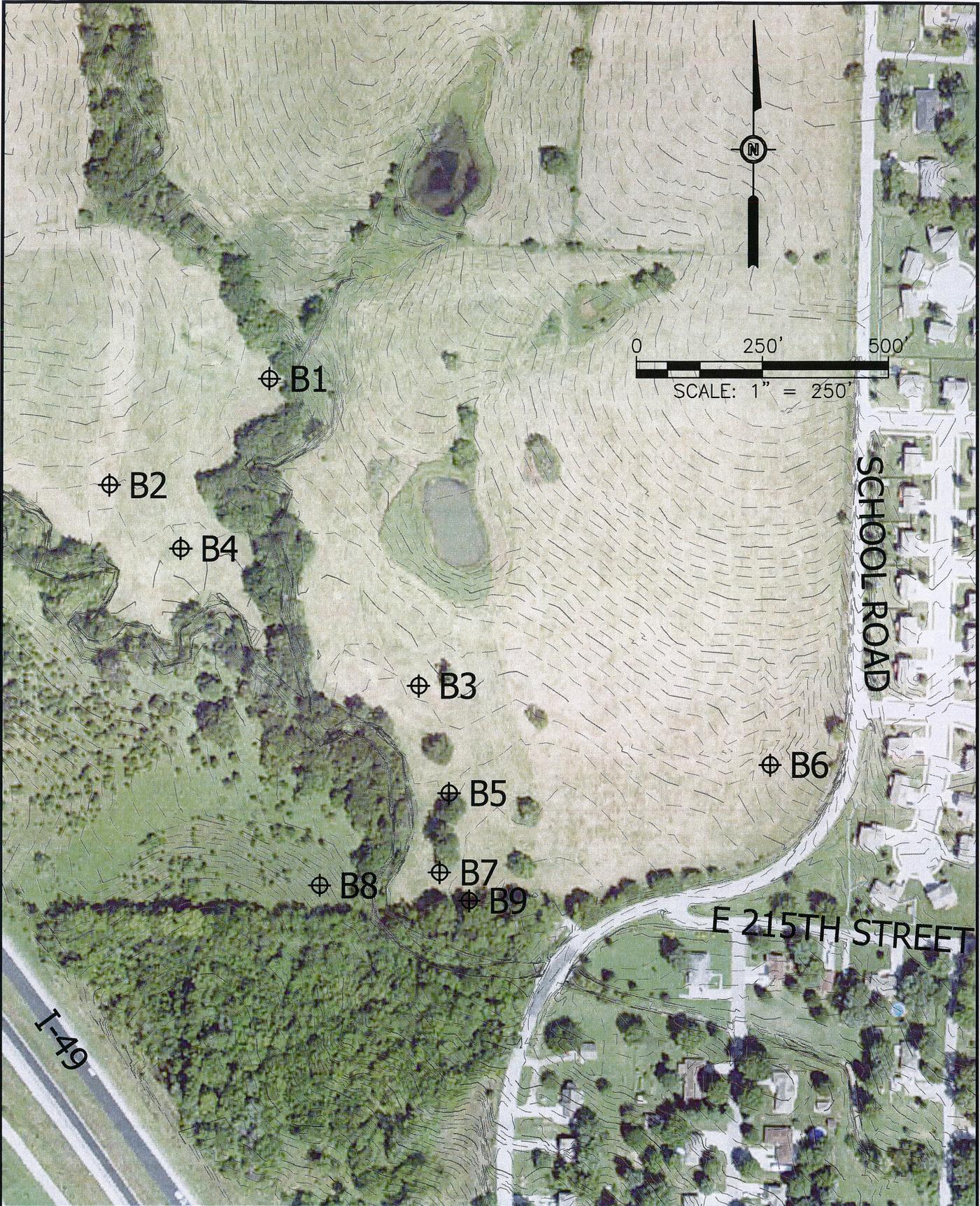






APPENDIX D
BORING LOCATIONS MAP

Drawing Name: C:\Users\dcr01439\Desktop\Peculiar 18146.100\18146.100_Geotech_DCF.dwg Layout Name: Layout1 Plotted on: 11/11/2015 11:02:35 PM



WWW.BARTWEST.COM

PECULIAR DETENTION BASIN BORING LOCATIONS

PROJ NO:
18146.100
DATE:
12-16-2015

SHEET NUMBER
1
OF 1

APPENDIX E
BORING LOGS

BORING LOG NO. B-1

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:

Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 957 (Ft.)										LL-PL-PI
	DEPTH ELEVATION (Ft.)										
1.0	TOPSOIL	956									
3.0	LEAN CLAY , trace silt, gray brown to brown, very stiff to hard	954			10		9000 (HP)		13	90	45-21-24
8.5	FAT CLAY , gray brown to dark brown, stiff	948.5			24		7500 (HP)		21	100	
10.4	SHALY FAT CLAY , brown to olive brown, highly weathered	946.5			13		9000 (HP)		22	106	
10.7	LIMESTONE , olive brown to gray brown, highly weathered	946.5									
	<i>Auger Refusal on limestone at 10.7 Feet</i>										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered



Boring Started: 8/17/2015

Boring Completed: 8/17/2015

Drill Rig: RC-550

Driller: RC-Zach

Project No.: 02155135

Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

BORING LOG NO. B-2

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:
Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	DEPTH ELEVATION (Ft.)										LL-PL-PI
	TOPSOIL	1.0									
	LEAN CLAY , trace silt, gray brown to brown, medium stiff to stiff	3.0			6		9000 (HP)		18	94	
	FAT CLAY , gray brown, stiff	5.0			9		3000 (HP)		23	101	51-19-32
	SHALE , brown to olive brown, highly weathered	8.5			13				27	98	
	LIMESTONE , gray to gray brown, highly weathered	11.8									
	Auger Refusal on limestone at 12.1 Feet	12.1									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 8/17/2015	Boring Completed: 8/17/2015
Drill Rig: RC-550	Driller: RC-Zach
Project No.: 02155135	Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

BORING LOG NO. B-3

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:

Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 954.3 (Ft.)										LL-PL-PI
	ELEVATION (Ft.)										
1.0	TOPSOIL	953.5									
3.0	LEAN CLAY , trace silt, gray brown to brown, very stiff to hard	951.5			6		9000 (HP)		17		
5.0	FAT CLAY , gray brown to dark brown, stiff				12		4000 (HP)		23	103	55-18-37
8.5	SHALY FAT CLAY , brown to olive brown, highly weathered	946			15		9000 (HP)		25	96	
10.8	LIMESTONE , olive brown to gray brown, highly weathered	943.5									
11.0	LIMESTONE , olive brown to gray brown, highly weathered <i>Auger Refusal on limestone at 11 Feet</i>	943.5									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered



Boring Started: 8/17/2015

Boring Completed: 8/17/2015

Drill Rig: RC-550

Driller: RC-Zach

Project No.: 02155135

Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

BORING LOG NO. B-4

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:
Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 955.9 (Ft.)										LL-PL-PI
	ELEVATION (Ft.)										
1.0	TOPSOIL	955									
	LEAN CLAY , trace silt, gray brown to brown, very stiff to hard				6		7000 (HP)		22	94	
					8		2500 (HP)		24	99	46-17-29
8.5	FAT CLAY , trace silt, brown to olive brown, medium stiff to stiff	947.5					2000 (HP)		25	101	
10.3	LIMESTONE , olive brown to gray brown, highly weathered	945.5									
10.6	LIMESTONE , olive brown to gray brown, highly weathered <i>Auger Refusal on limestone at 10.6 Feet</i>	945.5									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered



Boring Started: 8/17/2015

Boring Completed: 8/17/2015

Drill Rig: RC-550

Driller: RC-Zach

Project No.: 02155135

Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT_8/27/15

BORING LOG NO. B-5

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:
Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 953.3 (Ft.)										ELEVATION (Ft.)
	TOPSOIL	1.0									
	LEAN CLAY , trace roots, dark brown, stiff	3.0			17		4000 (HP)		25	90	44-22-22
	FAT CLAY , gray brown, stiff	5.0			23			2900	25	101	53-20-33
	SHALE , brown to gray brown, highly weathered	9.0									
	LIMESTONE , gray brown to gray	9.8			10				25	93	
	LIMESTONE , gray brown to gray	10.0			X				14		
	Auger Refusal on limestone at 11 Feet	11.0									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered

13910 West 96th Terrace
Lenexa, Kansas

Boring Started: 8/20/2015

Boring Completed: 8/20/2015

Drill Rig: CME-850

Driller: DB

Project No.: 02155135

Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

BORING LOG NO. B-6

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:

Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	DEPTH										ELEVATION (Ft.)
1.0	TOPSOIL	956.5									
	FAT CLAY , gray brown to reddish brown, stiff to very stiff				24			3700	18	100	57-18-39
					23		7000 (HP)		24	101	
		5									
					10			8800	18	123	
	SHALEY FAT CLAY , light brown, hard	8.5									
		10									
	SHALE , olive brown to gray, highly weathered	12.5			4				11		
		14.5									
	Auger Refusal on limestone at 14.5 Feet	943									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Boring Started: 8/20/2015

Boring Completed: 8/20/2015

Drill Rig: CME-850

Driller: DB

Project No.: 02155135

Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT_8/27/15

BORING LOG NO. B-7

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:

Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 952.7 (Ft.)										LL-PL-PI
	DEPTH ELEVATION (Ft.)										
	TOPSOIL	1.0									
	FAT CLAY , gray brown, stiff to very stiff	951.5		X	8		5000 (HP)		26		53-22-31
	SHALE , brown to dark brown, highly weathered	943.5		■	18		8000 (HP)				54-21-33
	LIMESTONE , gray, highly weathered	942.5		■	11				32	90	
	LIMESTONE , gray, highly weathered <i>Auger Refusal on limestone at 10.3 Feet</i>	942.5									
		10.3									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered



Boring Started: 8/20/2015

Boring Completed: 8/20/2015

Drill Rig: CME-850

Driller: DB

Project No.: 02155135

Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT_8/27/15

BORING LOG NO. B-8

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:
Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (FL.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 961.6 (Fl.) ELEVATION (FL.)										LL-PL-PI
	TOPSOIL	1.0									
	FAT CLAY , gray brown to brown, medium stiff to stiff	5.0							29		85-31-54
	SHALEY FAT CLAY , brown, medium stiff to stiff	9.5							24		64-38-26
		5.0							21		
		9.5							23		
	Auger Refusal on apparent limestone at 9.5 Feet	9.5									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS
Groundwater not encountered



Terracon
13910 West 96th Terrace
Lenexa, Kansas

Boring Started: 8/22/2015
Drill Rig: HA
Project No.: 02155135

Boring Completed: 8/22/2015
Driller: AP
Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

BORING LOG NO. B-9

PROJECT: Proposed Earthen Dam for 20 acre Lake

CLIENT: Bartlett & West Engineers, Inc.
Jefferson City, Missouri

SITE:

Peculiar, Missouri

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	HAND PENETROMETER (psf)	LABORATORY TORVANE/HP (psf)	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Surface Elev.: 951.5 (Ft.)										LL-PL-PI
	DEPTH ELEVATION (Ft.)										
	TOPSOIL	1.0									
	FAT CLAY , dark brown, very stiff	3.0			15		8000 (HP)		24	90	
	FAT CLAY , brown to gray brown, stiff	7.5			10		4000 (HP)				51-19-32
	SHALE , gray brown to gray, highly weathered	7.8									
	<i>Auger Refusal on limestone at 7.8 Feet</i>	944									
		943.5									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Continuous Flight Auger

See Exhibit A-1 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

WATER LEVEL OBSERVATIONS

Groundwater not encountered



Boring Started: 8/20/2015

Boring Completed: 8/20/2015

Drill Rig: CME-850

Driller: DB

Project No.: 02155135

Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_02155135.GPJ TERRACON2015.GDT 8/27/15

APPENDIX F
DETENTION BASIN CURVES

DRY BASIN ELEVATION - DISCHARGE CURVE

RCB	
B (ft)	7
D (ft)	5
FL Elev.	946.4
# of Cells	1

7' X 5'				
Elevation (ft)	HW/D	Q/B	Box Discharge (cfs)	Discharge (cfs)
946	-0.1			
947	0.1	0	0.0	0.0
948	0.3	4	28.0	28.0
949	0.5	10	70.0	70.0
950	0.7	16	112.0	112.0
951	0.9	24	168.0	168.0
952	1.1	32	224.0	224.0
953	1.3	40	280.0	280.0
954	1.5	45	315.0	315.0
955	1.7	51	357.0	357.0
956	1.9	56	392.0	392.0
957	2.1	61	427.0	427.0
958	2.3	65	455.0	455.0
959	2.5	69	483.0	483.0
960	2.7	72	504.0	504.0
961	2.9	76	532.0	532.0
962	3.1	80	560.0	560.0
963	3.3	81	567.0	567.0
964	3.5	84	588.0	588.0
965	3.7	90	630.0	630.0
966	3.9	92	644.0	644.0
967	4.1	95	665.0	665.0
Water surface elevation	Ratio of headwater depth over height of box culvert	Flow volume per 1' width of box culvert	Maximum flow volume through box culvert	Maximum flow volume through system

WET BASIN ELEVATION - DISCHARGE CURVE

Riser Structure

L (ft)	7
W (ft)	7
Elev.	957.5

RCB

B (ft)	7
D (ft)	8
Elev.	946.4
# of Cells	1

Weir and Orifice Eqns from MoDOT EPG

Elevation (ft)	Head (ft)	7' X 7'	7' X 7'	7' X 8'			Discharge (cfs)
		Weir Discharge	Orifice Discharge	HW/D	Q/B	Box Discharge (cfs)	
947	0.0	0	0	0.1	0	0	0.0
948	0.0	0	0	0.2	3	0	0.0
949	0.0	0	0	0.3	9	0	0.0
950	0.0	0	0	0.5	20	140	0.0
951	0.0	0	0	0.6	27	189	0.0
952	0.0	0	0	0.7	35	245	0.0
953	0.0	0	0	0.8	42	294	0.0
954	0.0	0	0	1.0	58	406	0.0
955	0.0	0	0	1.1	67	469	0.0
956	0.0	0	0	1.2	73	511	0.0
957	0.0	0	0	1.3	80	560	0.0
958	0.5	27.7	166.8	1.5	92	644	27.7
959	1.5	145.5	289.0	1.6	99	693	145.5
960	2.5	318.7	373.0	1.7	104	728	318.7
961	3.5	535.3	441.4	1.8	110	770	441.4
962	4.5	791.0	500.5	2.0	120	840	500.5
963	5.5	1083.3	553.3	2.1	125	875.0	553.3
964	6.5	1410.4	601.5	2.2	129	903.0	601.5
965	7.5	1771.0	646.1	2.3	131	917.0	646.1
966	8.5	2164.6	687.9	2.5	140	980.0	687.9
967	9.5	2590.4	727.2	2.6	143	1001.0	727.2
Water surface elevation	Headwater depth over top of riser structure	Maximum flow volume over riser structure as a weir	Maximum flow volume through riser structure as an orifice	Ratio of headwater depth over height of box culvert	Flow volume per 1' width of box culvert	Maximum flow volume through box culvert	Maximum flow volume through system

DRY TO WET BASIN - PHASE 1 (DRY) ELEVATION - DISCHARGE CURVE

RCB	
B (ft)	7
D (ft)	5
Elev.	946.4
# of Cells	1

Elevation (ft)	7' X 5'			Discharge (cfs)
	HW/D	Q/B	Box Discharge (cfs)	
946	-0.1			
947	0.1	0	0.0	0.0
948	0.3	4	28.0	28.0
949	0.5	10	70.0	70.0
950	0.7	16	112.0	112.0
951	0.9	24	168.0	168.0
952	1.1	32	224.0	224.0
953	1.3	40	280.0	280.0
954	1.5	45	315.0	315.0
955	1.7	51	357.0	357.0
956	1.9	56	392.0	392.0
957	2.1	61	427.0	427.0
958	2.3	65	455.0	455.0
959	2.5	69	483.0	483.0
960	2.7	72	504.0	504.0
961	2.9	76	532.0	532.0
962	3.1	80	560.0	560.0
963	3.3	81	567.0	567.0
964	3.5	84	588.0	588.0
965	3.7	90	630.0	630.0
966	3.9	92	644.0	644.0
967	4.1	95	665.0	665.0
Water surface elevation	Ratio of headwater depth over height of box culvert	Flow volume per 1' width of box culvert	Maximum flow volume through box culvert	Maximum flow volume through system

DRY TO WET BASIN - PHASE 2 (WET) ELEVATION - DISCHARGE CURVE

Riser Structure	
L (ft)	7
W (ft)	7
Elev.	957.5

RCB	
B (ft)	7
D (ft)	8
Elev.	946.4
# of Cells	1

Weir and Orifice Eqns from MoDOT EPG

Elevation (ft)	Head (ft)	7' X 7'	7' X 7'	7' X 8'			Discharge excluding downstream RCB controls (cfs)	Discharge including downstream RCB controls (cfs)
		Weir Discharge	Orifice Discharge	HW/D	Q/B	Box Discharge (cfs)		
947	0.0	0.0	0.0	0.1	0	0	0.0	0.0
948	0.0	0.0	0.0	0.2	3	0	0.0	0.0
949	0.0	0.0	0.0	0.3	9	0	0.0	0.0
950	0.0	0.0	0.0	0.5	20	140	0.0	0.0
951	0.0	0.0	0.0	0.6	27	189	0.0	0.0
952	0.0	0.0	0.0	0.7	35	245	0.0	0.0
953	0.0	0.0	0.0	0.8	42	294	0.0	0.0
954	0.0	0.0	0.0	1.0	58	406	0.0	0.0
955	0.0	0.0	0.0	1.1	67	469	0.0	0.0
956	0.0	0.0	0.0	1.2	73	511	0.0	0.0
957	0.0	0.0	0.0	1.3	80	560	0.0	0.0
958	0.5	27.7	166.8	1.5	92	644	27.7	27.7
959	1.5	145.5	289.0	1.6	99	693	145.5	145.5
960	2.5	316.6	373.0	1.7	104	728	316.6	316.6
961	3.5	530.4	441.4	1.8	110	770	441.4	441.4
962	4.5	781.9	500.5	2.0	120	840	500.5	500.5
963	5.5	1068.2	553.3	2.1	125	875.0	553.3	553.3
964	6.5	1387.4	601.5	2.2	129	903.0	601.5	601.5
965	7.5	1738.2	646.1	2.3	131	917.0	646.1	646.1
966	8.5	2119.6	687.9	2.5	140	980.0	687.9	687.9
967	9.5	2531.0	727.2	2.6	143	1001.0	727.2	727.2
Water surface elevation	Headwater depth over top of riser structure	Maximum flow volume over riser structure as a weir	Maximum flow volume through riser structure as an orifice	Ratio of headwater depth over height of box culvert	Flow volume per 1' width of box culvert	Maximum flow volume through box culvert	Maximum flow volume through system	Maximum flow volume through system

ELEVATION-STORAGE CURVES

Dry Basin Option	
Elevation (ft)	Storage (ac-ft)
945	0.00
946	0.09
947	0.26
948	0.53
949	1.00
950	1.74
951	2.78
952	4.28
953	7.11
954	11.96
955	19.65
956	30.82
957	46.09
958	66.00
959	90.03
960	119.00
961	151.97
962	188.50
963	228.32
964	271.30
965	317.50
966	371.18

Wet Basin Option	
Elevation (ft)	Storage (ac-ft)
945	0.00
946	0.00
947	0.00
948	0.00
949	0.00
950	0.00
951	0.00
952	0.00
953	0.00
954	0.00
955	0.00
956	0.00
957	0.00
958	11.68
959	36.55
960	64.71
961	95.95
962	130.16
963	167.15
964	206.93
965	251.79
966	300.74
967	353.71

Dry-to-Wet Option - Phase 1	
Elevation (ft)	Storage (ac-ft)
945	0.00
946	0.09
947	0.25
948	0.52
949	0.99
950	1.74
951	2.80
952	4.29
953	7.04
954	11.76
955	19.28
956	30.21
957	44.73
958	63.44
959	86.11
960	114.51
961	147.62
962	184.64
963	225.18
964	269.01
965	318.08
966	371.05

Dry-to-Wet Option - Phase 2	
Elevation (ft)	Storage (ac-ft)
945	0.00
946	0.00
947	0.00
948	0.00
949	0.00
950	0.00
951	0.00
952	0.00
953	0.00
954	0.00
955	0.00
956	0.00
957	0.00
958	10.80
959	34.98
960	64.55
961	98.56
962	136.23
963	177.18
964	221.22
965	270.33
966	323.30
967	380.09

APPENDIX G

DETENTION BASIN HYDROLOGY AND HYDRAULICS

Peculiar Detention Basin Design

Preliminary Detention Basin Options - Hydrology & Hydraulic Summaries

Date: December 16, 2015

Project No.: 18146.100

HYDROLOGY:

Subbasin	Drainage Area (mi ²)	Existing Composite CN	Future* Composite CN	Lag Time (min)
1*	0.51	78.64	81.39	29.59
2*	0.31	75.52	81.86	28.59
3	0.56	81.54	81.54	35.91
4*	0.27	93.79	95.41	22.71

* Results based on future developed conditions within CID

HYDRAULIC RESULTS (Q_p, Q_o, High Water Elevations):

DRY BASIN OPTION:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	432.8	957.2
5	1613.3	1738.4	483.8	959.0
10	2048.0	2177.5	508.7	960.2
25	2485.8	2615.5	537.7	961.2
50	2875.8	3005.0	560.4	962.1
100	3316.6	3449.2	567.5	963.0

* Results based on future developed conditions within CID

DRY-TO-WET BASIN OPTION, PHASE 1-DRY:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	434.9	957.3
5	1613.3	1738.4	486.5	959.2
10	2048.0	2177.5	512.1	960.3
25	2485.8	2615.5	540.6	961.3
50	2875.8	3005.0	561.0	962.1
100	3316.6	3449.2	568.9	963.1

* Results based on future developed conditions within CID

DRY-TO-WET BASIN OPTION, PHASE 2-WET:

Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	358.1	960.3
5	1613.3	1738.4	469.8	961.5
10	2048.0	2177.5	519.3	962.4
25	2485.8	2615.5	563.7	963.2
50	2875.8	3005.0	599.2	964.0
100	3316.6	3449.2	634.3	964.7

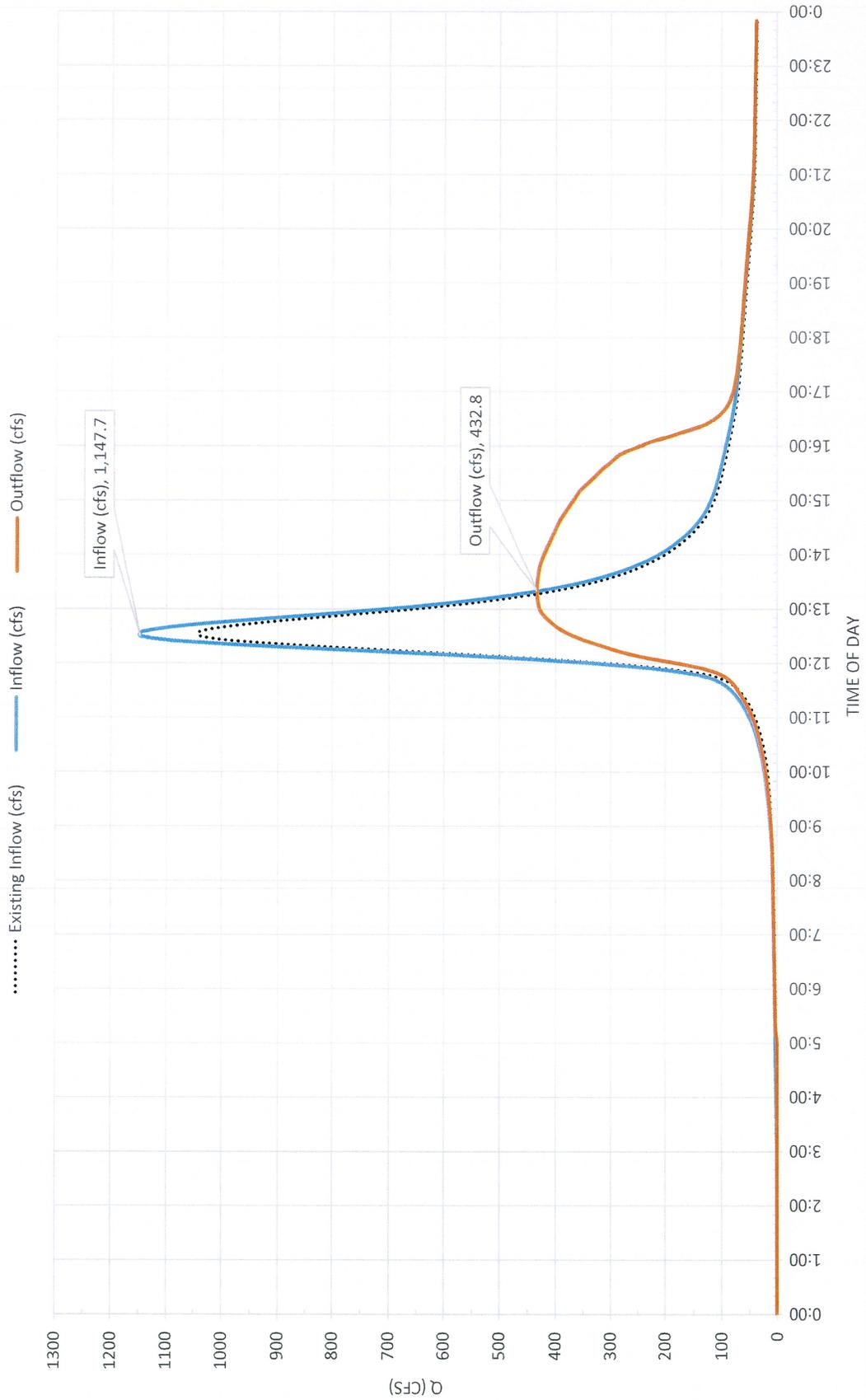
* Results based on future developed conditions within CID

WET BASIN OPTION:

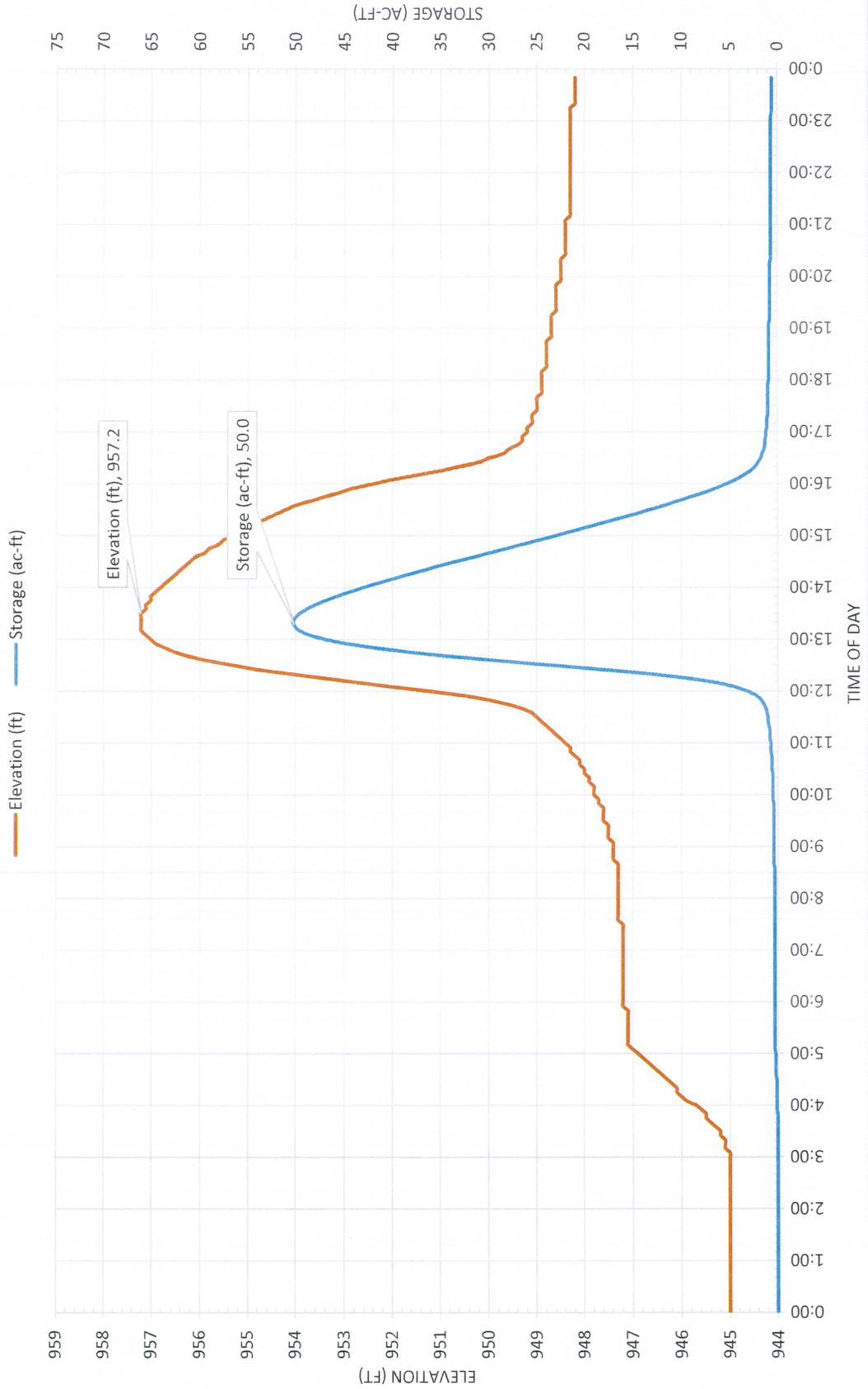
Storm Frequency	Existing Peak Inflow (cfs)	Future* Peak Inflow (cfs)	Future* Peak Outflow (cfs)	Future* Peak Elevation
2	1039.7	1147.7	363.4	960.4
5	1613.3	1738.4	477.2	961.6
10	2048.0	2177.5	529.7	962.7
25	2485.8	2615.5	576.4	963.5
50	2875.8	3005.0	613.0	964.3
100	3316.6	3449.2	650.1	965.1

* Results based on future developed conditions within CID

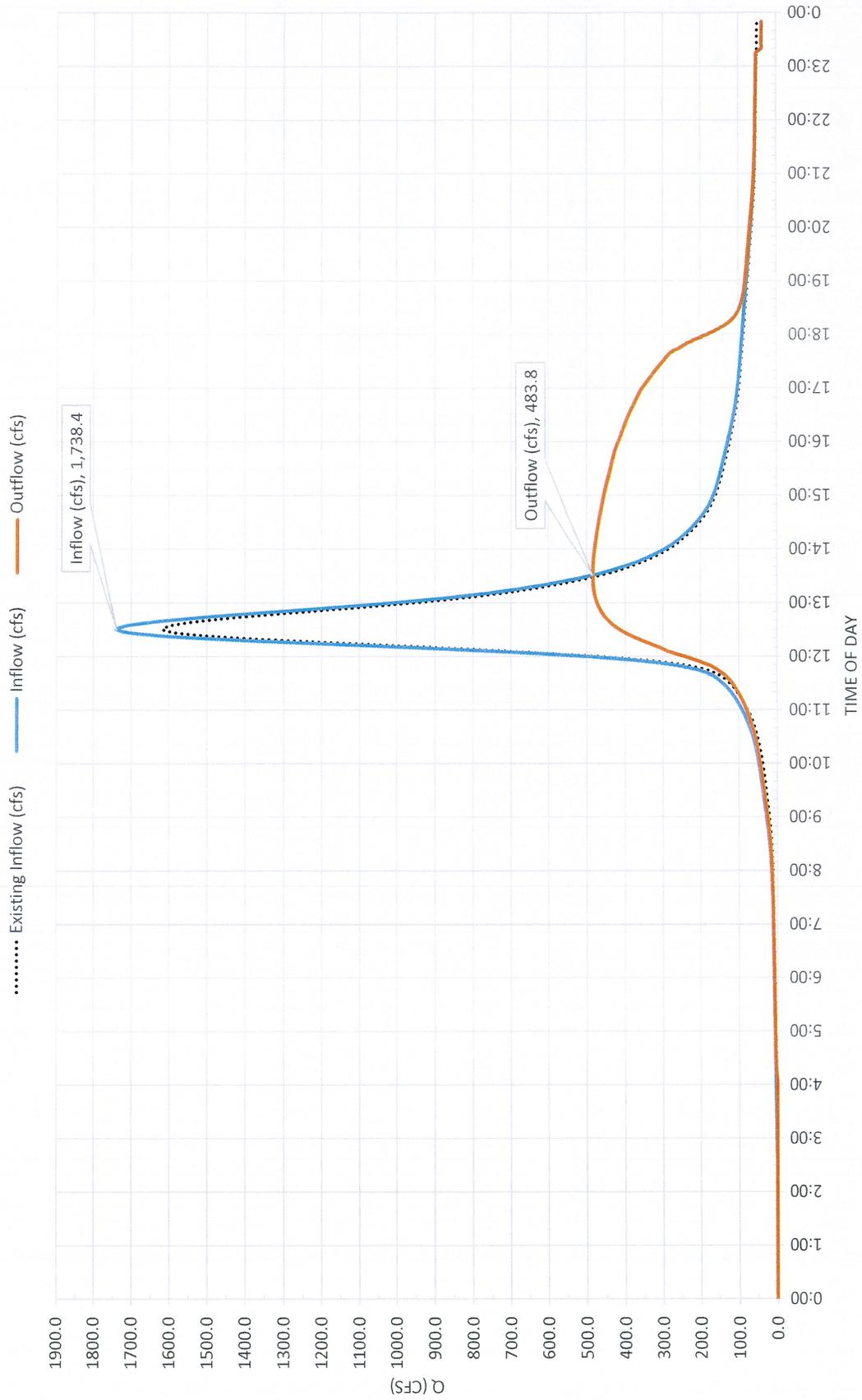
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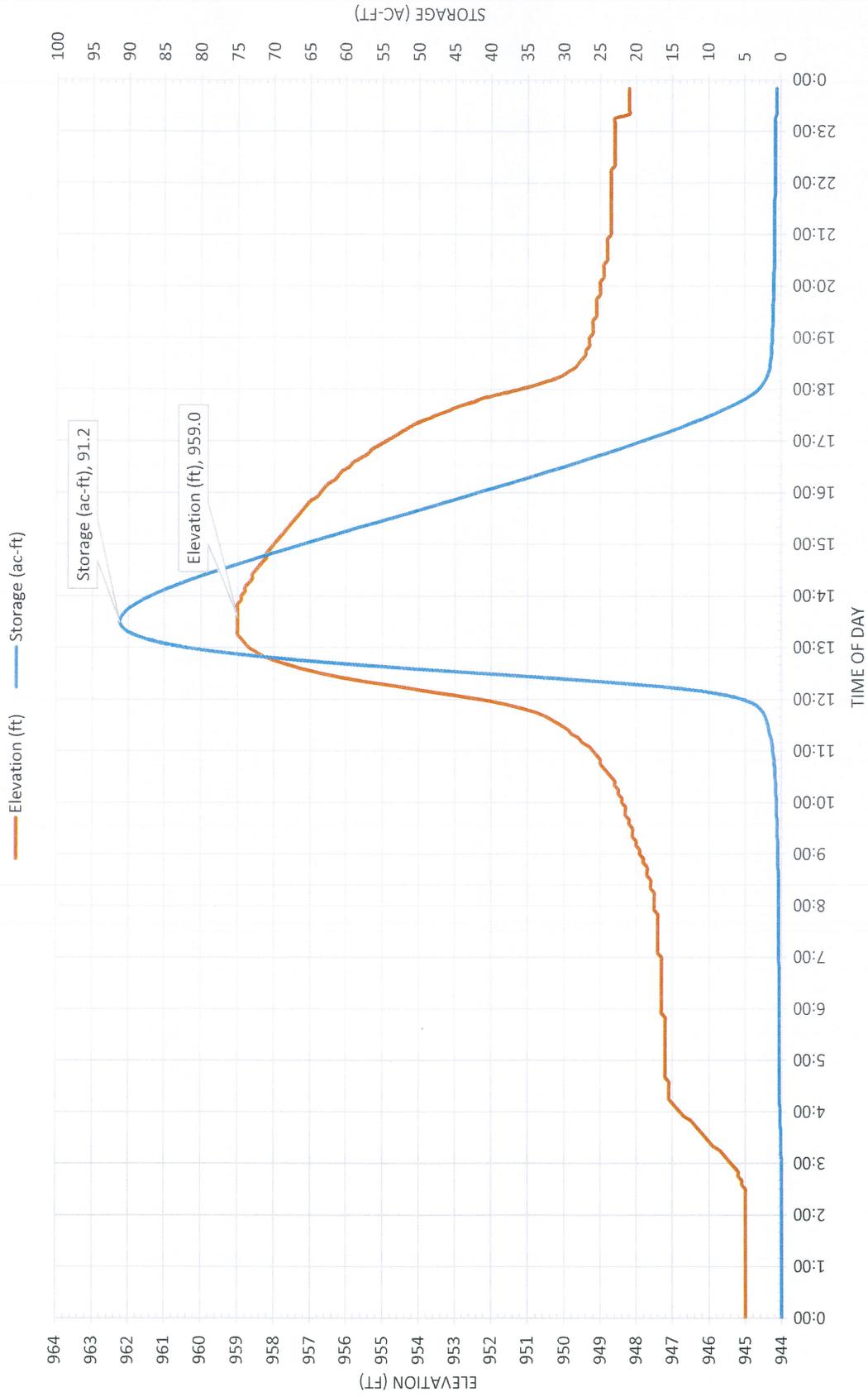
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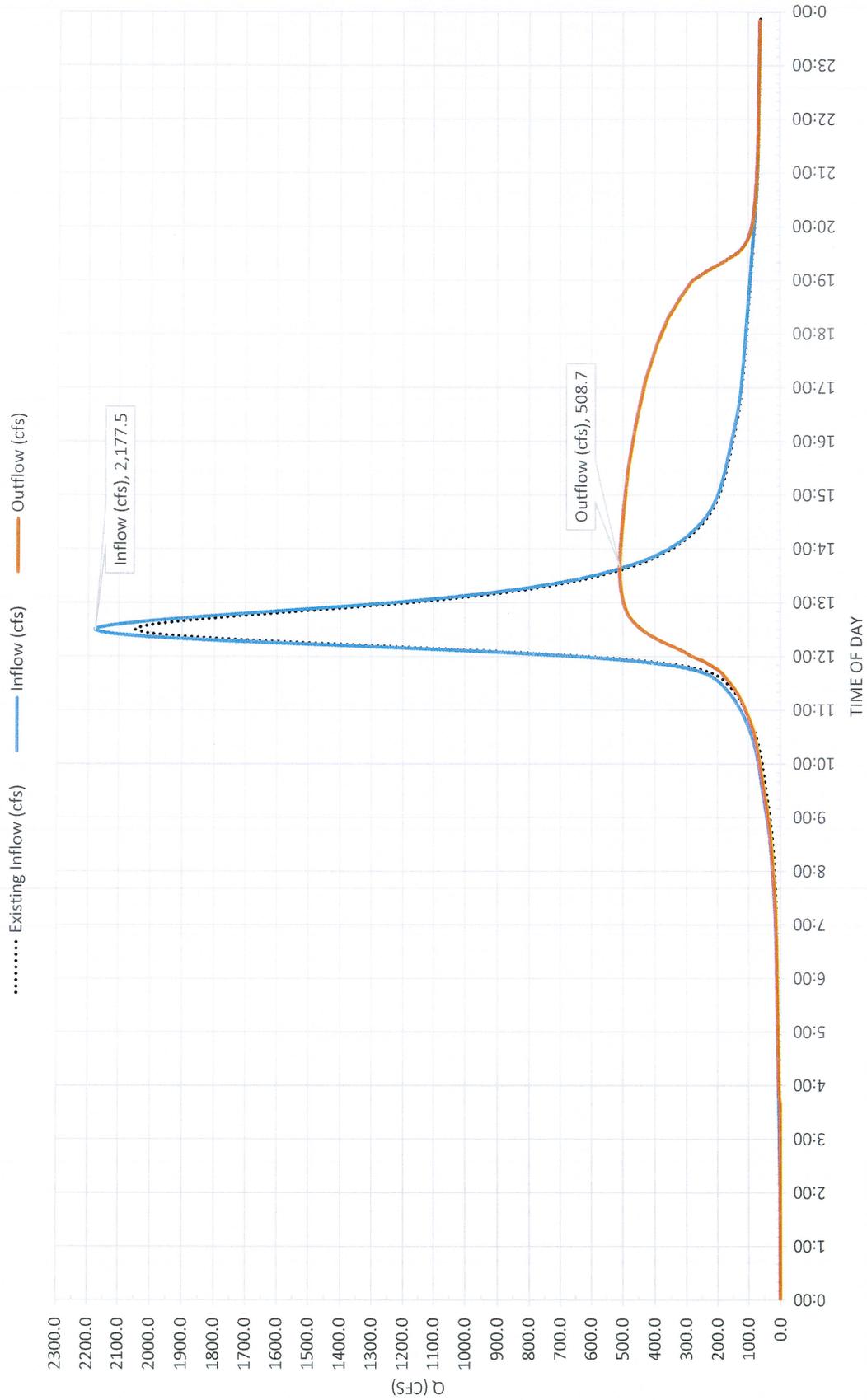
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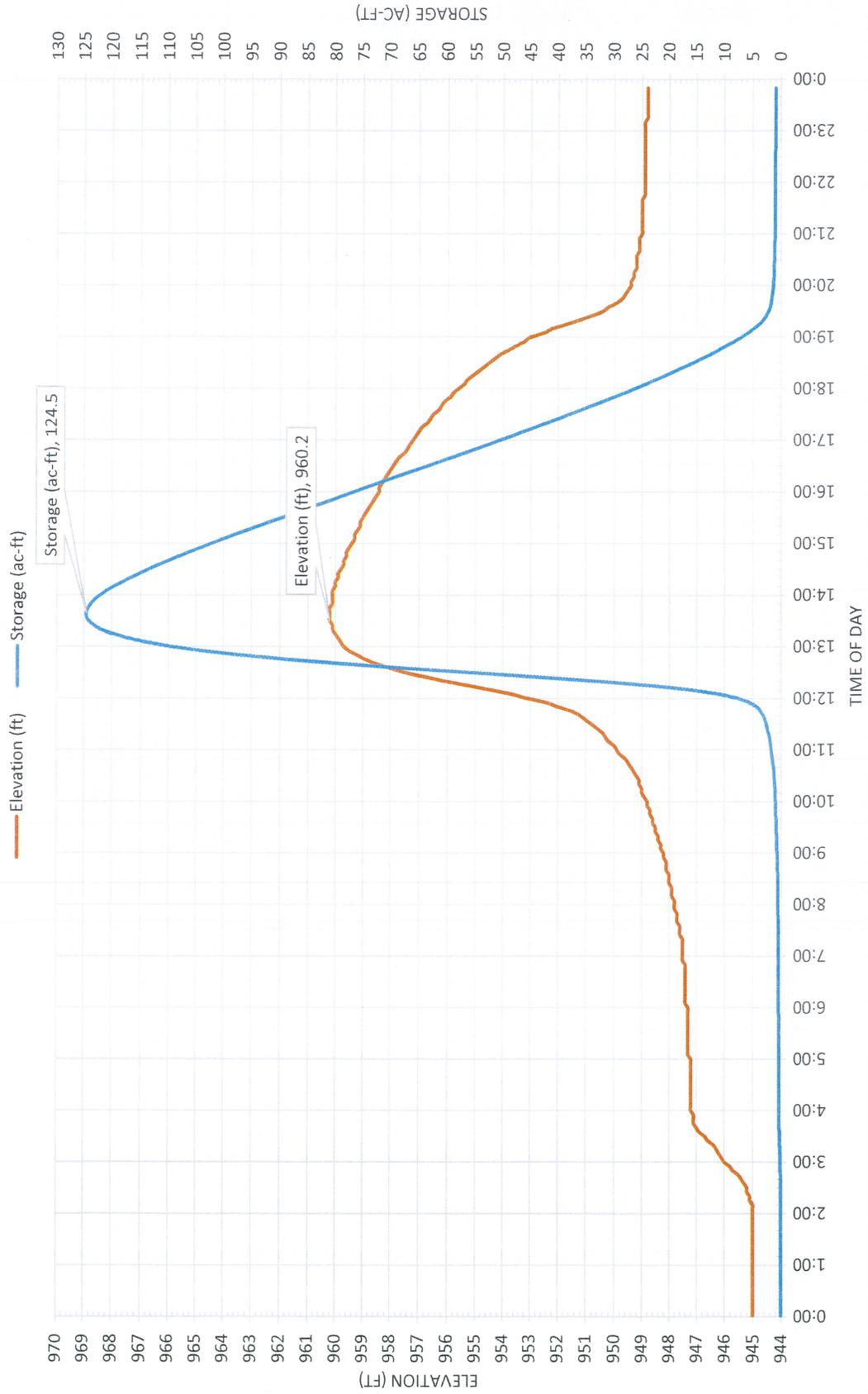
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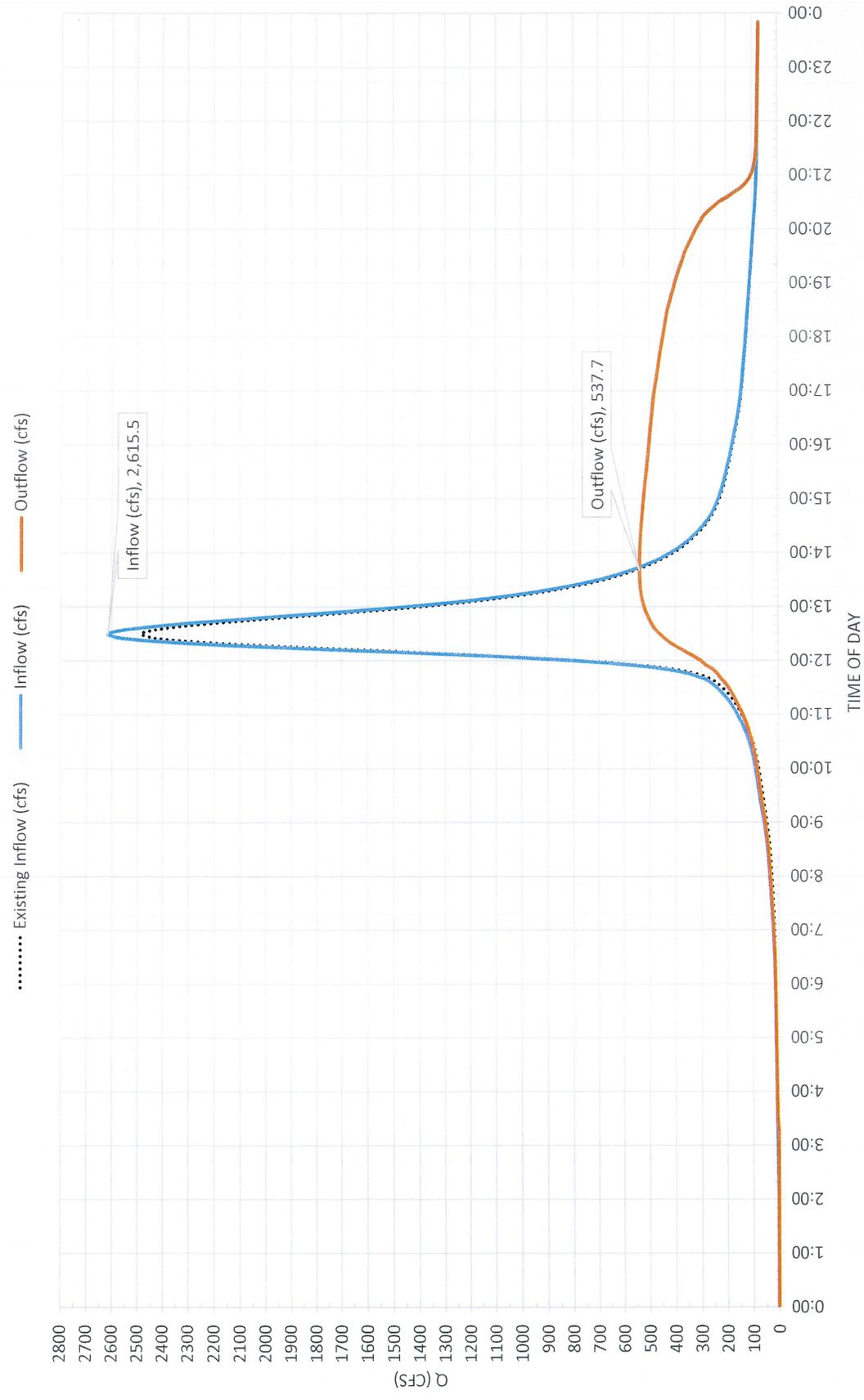
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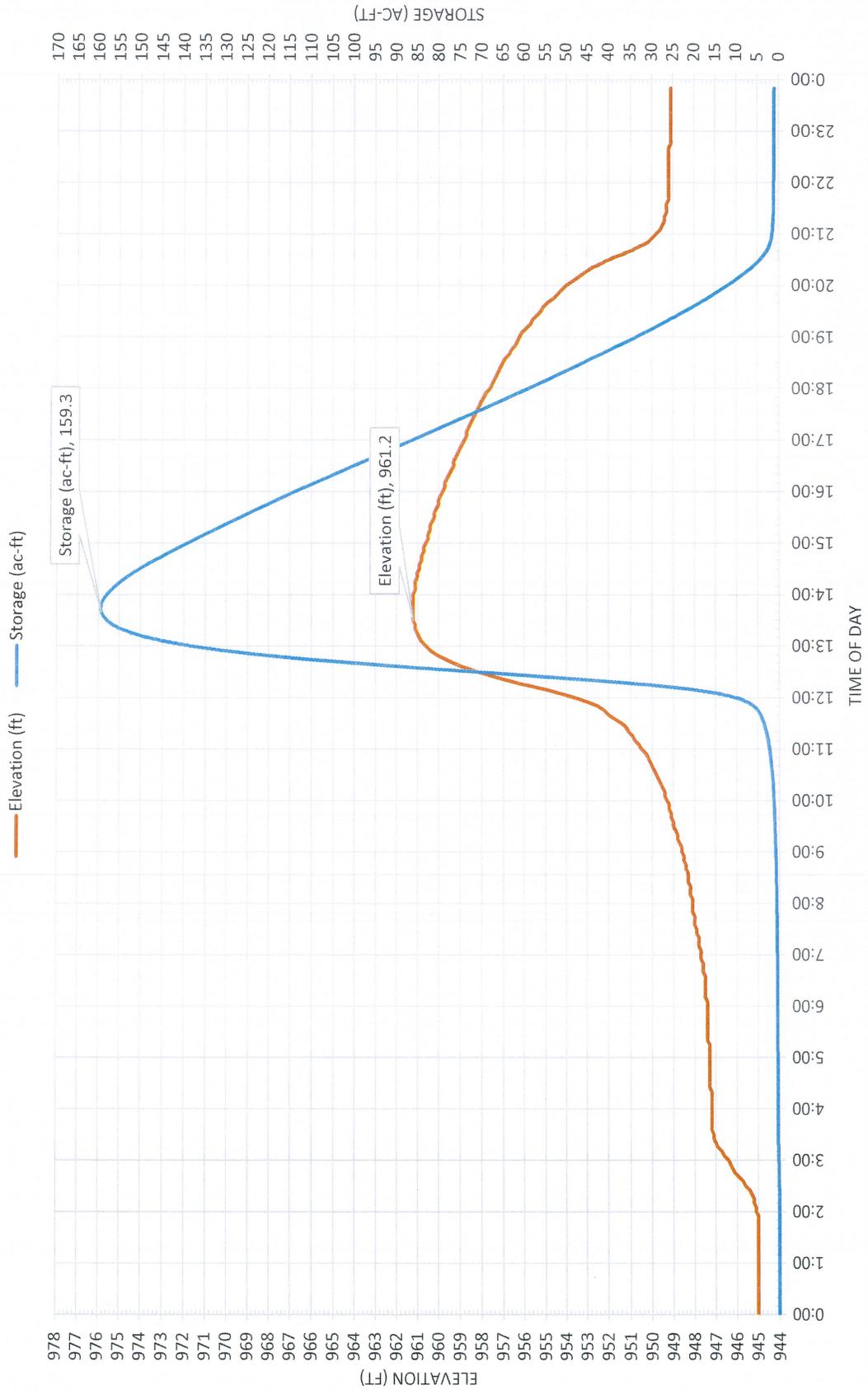
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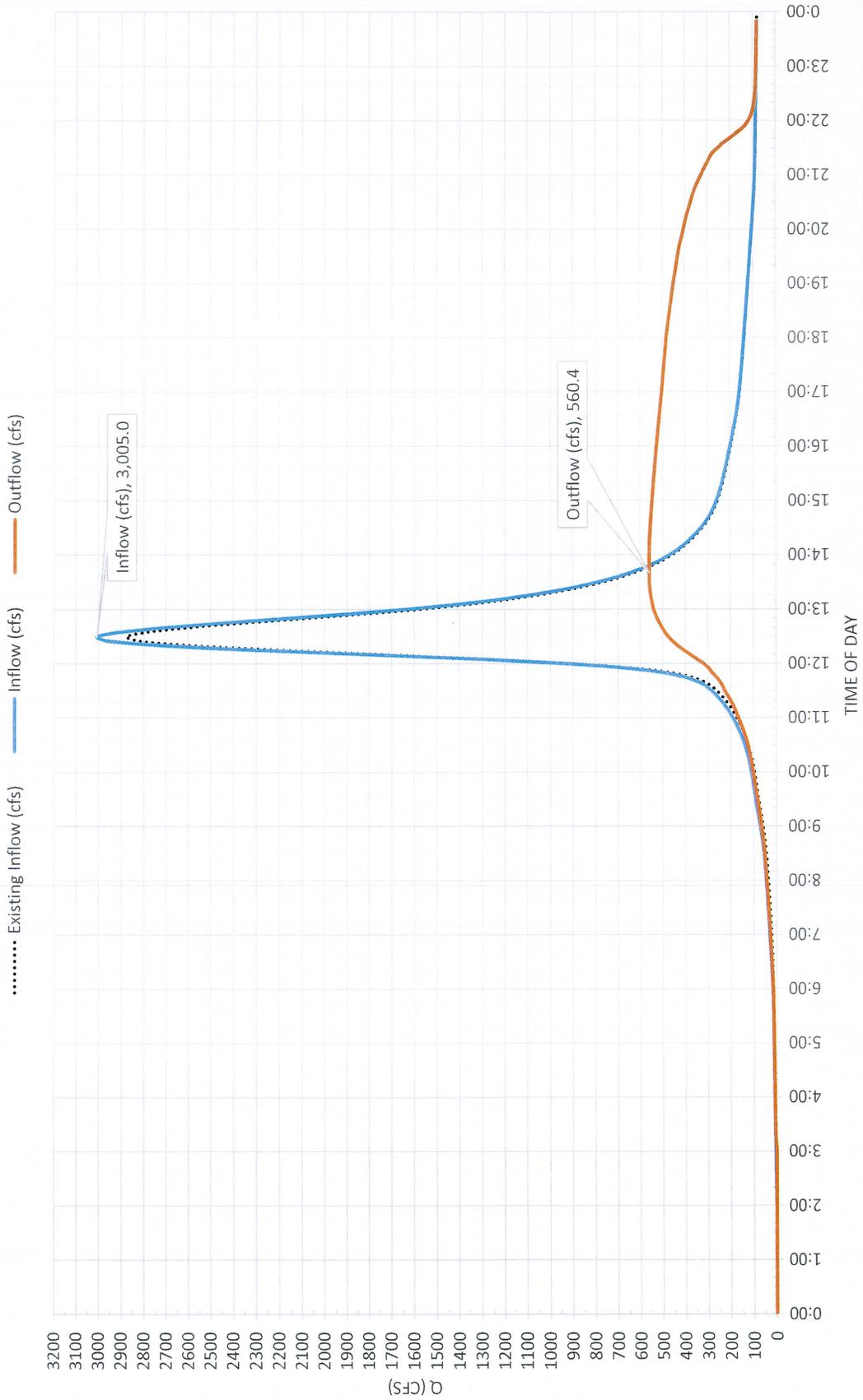
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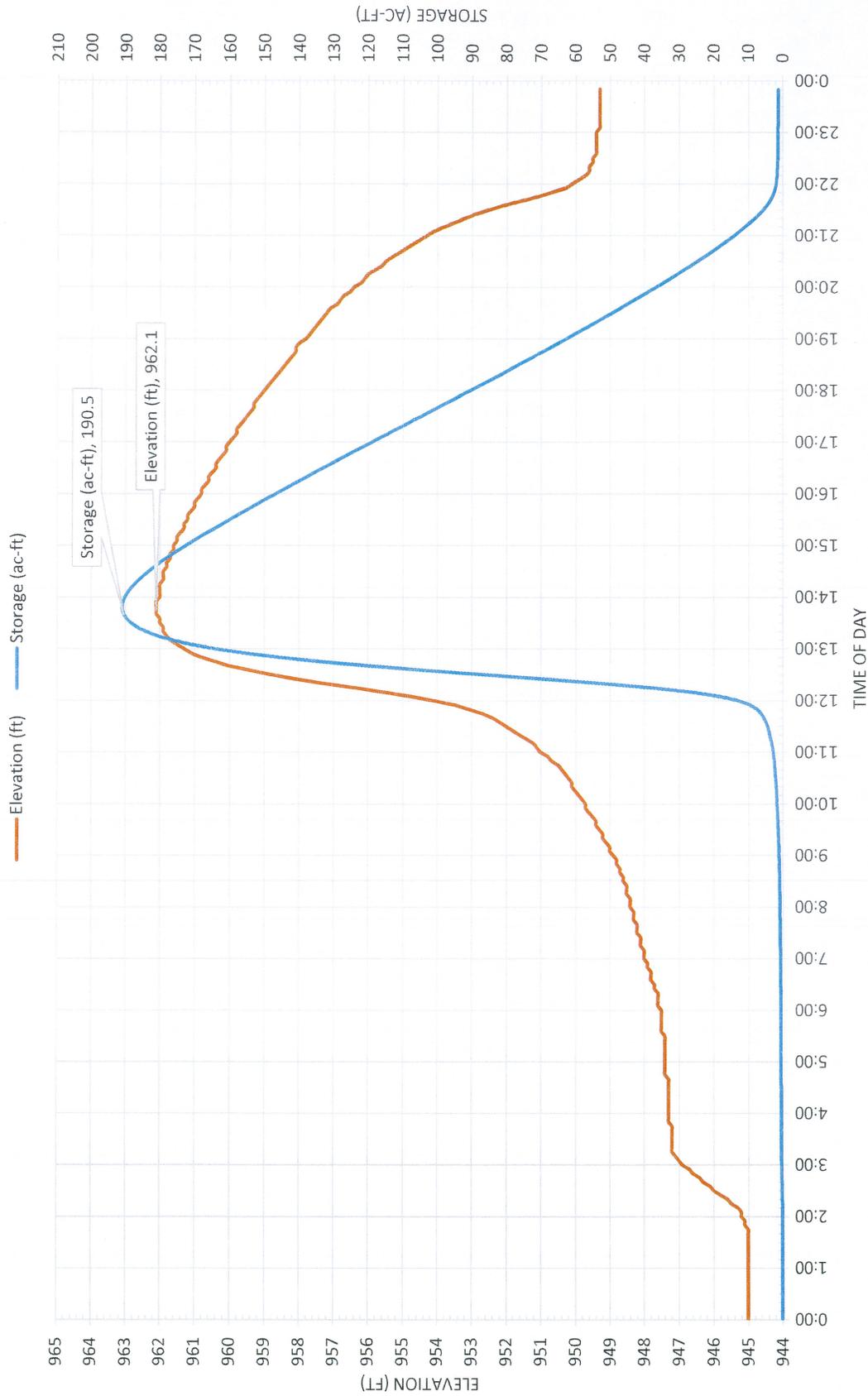
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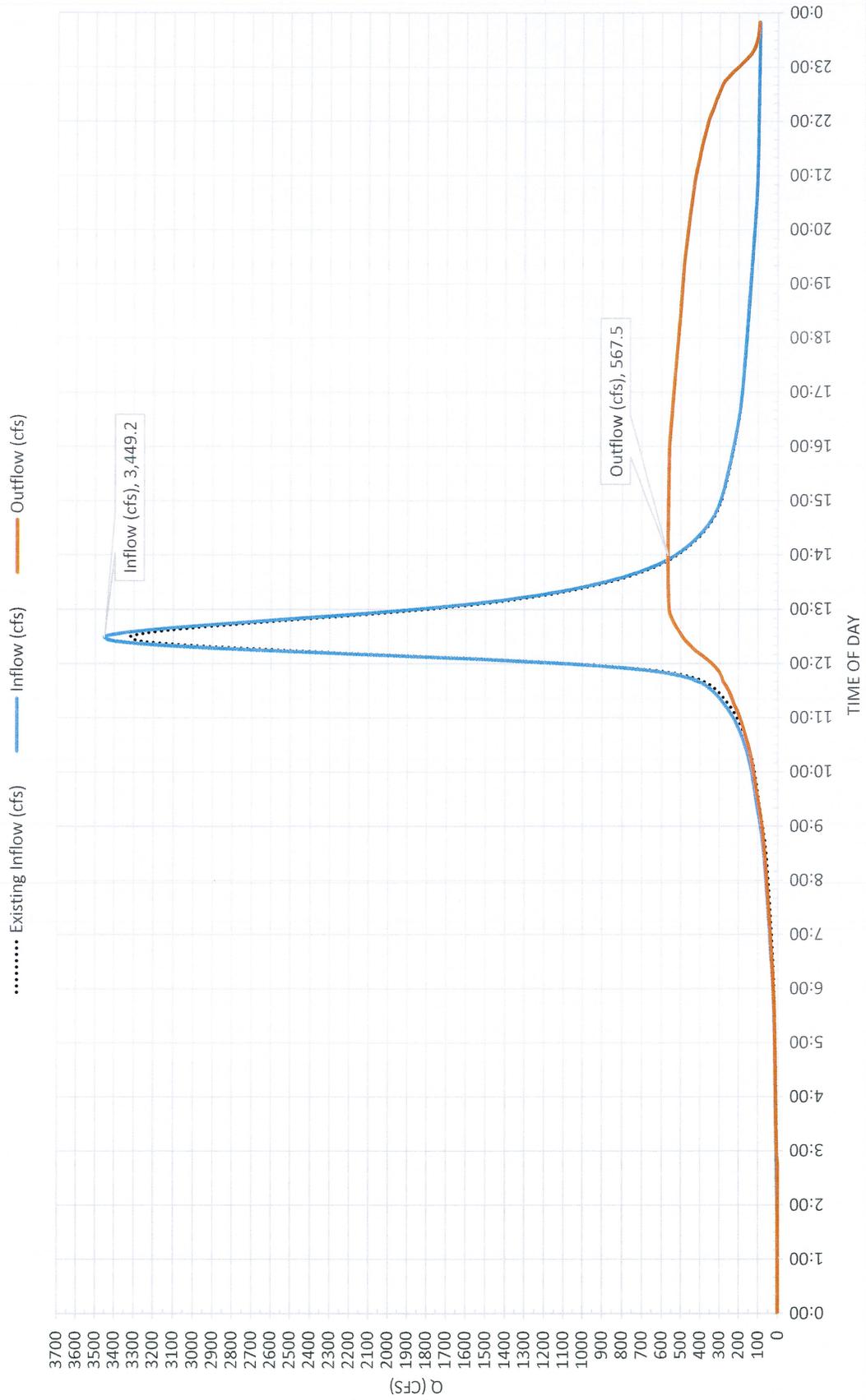
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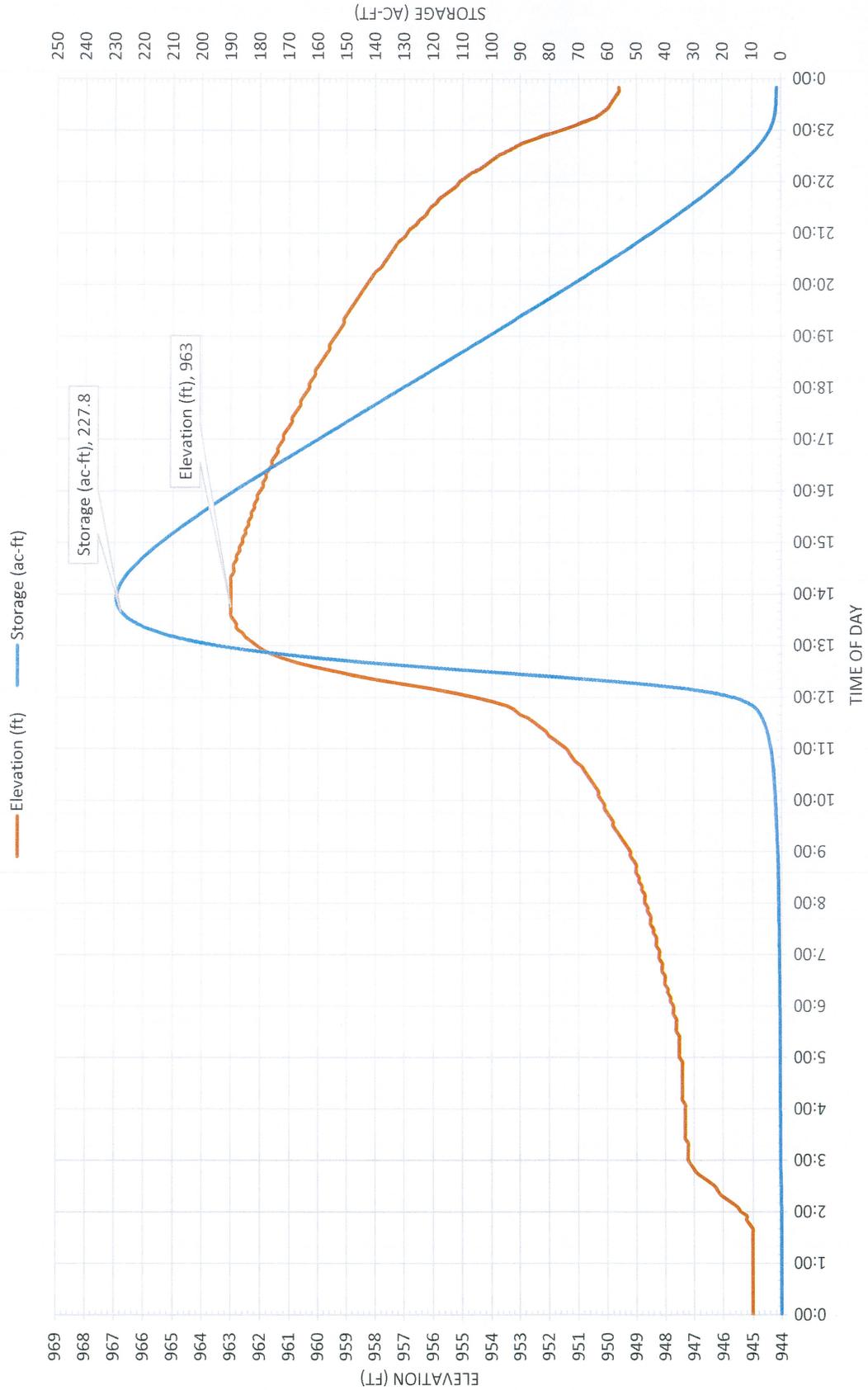
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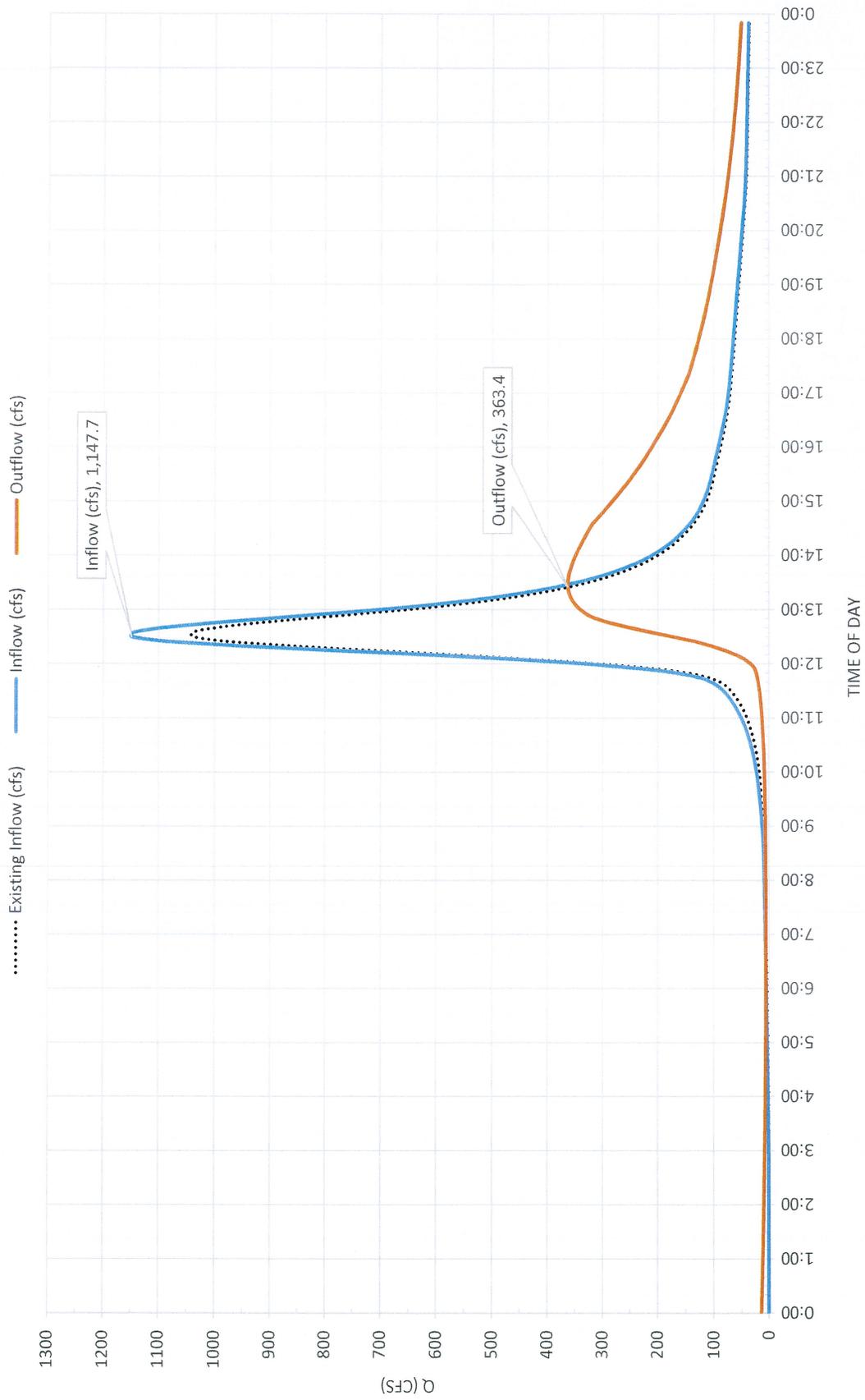
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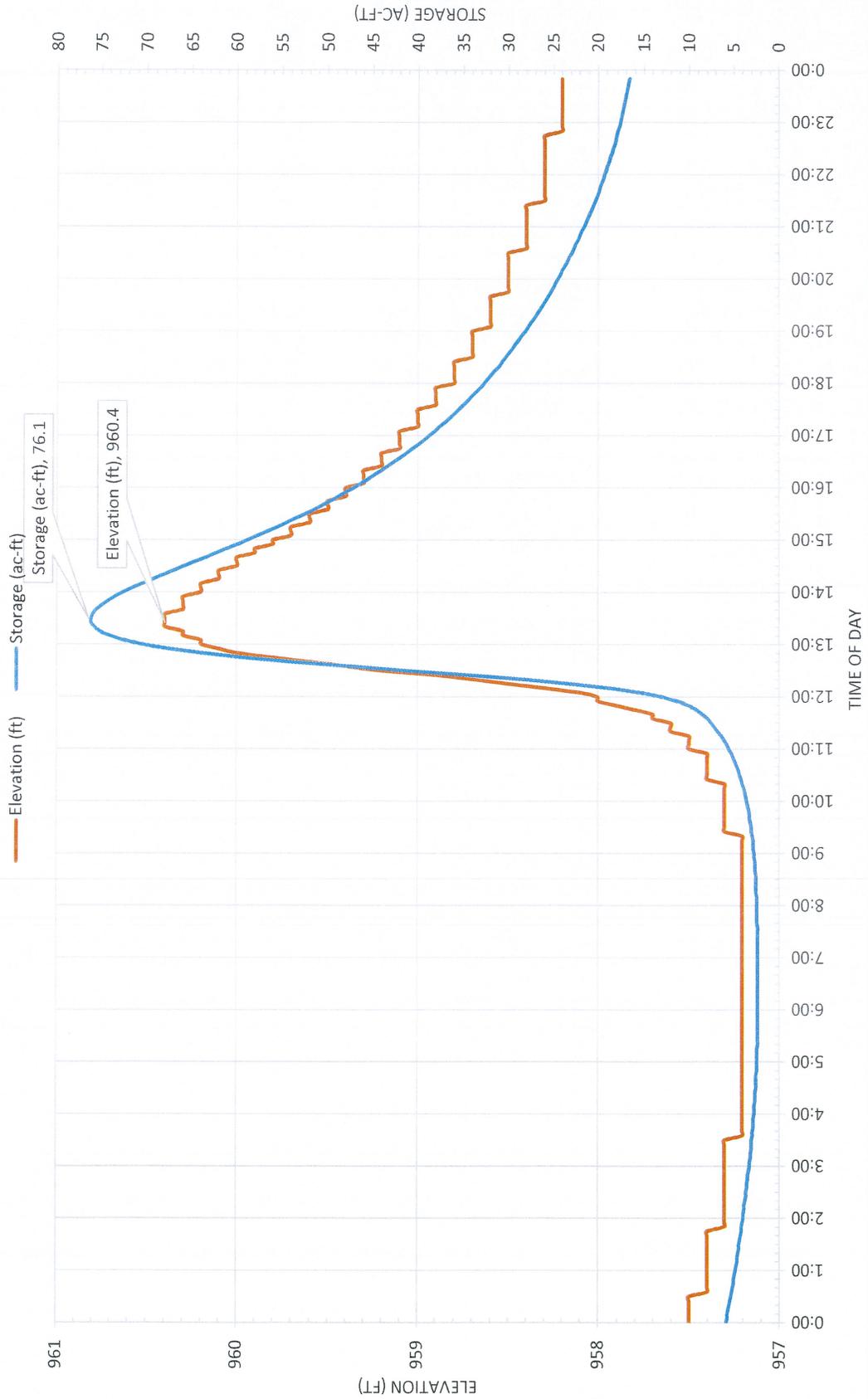
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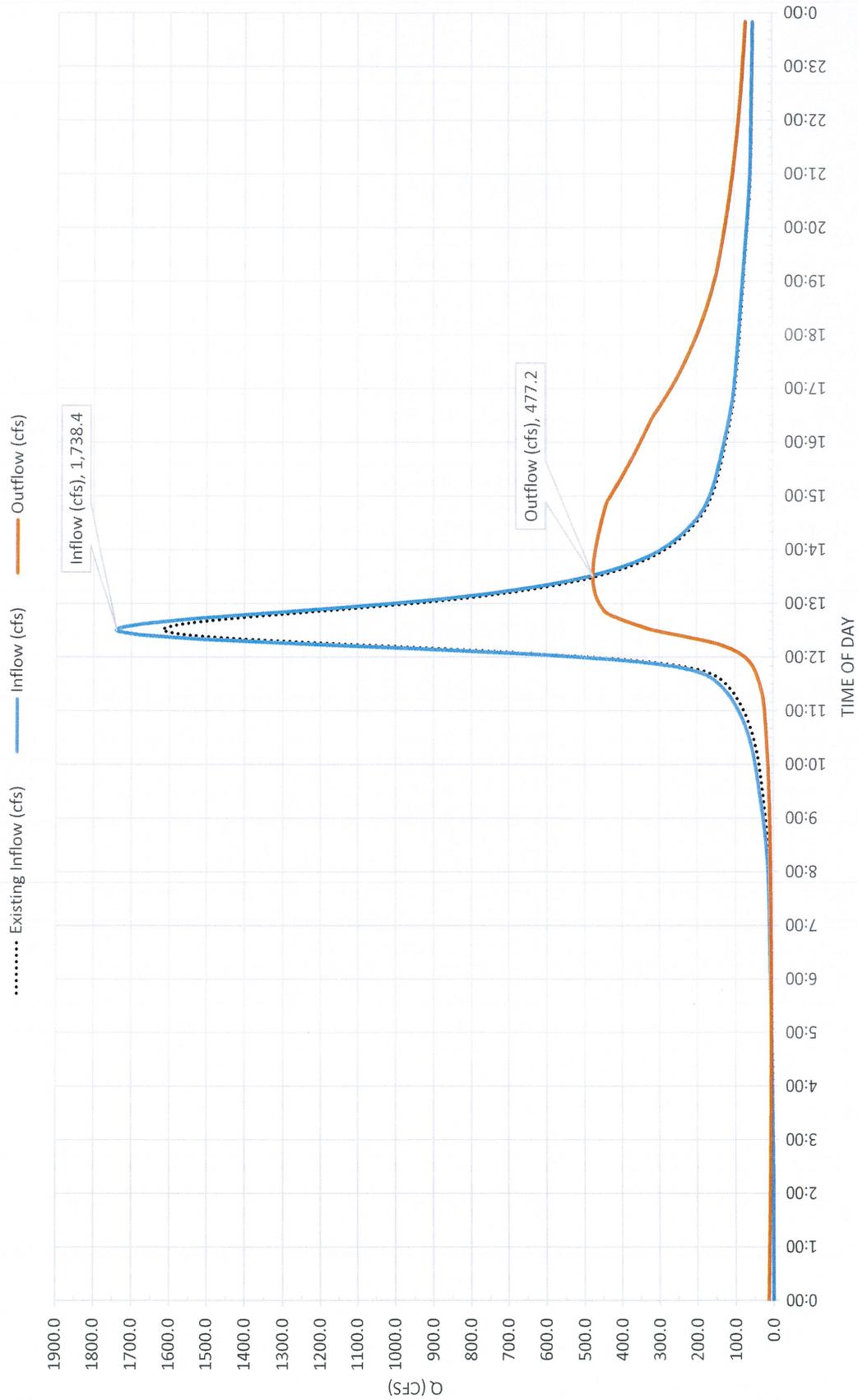
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2-YEAR STORM EVENT
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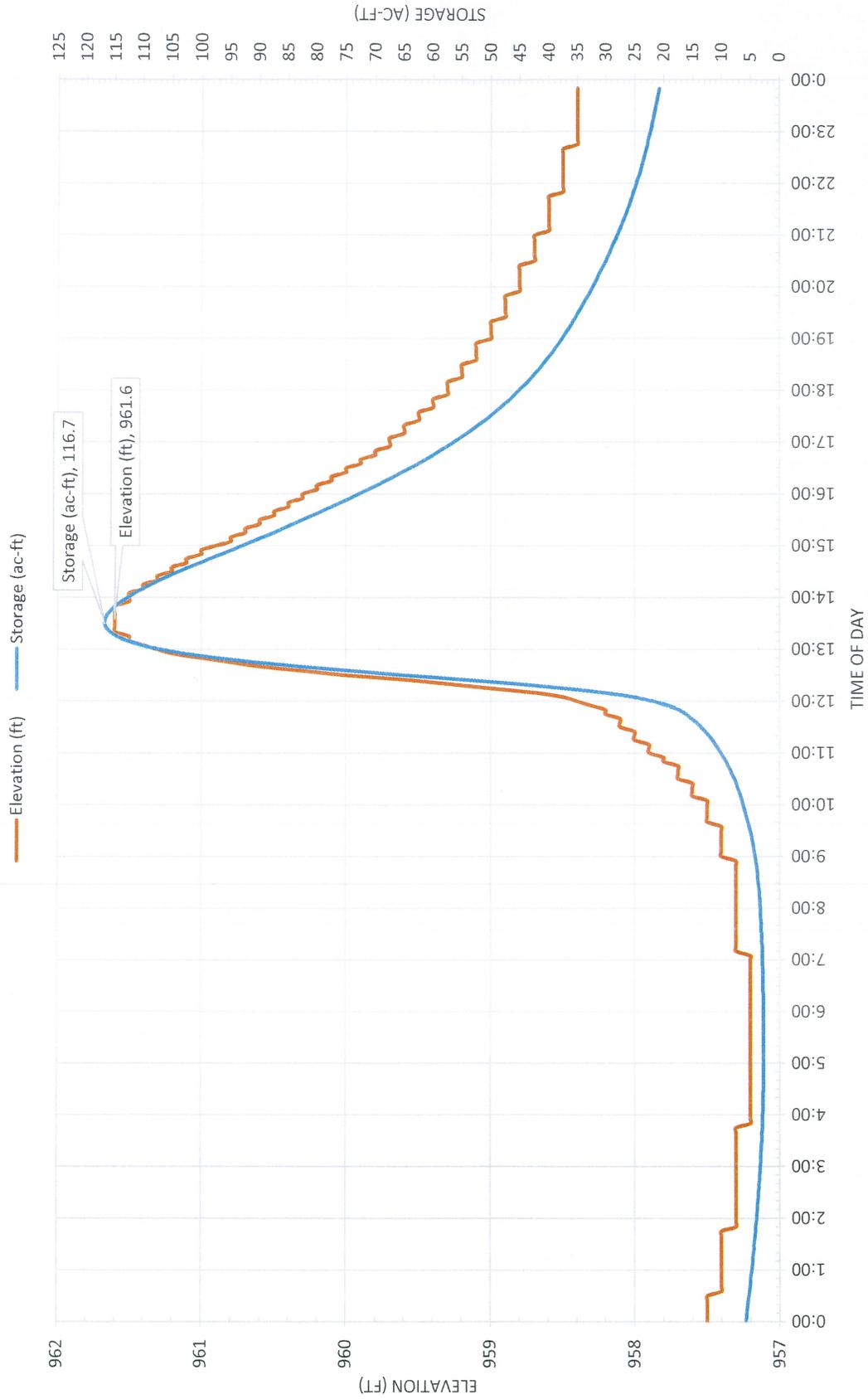
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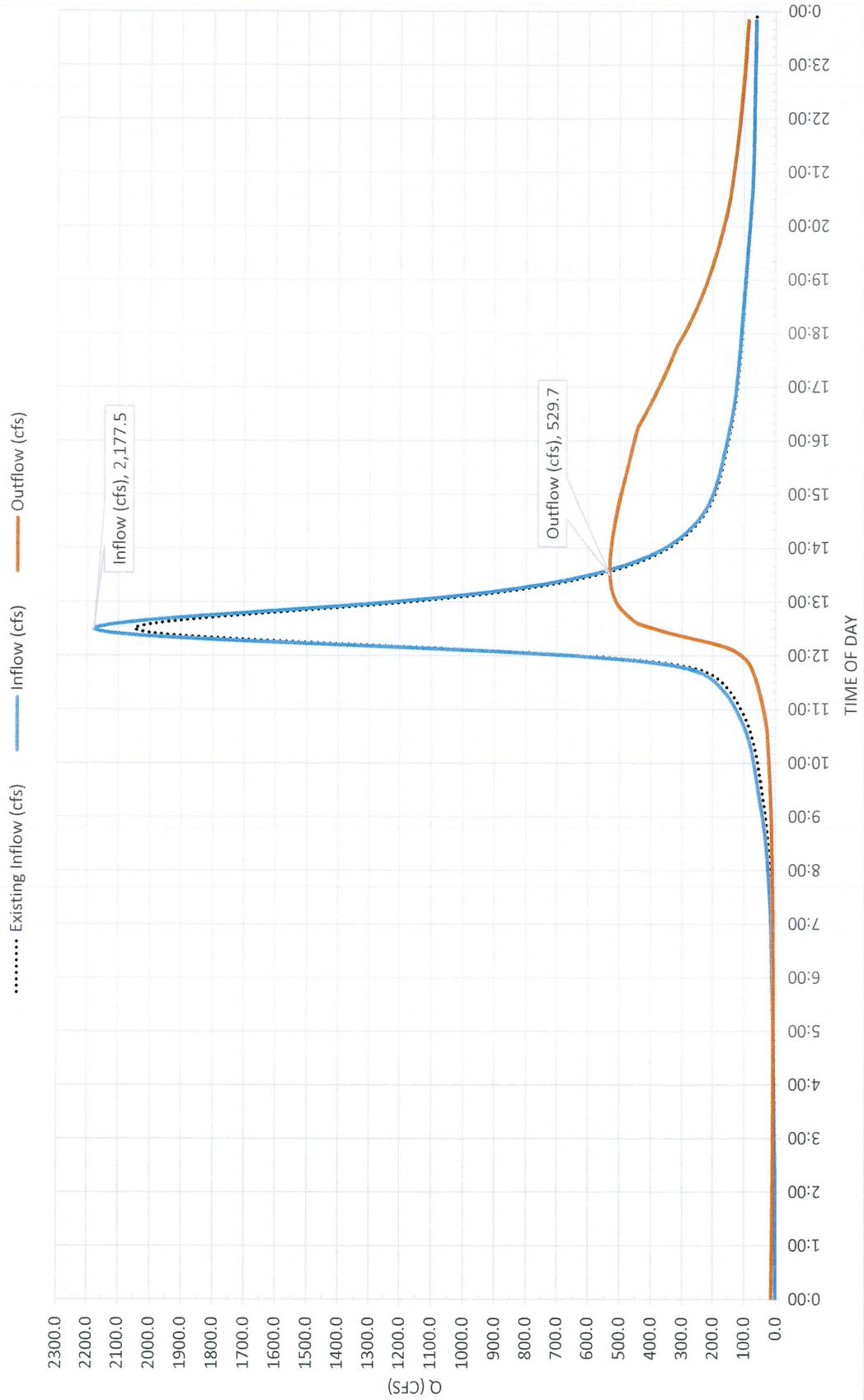
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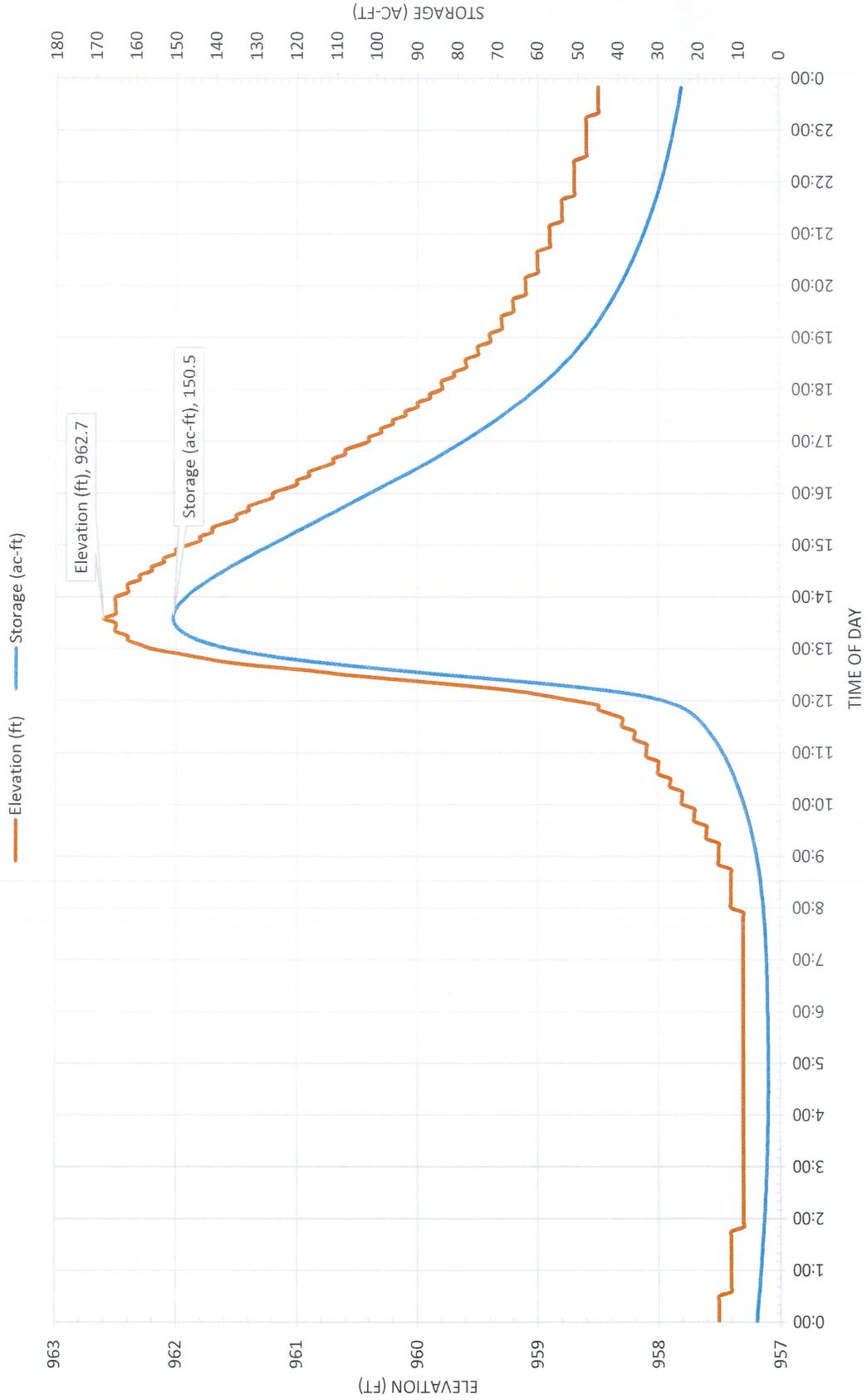
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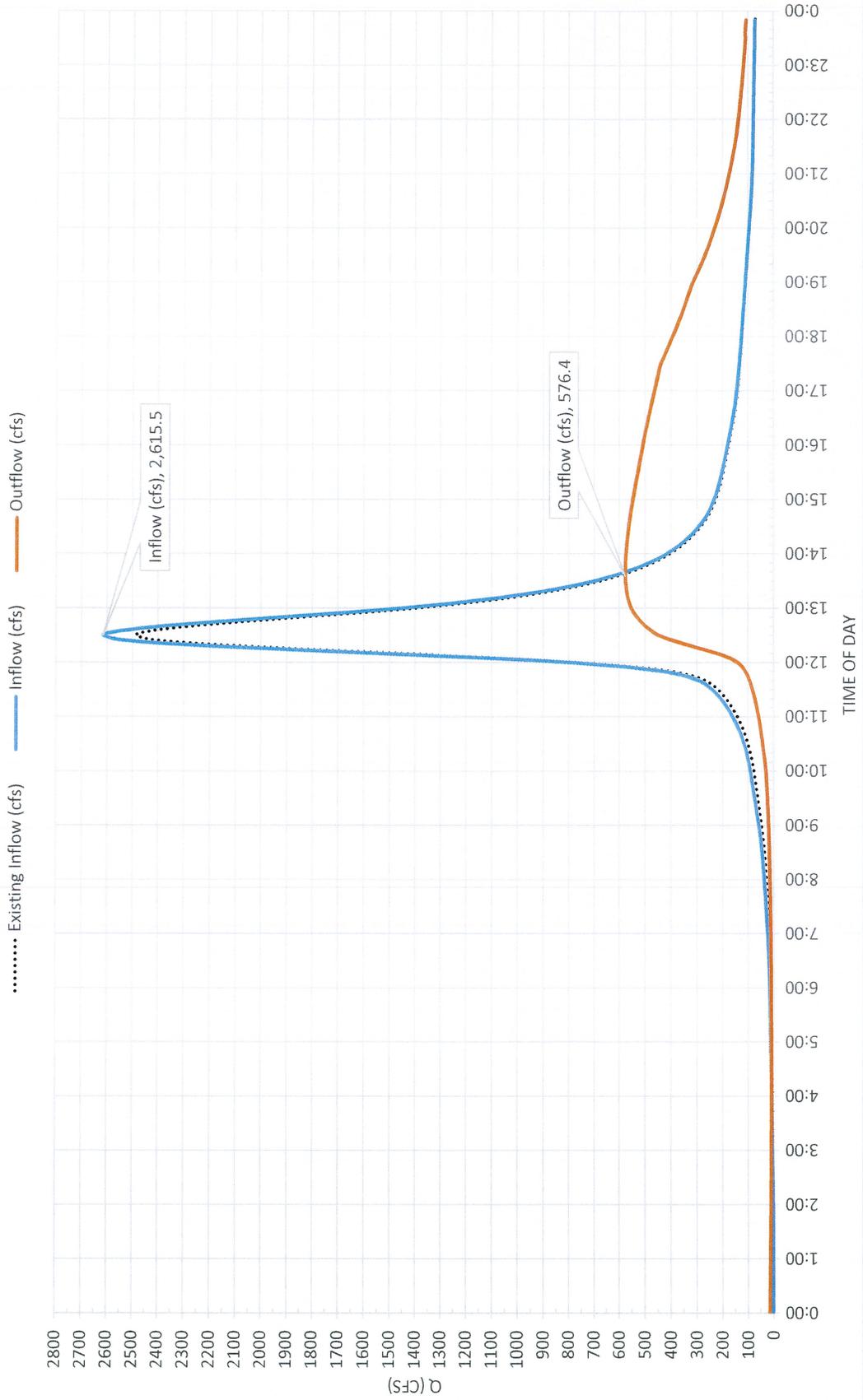
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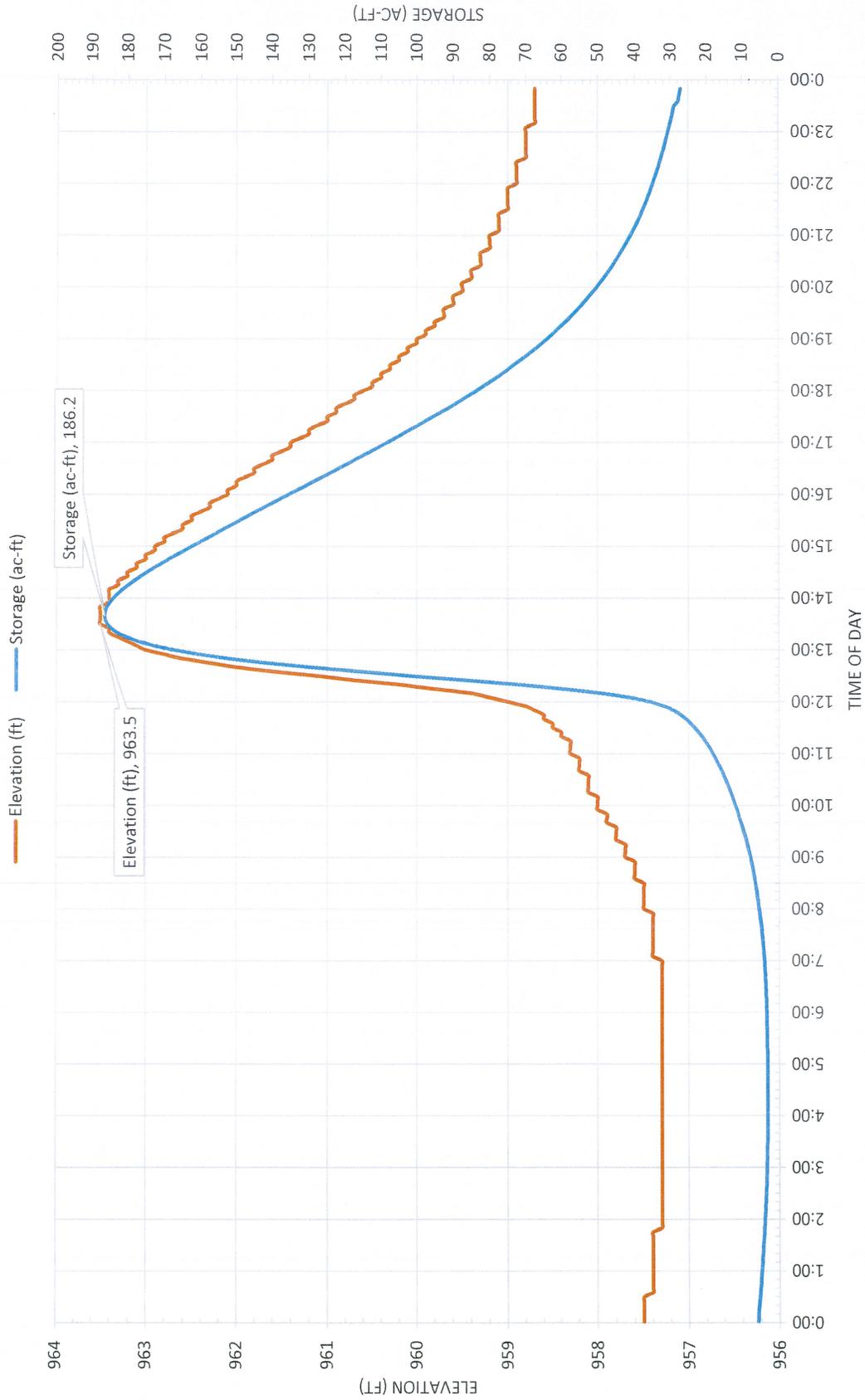
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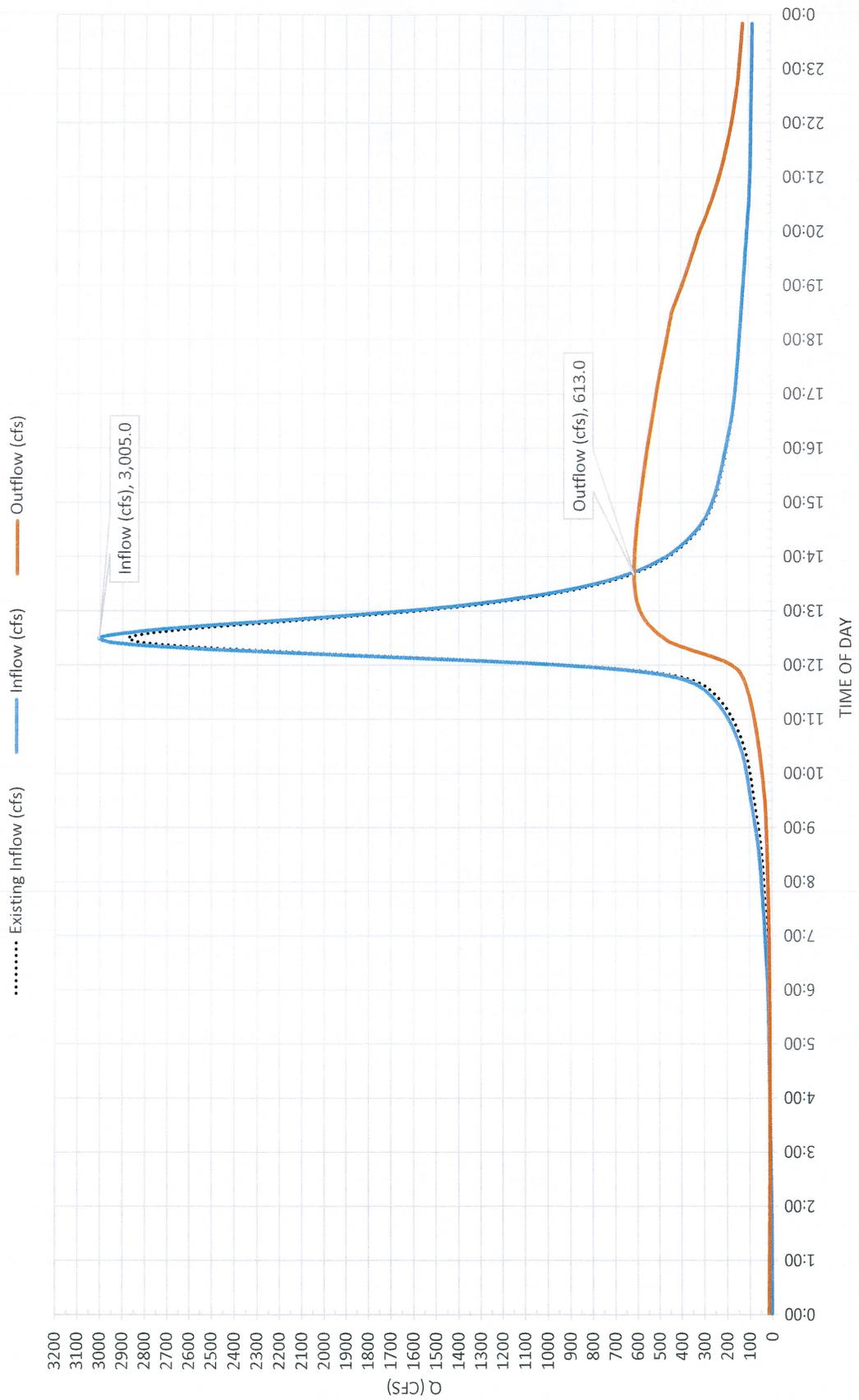
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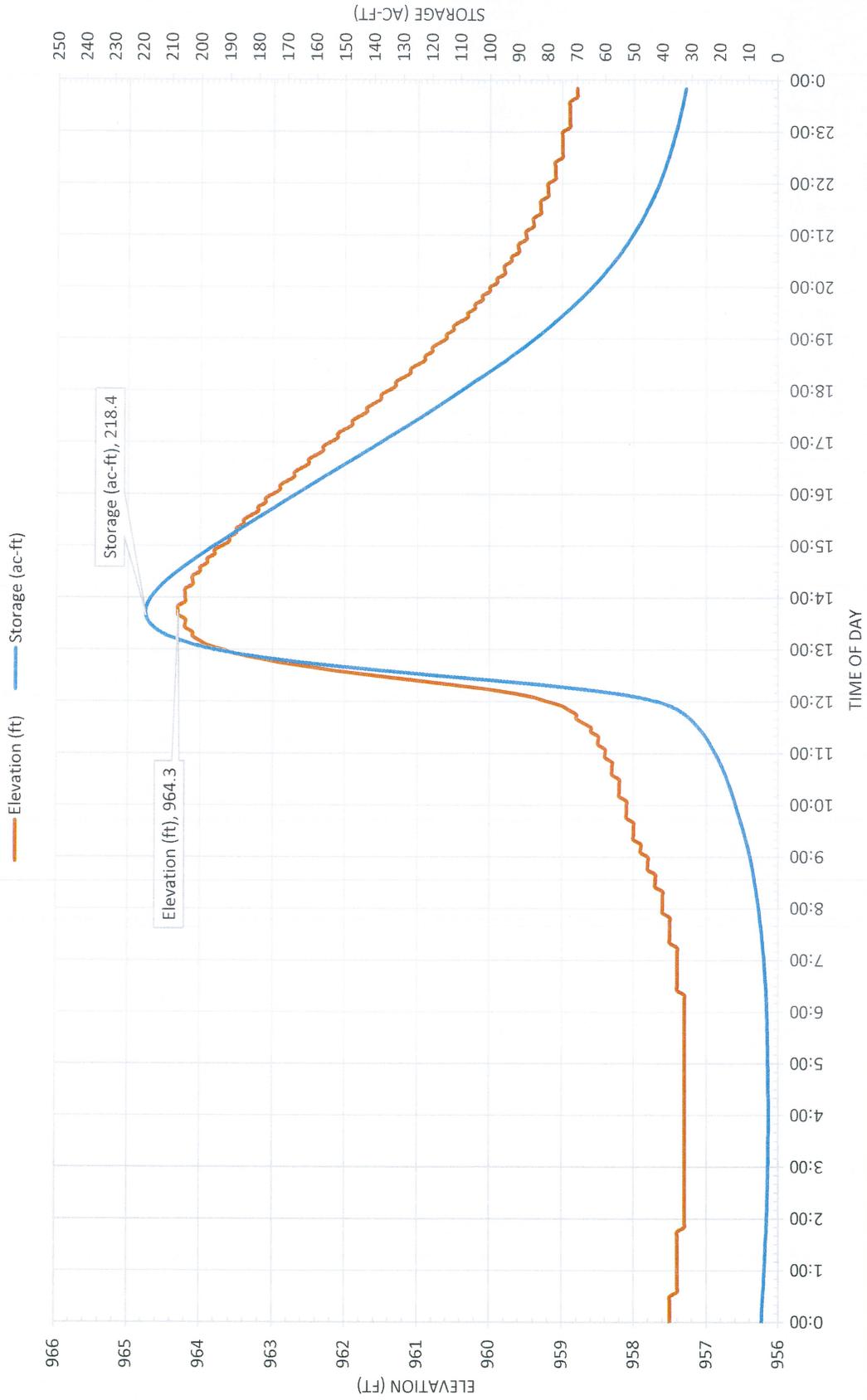
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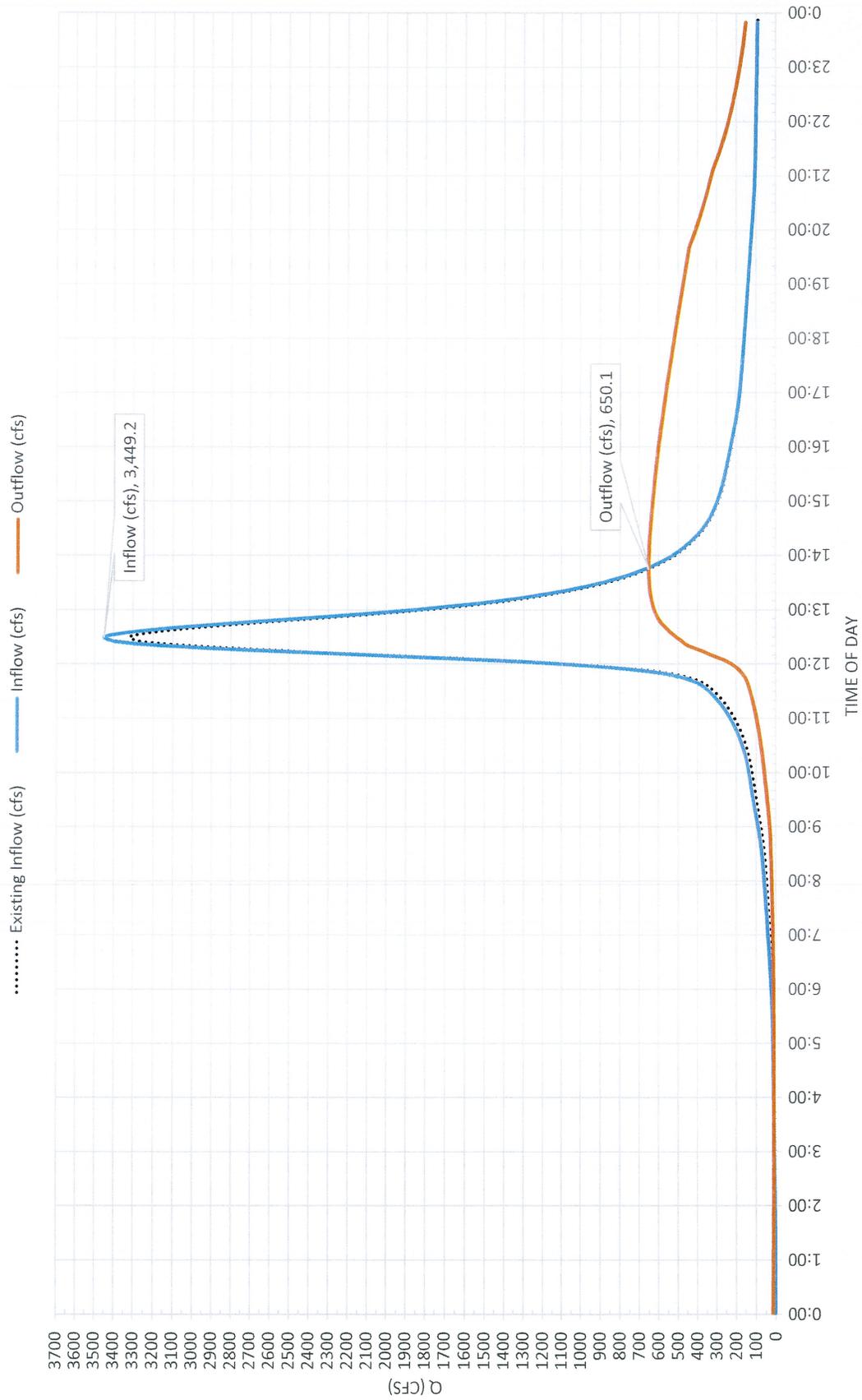
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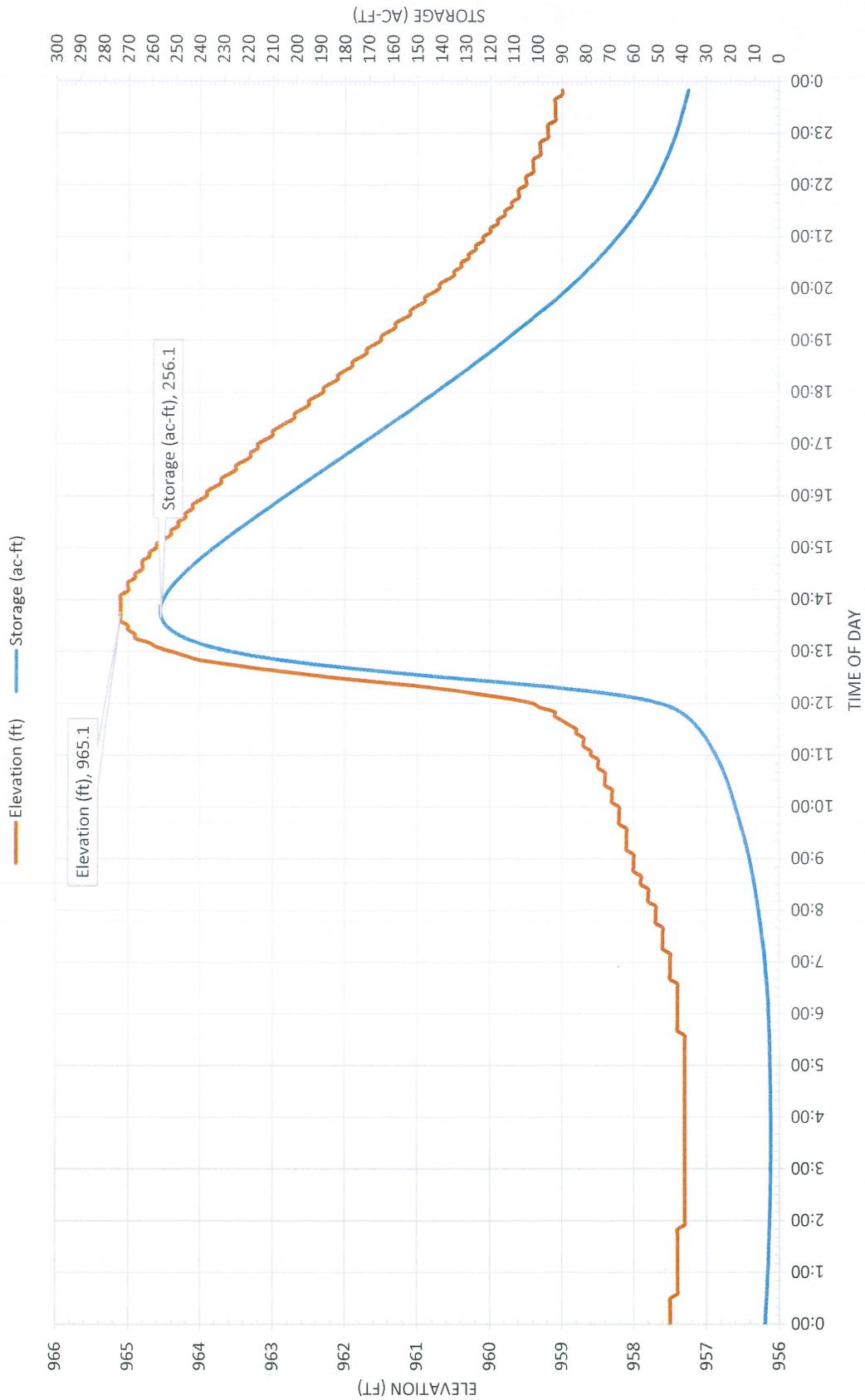
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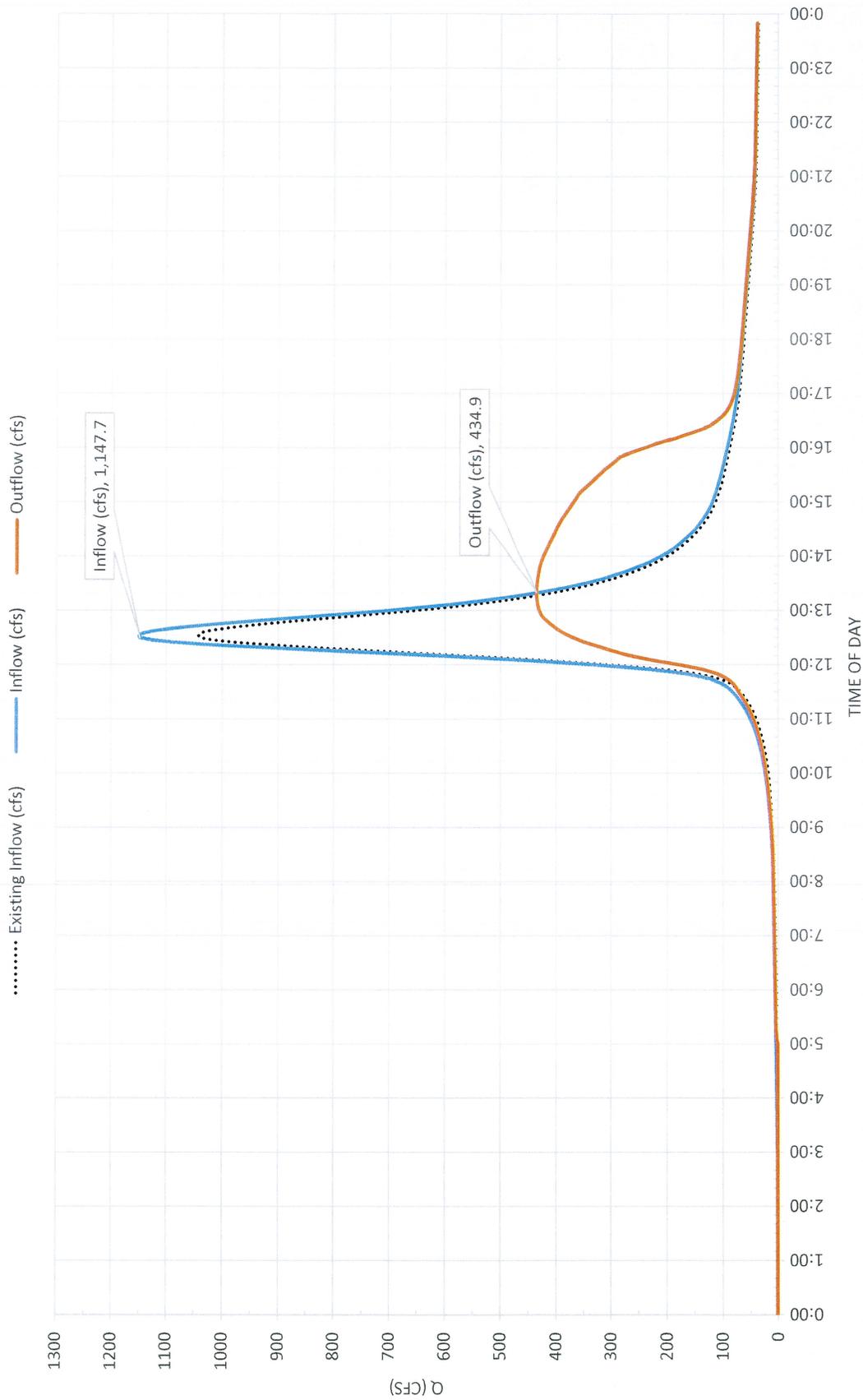
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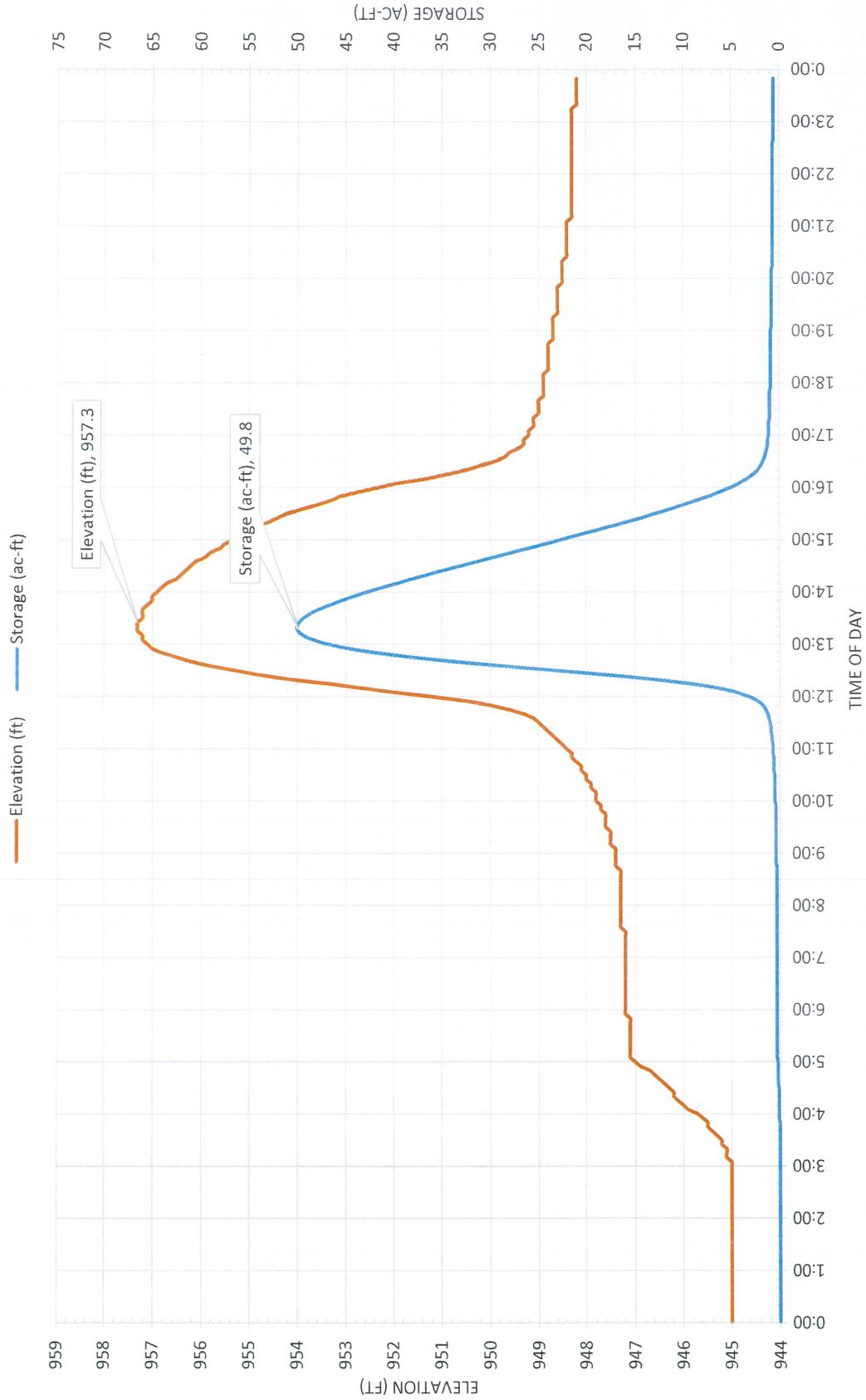
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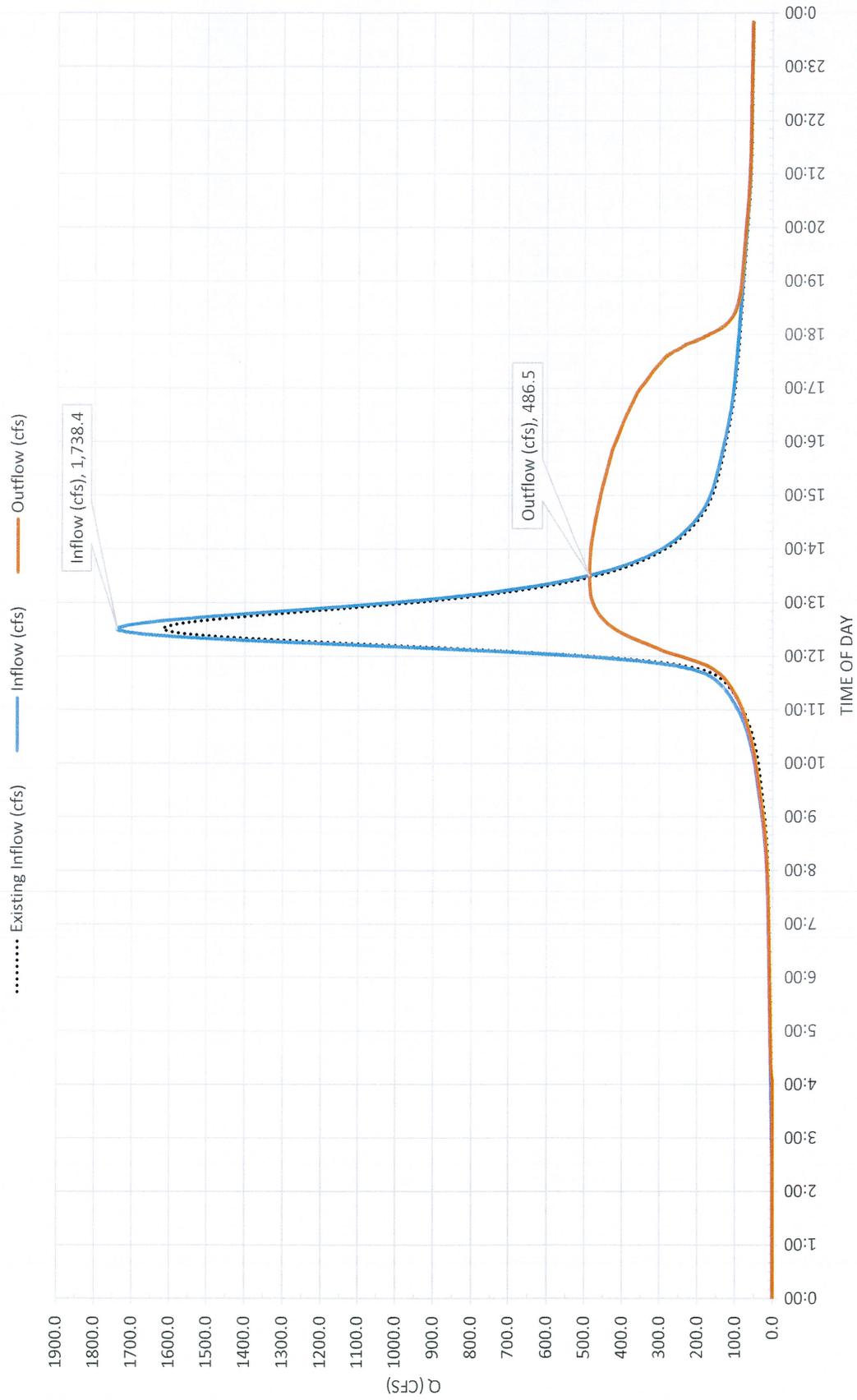
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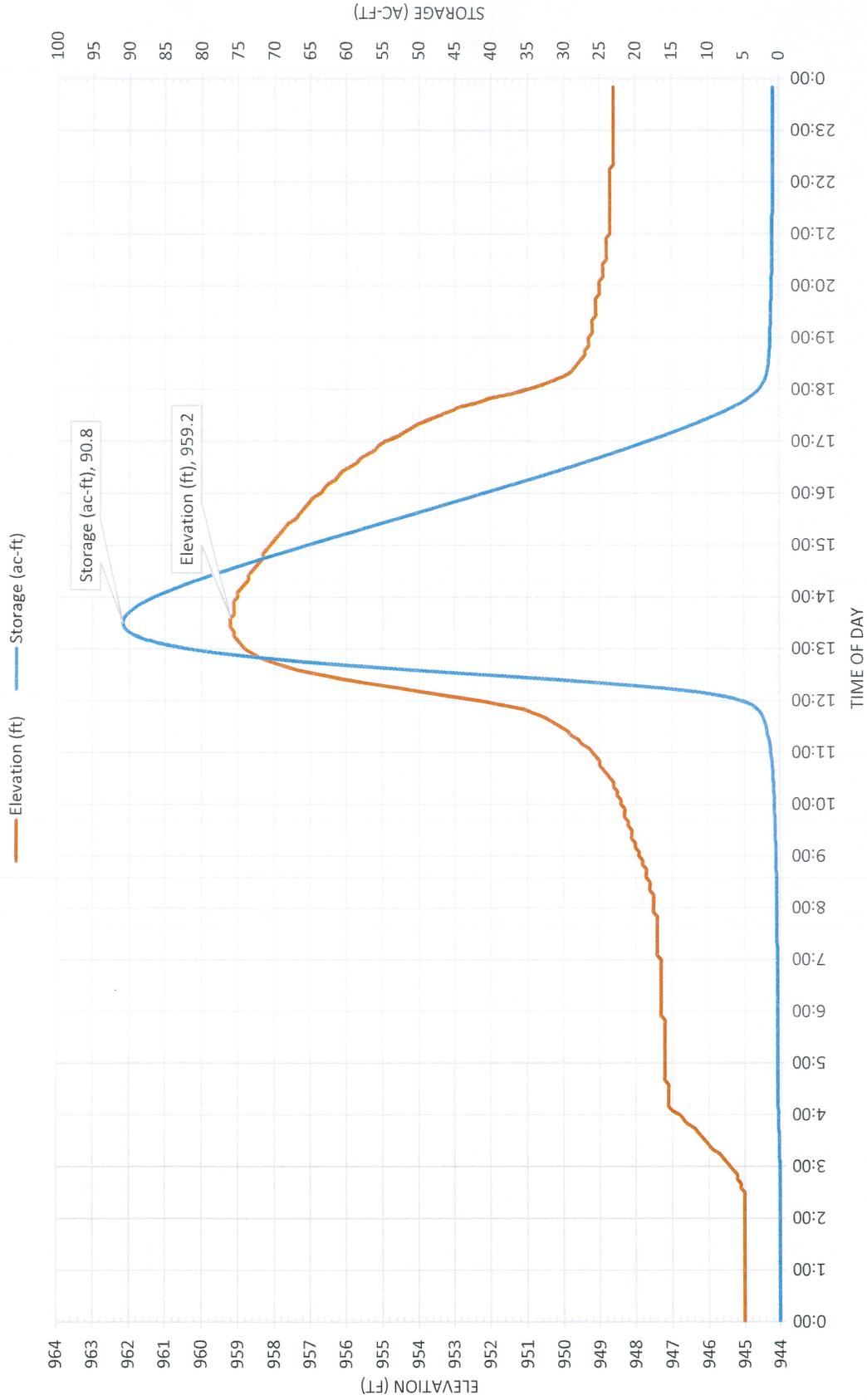
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DRY-TO-WET BASIN OPTION - PHASE 1 5-YEAR STORM EVENT WITH FUTURE CID LAND USE



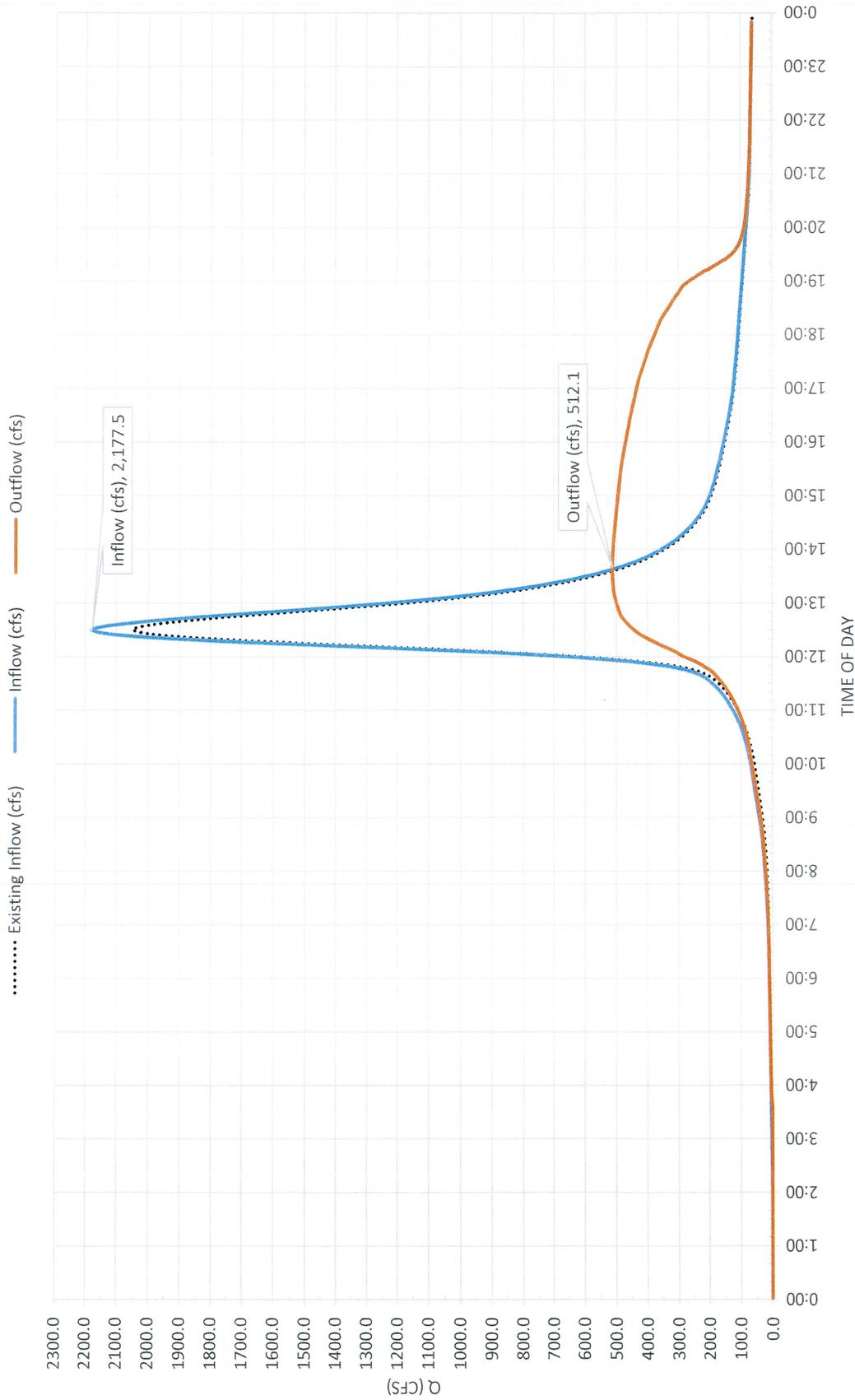
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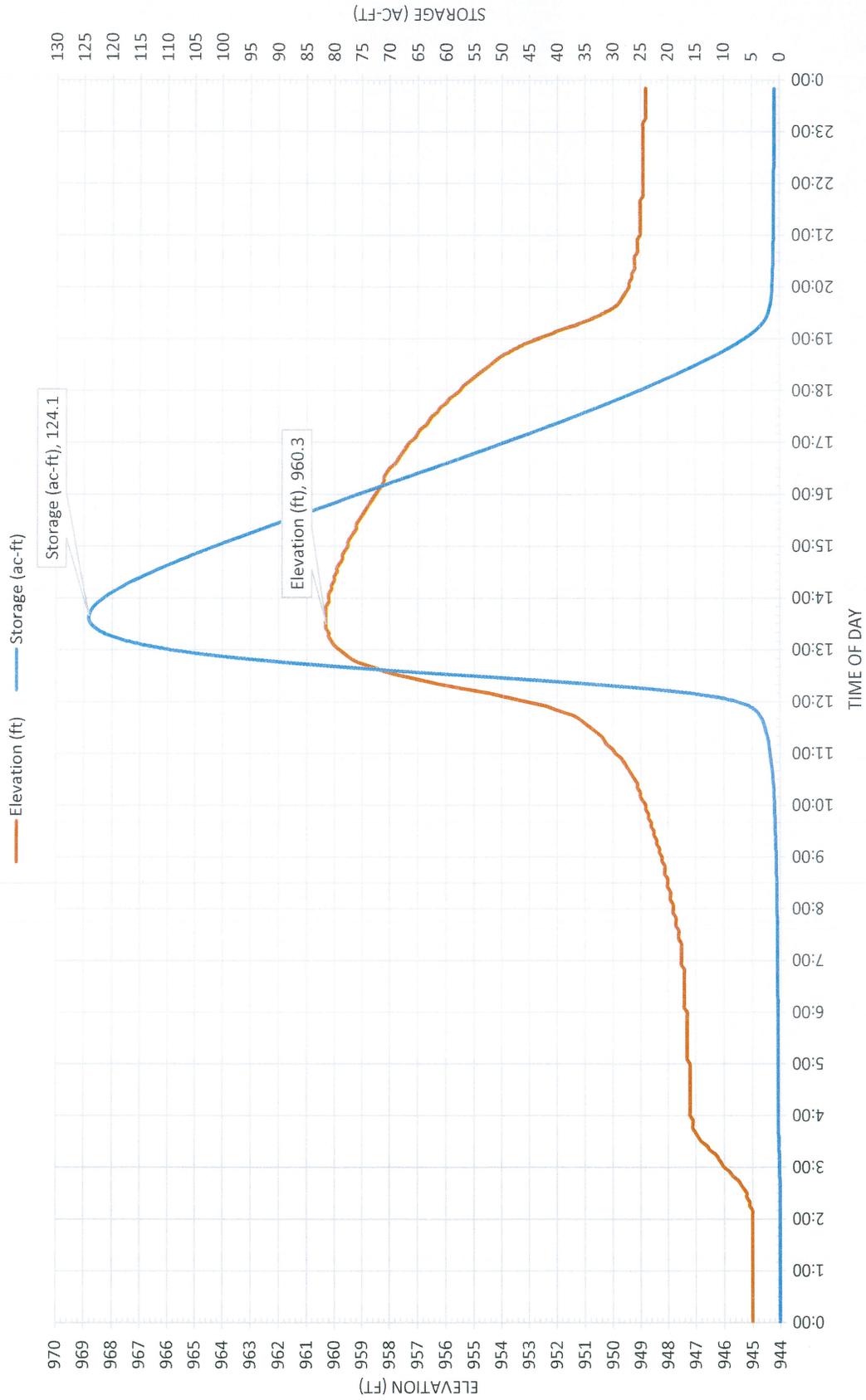
DRY-TO-WET BASIN OPTION - PHASE 1

10-YEAR STORM EVENT

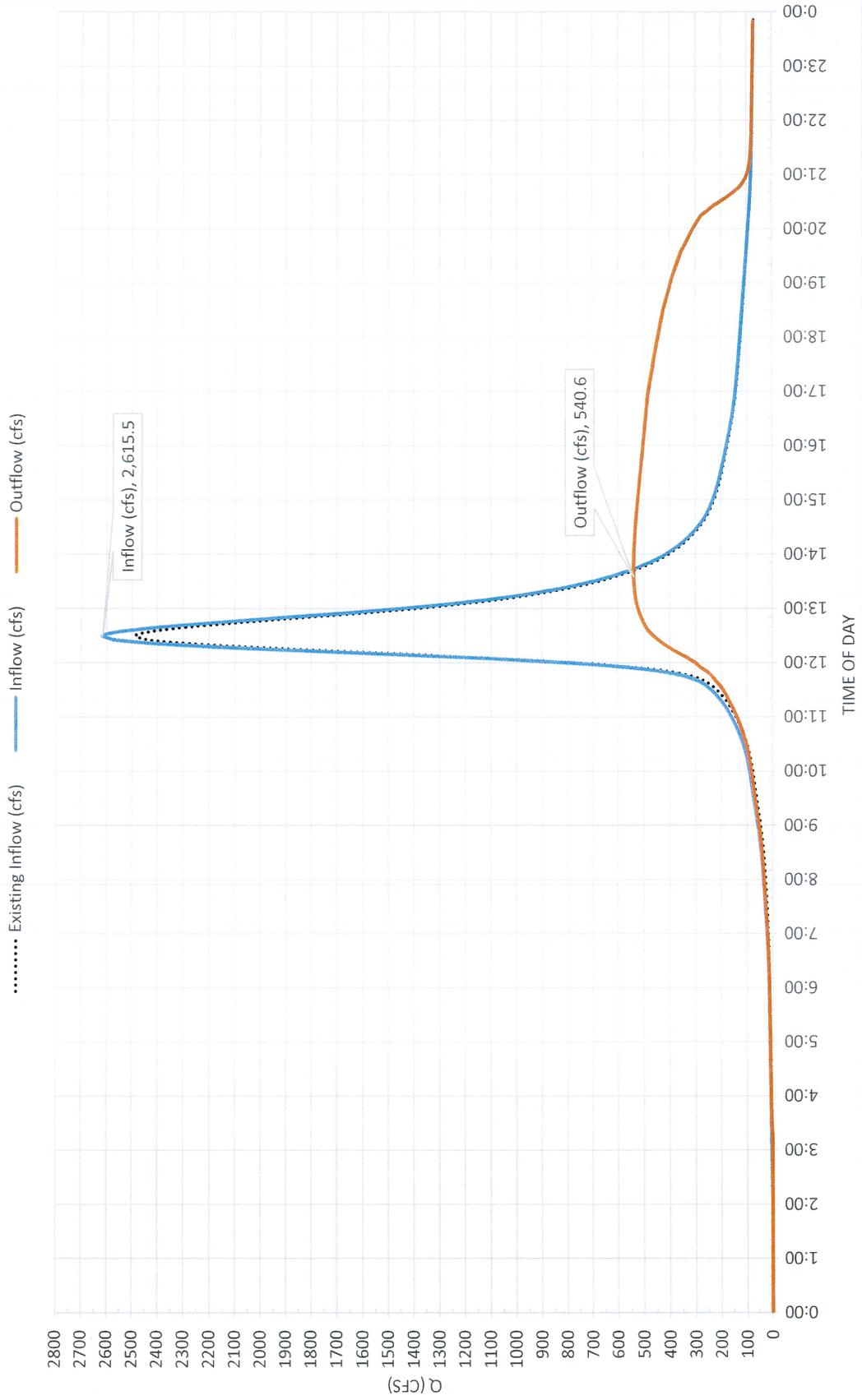
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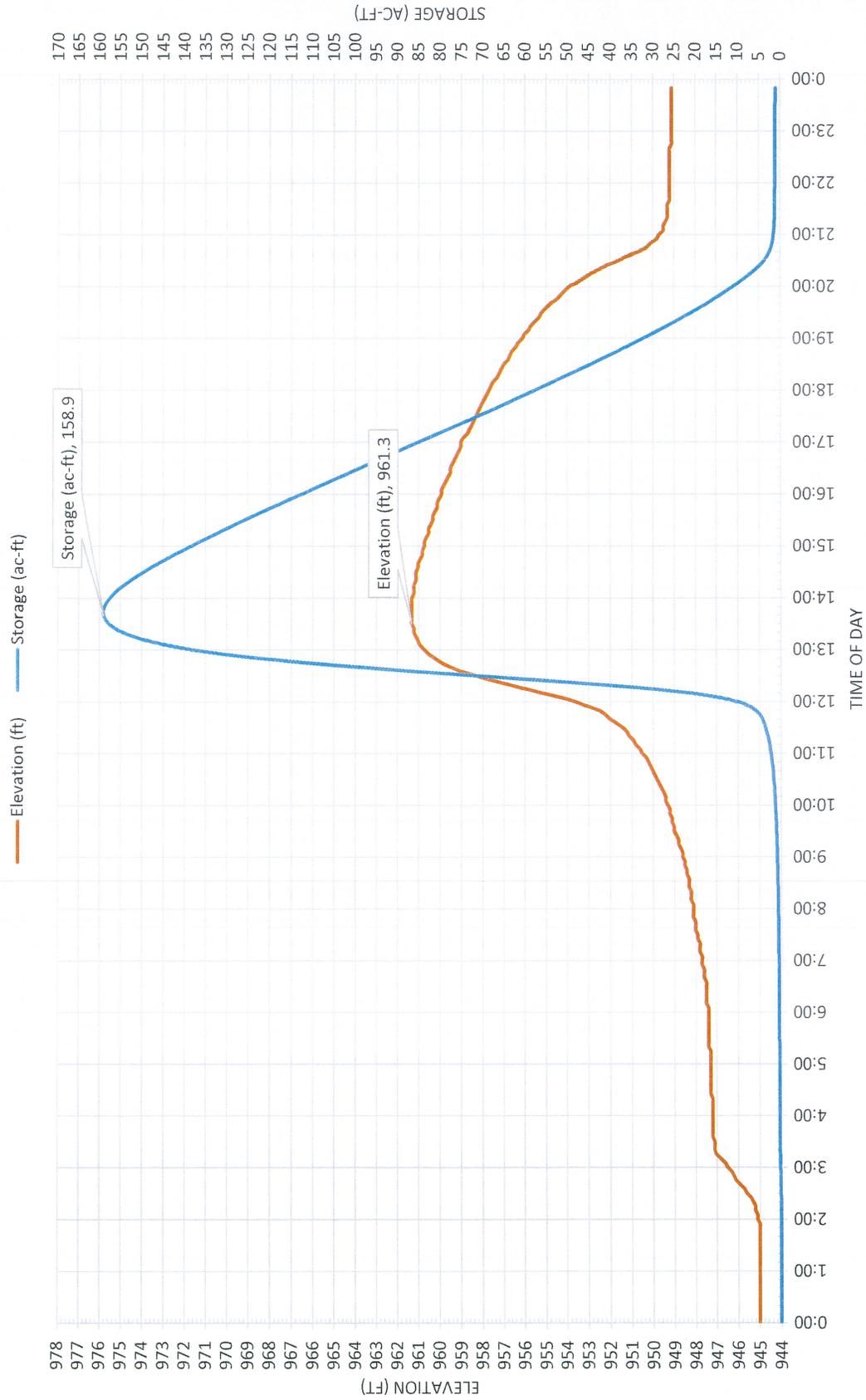
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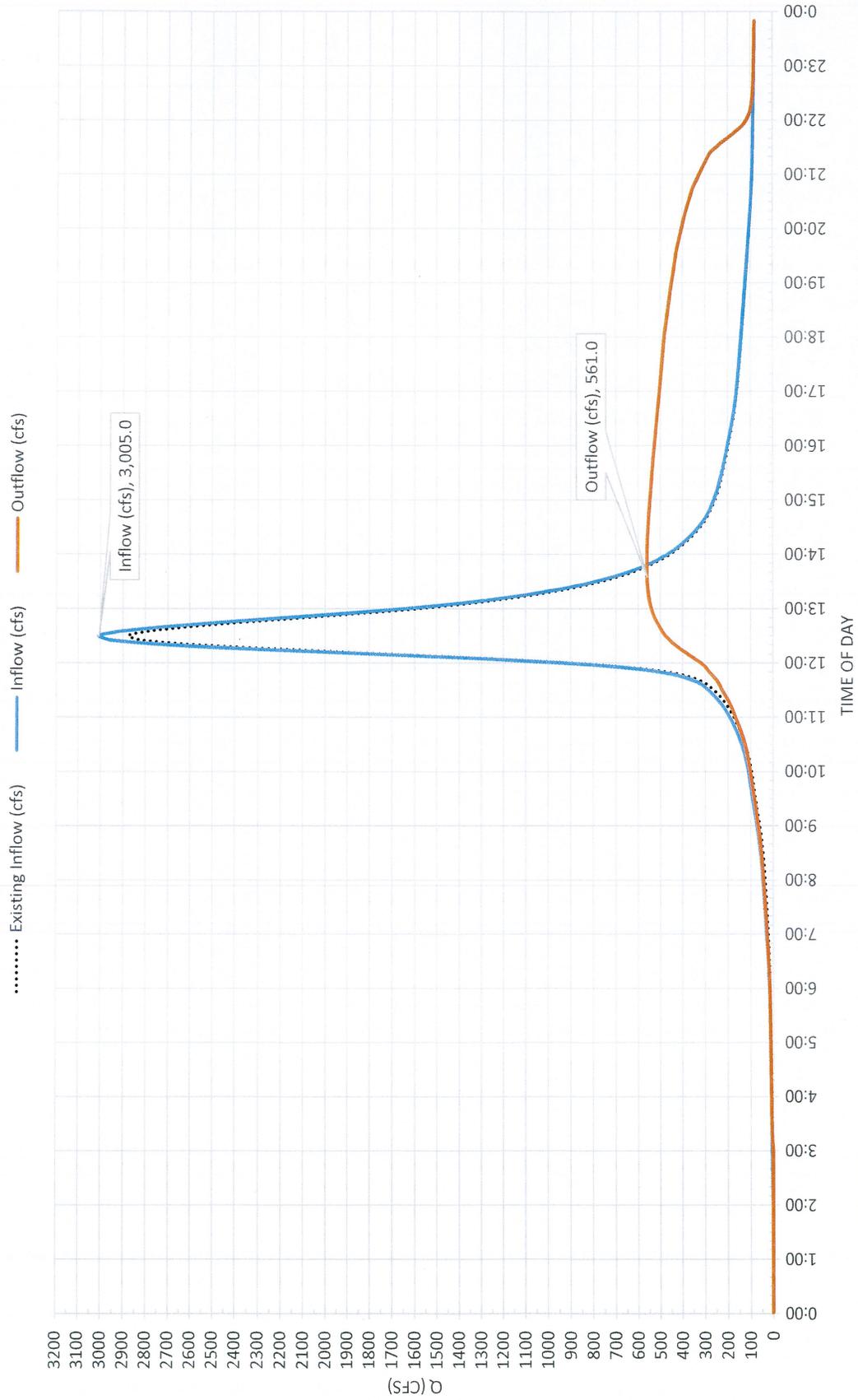
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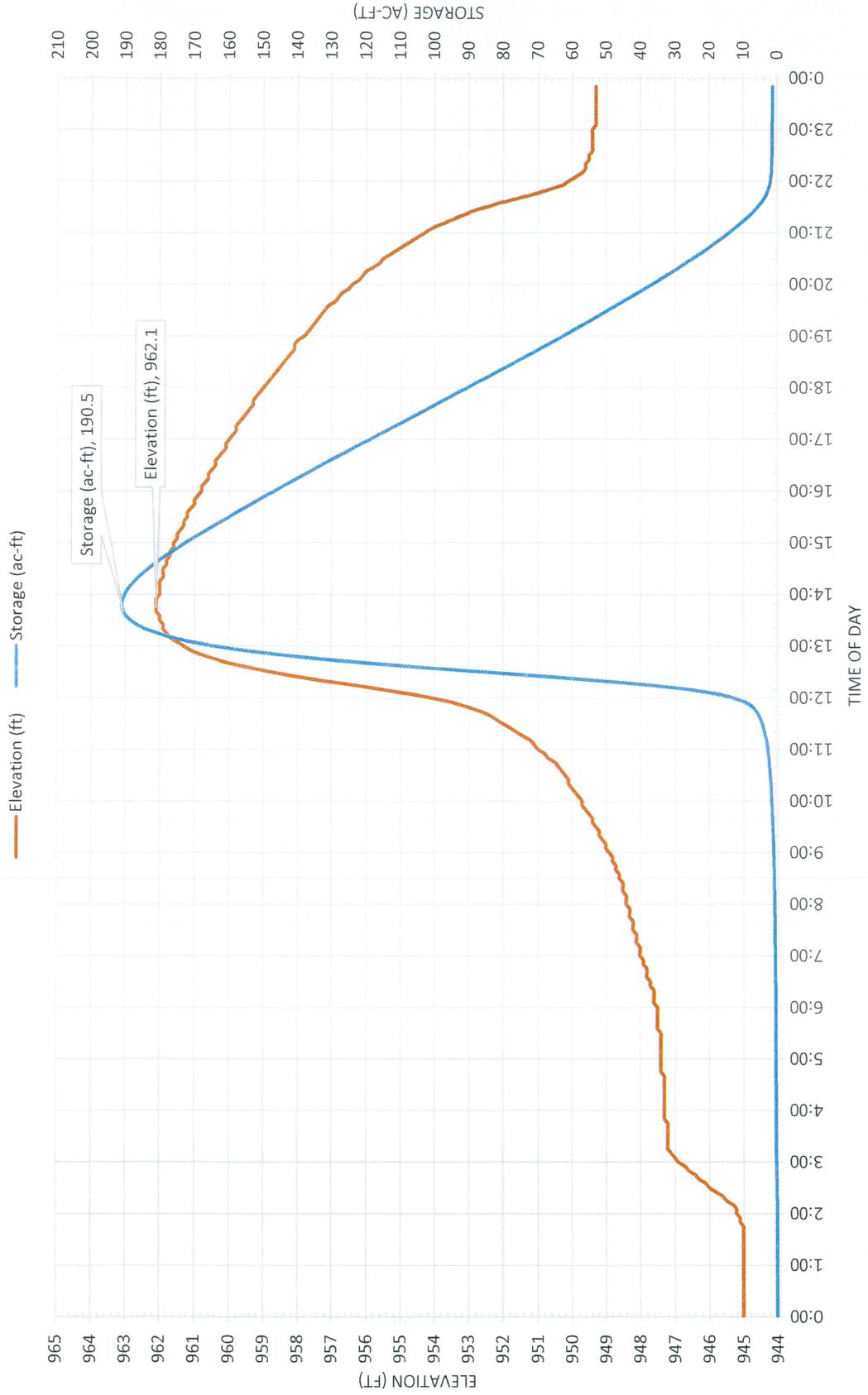
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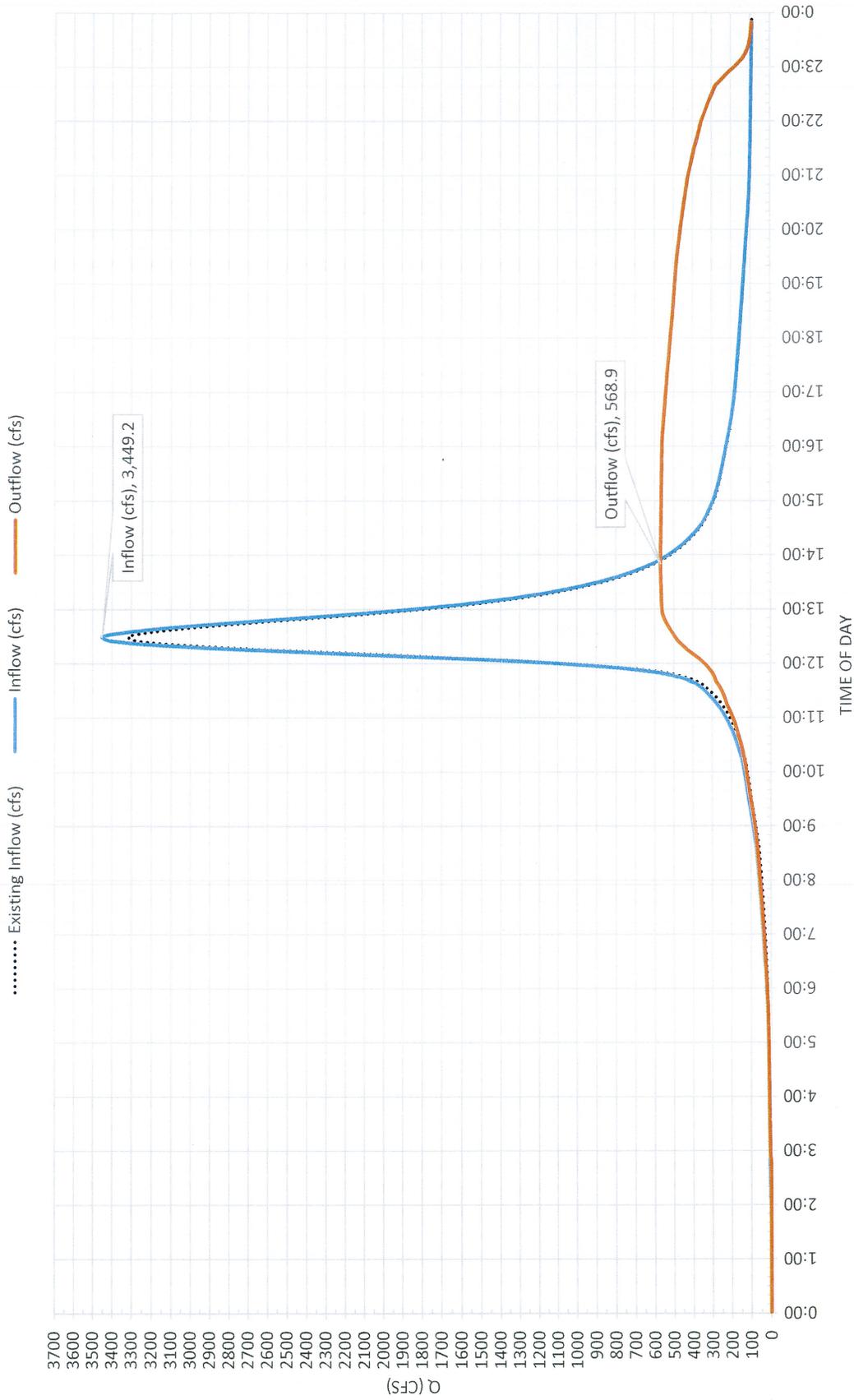
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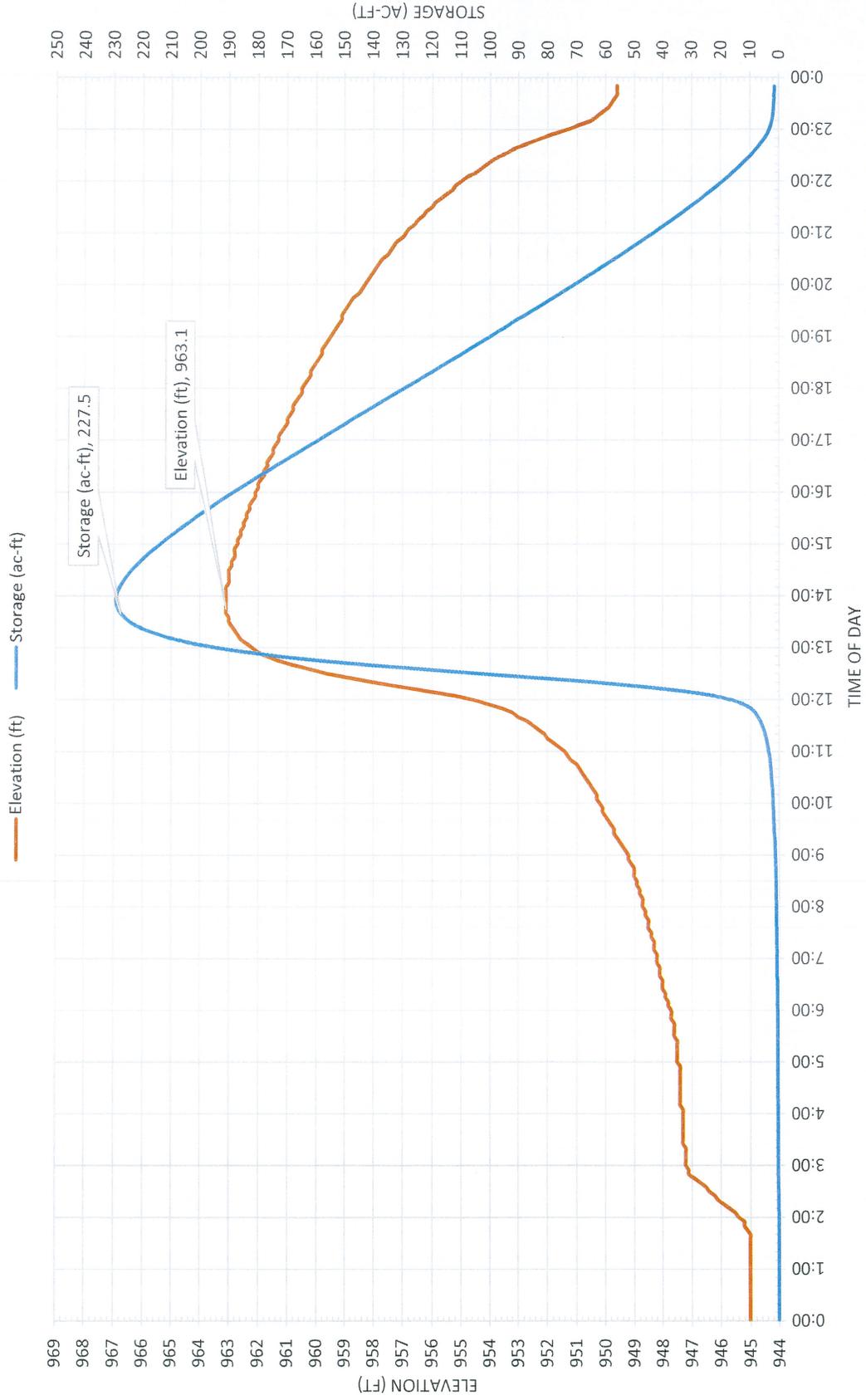
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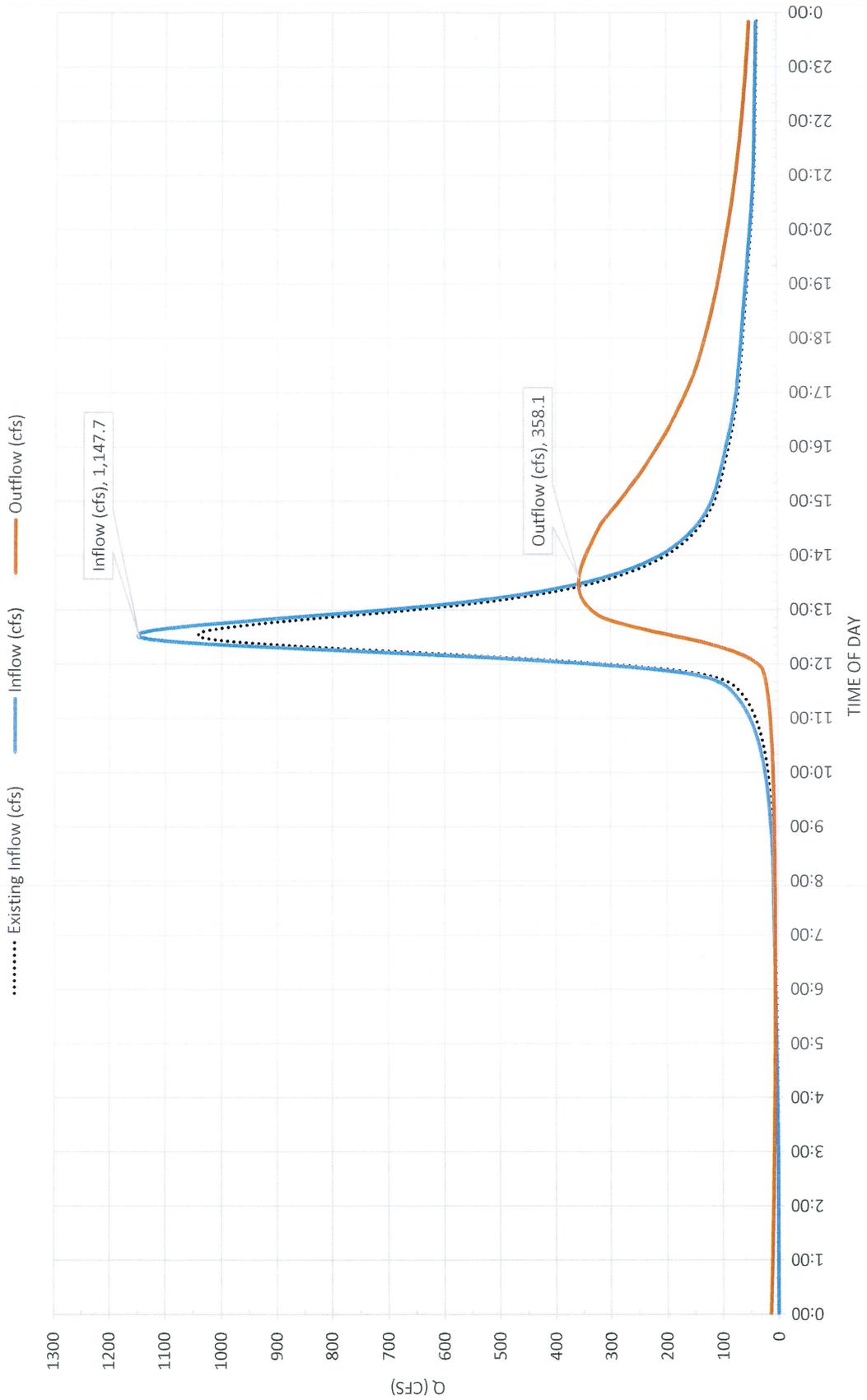
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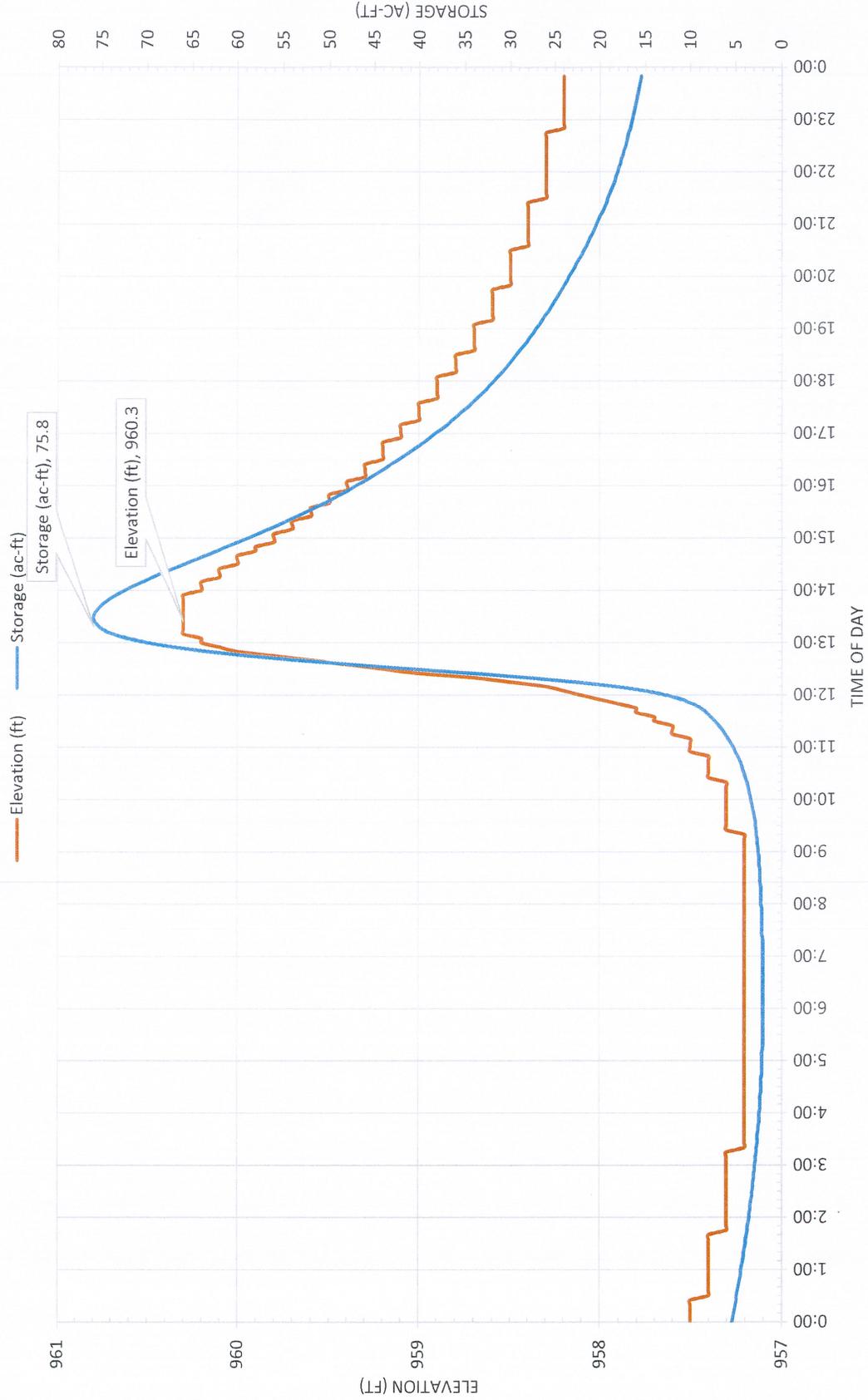
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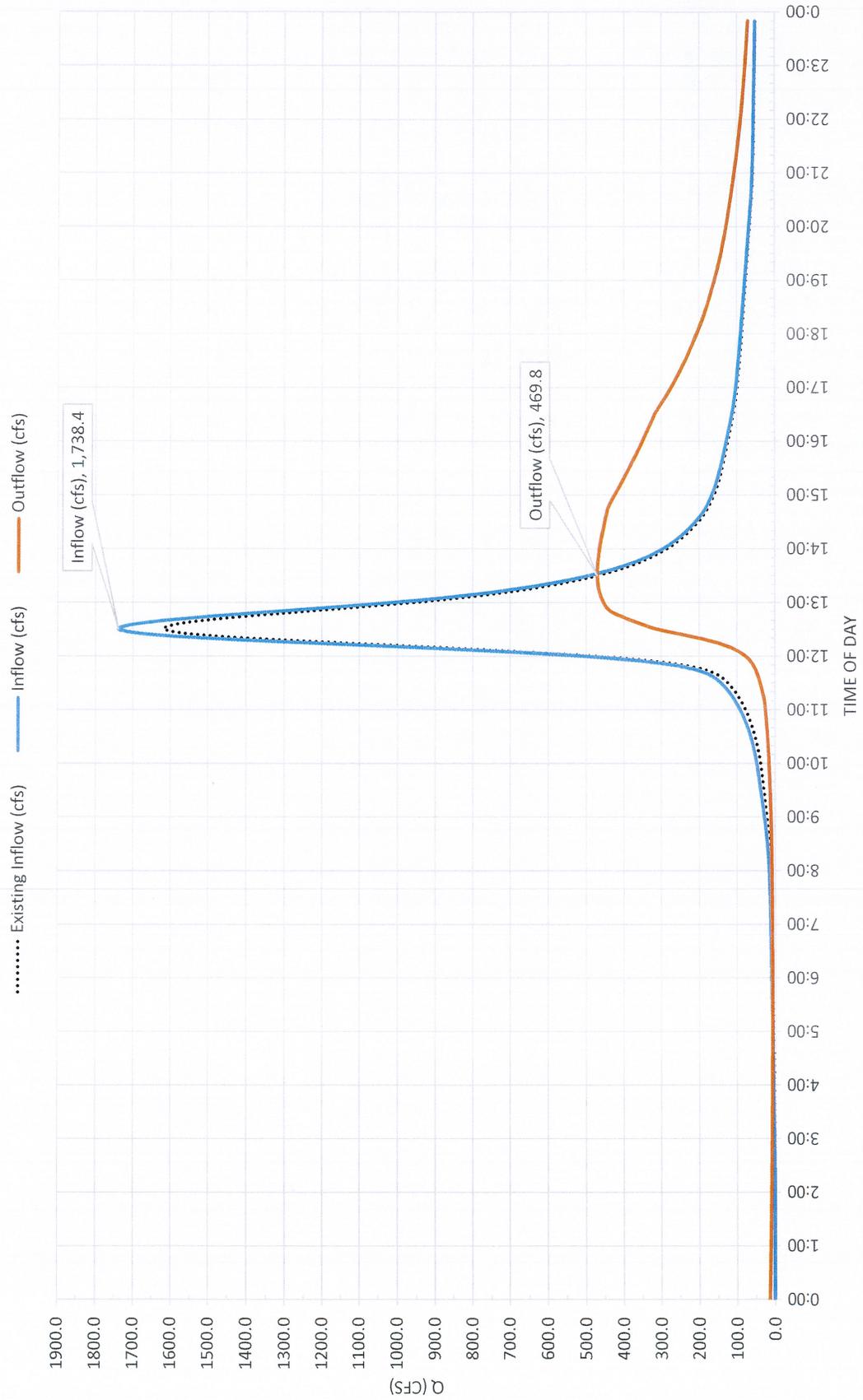
**DRY-TO-WET BASIN OPTION - PHASE 2
2-YEAR STORM EVENT
WITH FUTURE CID LAND USE**



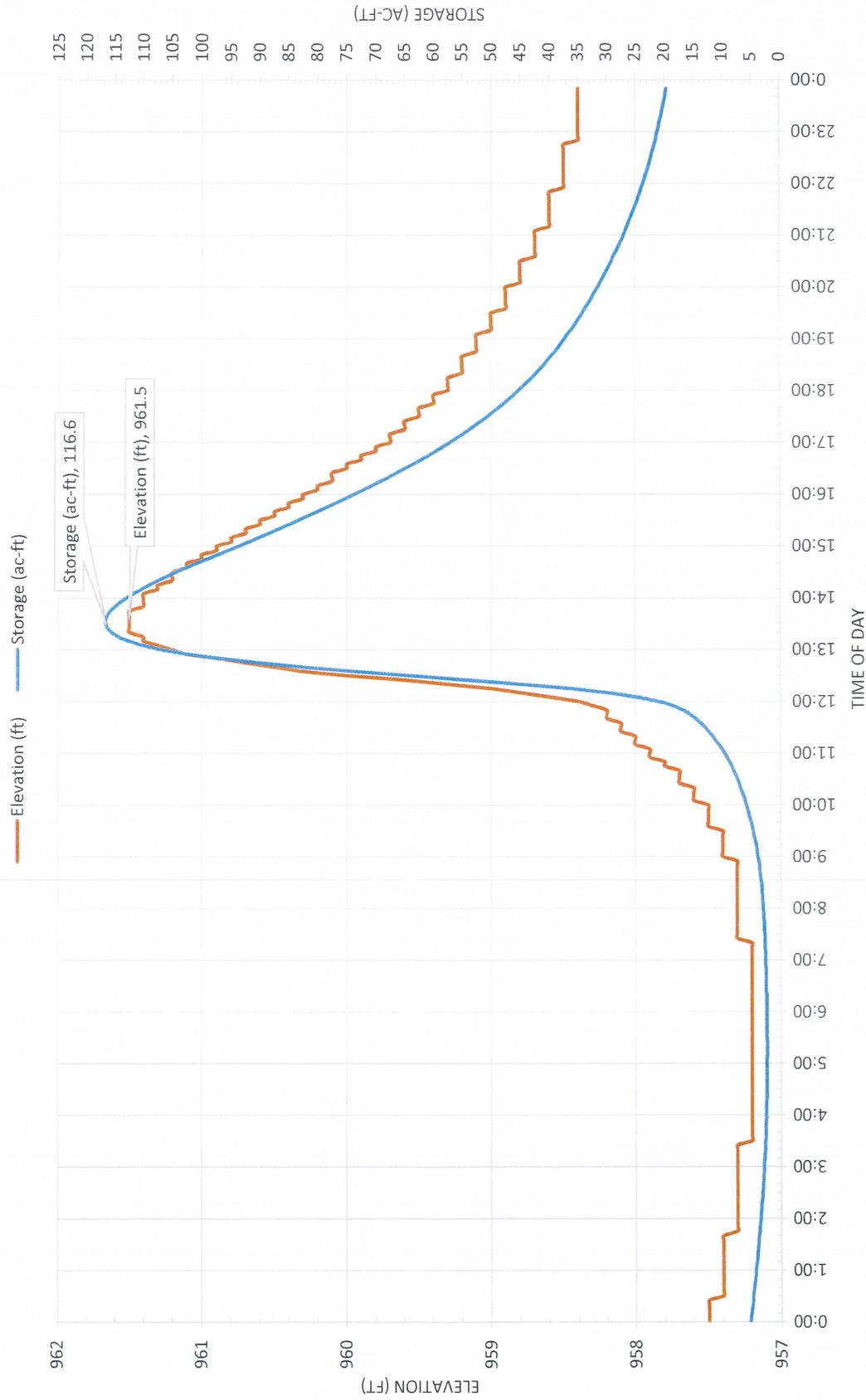
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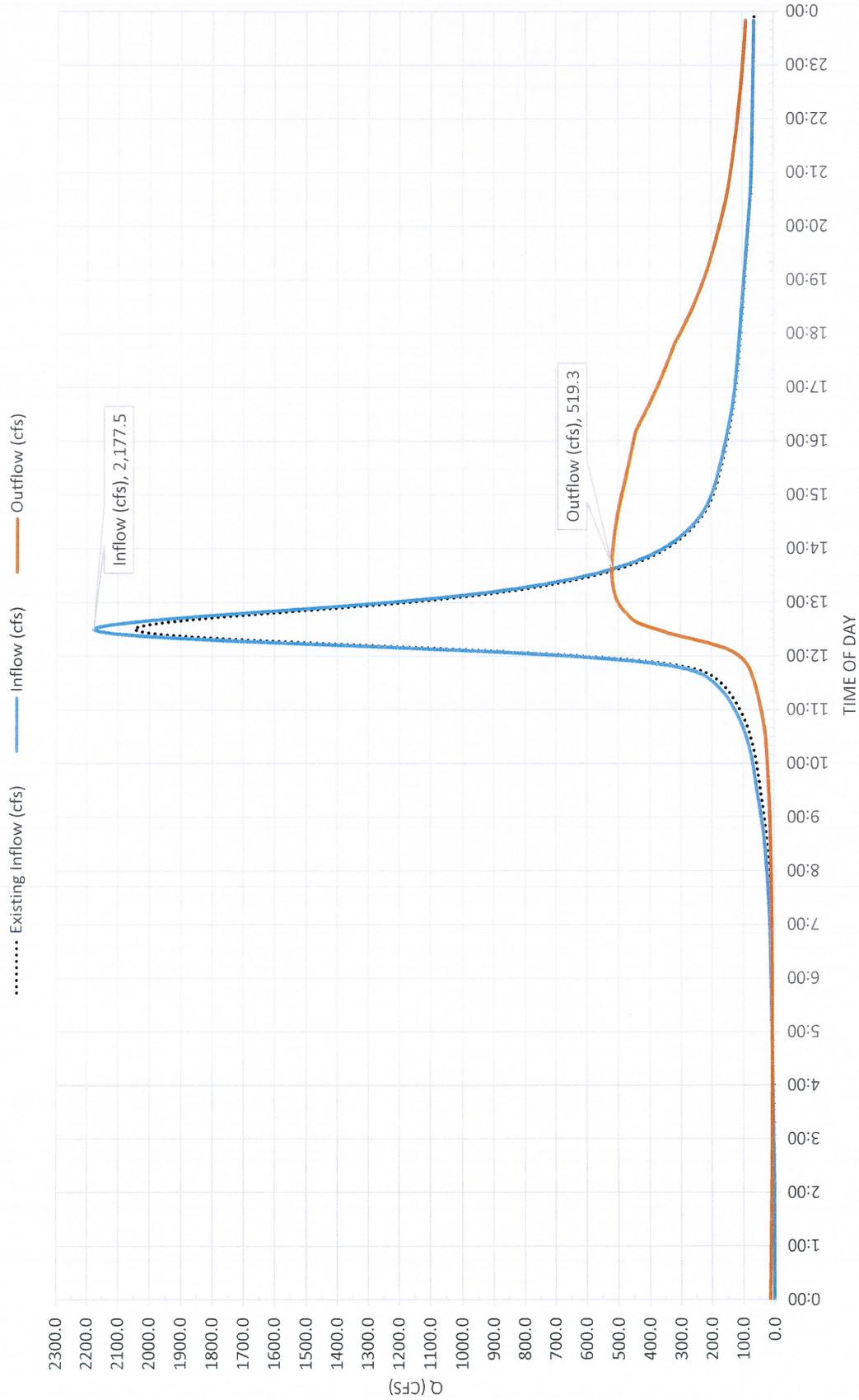
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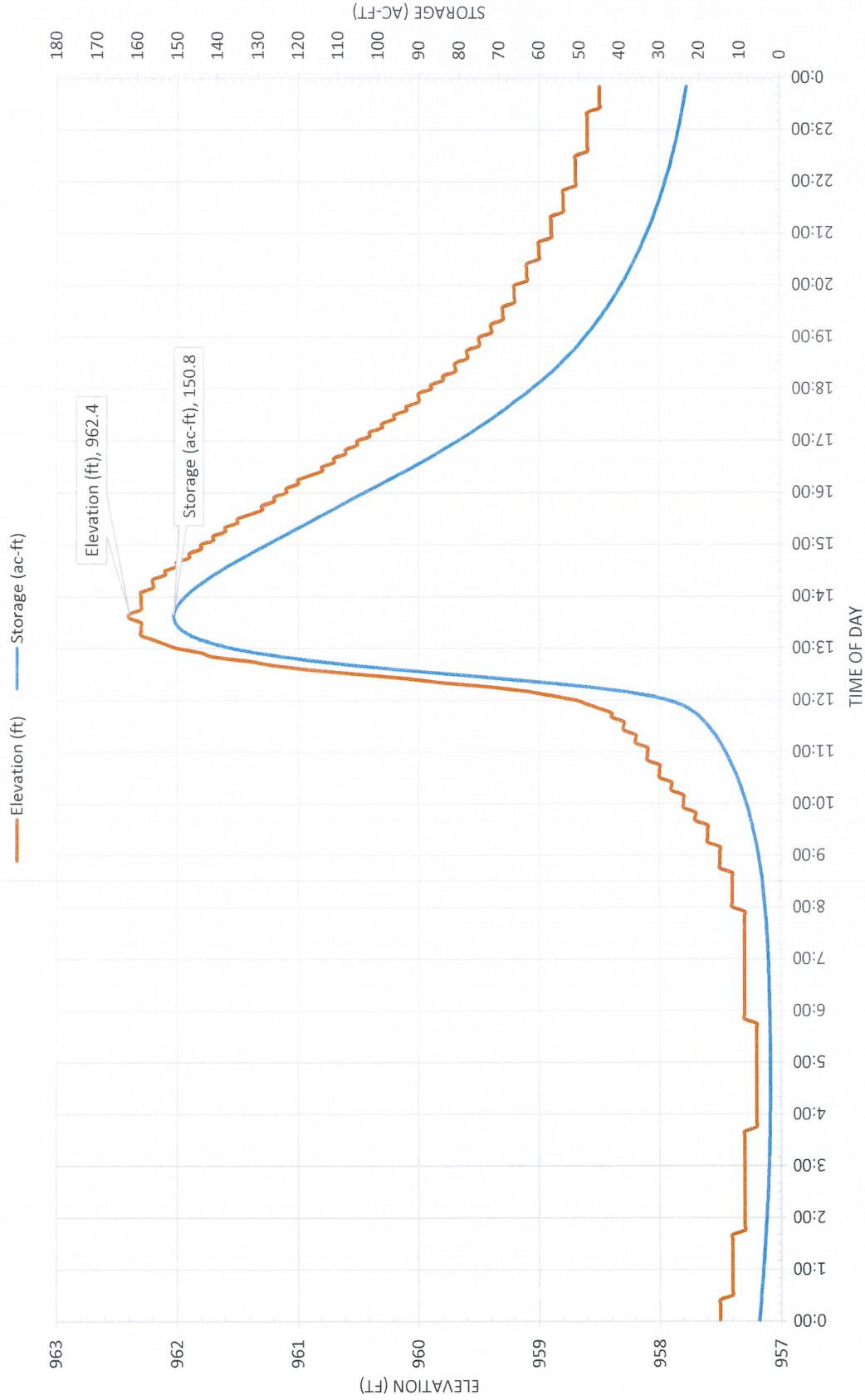
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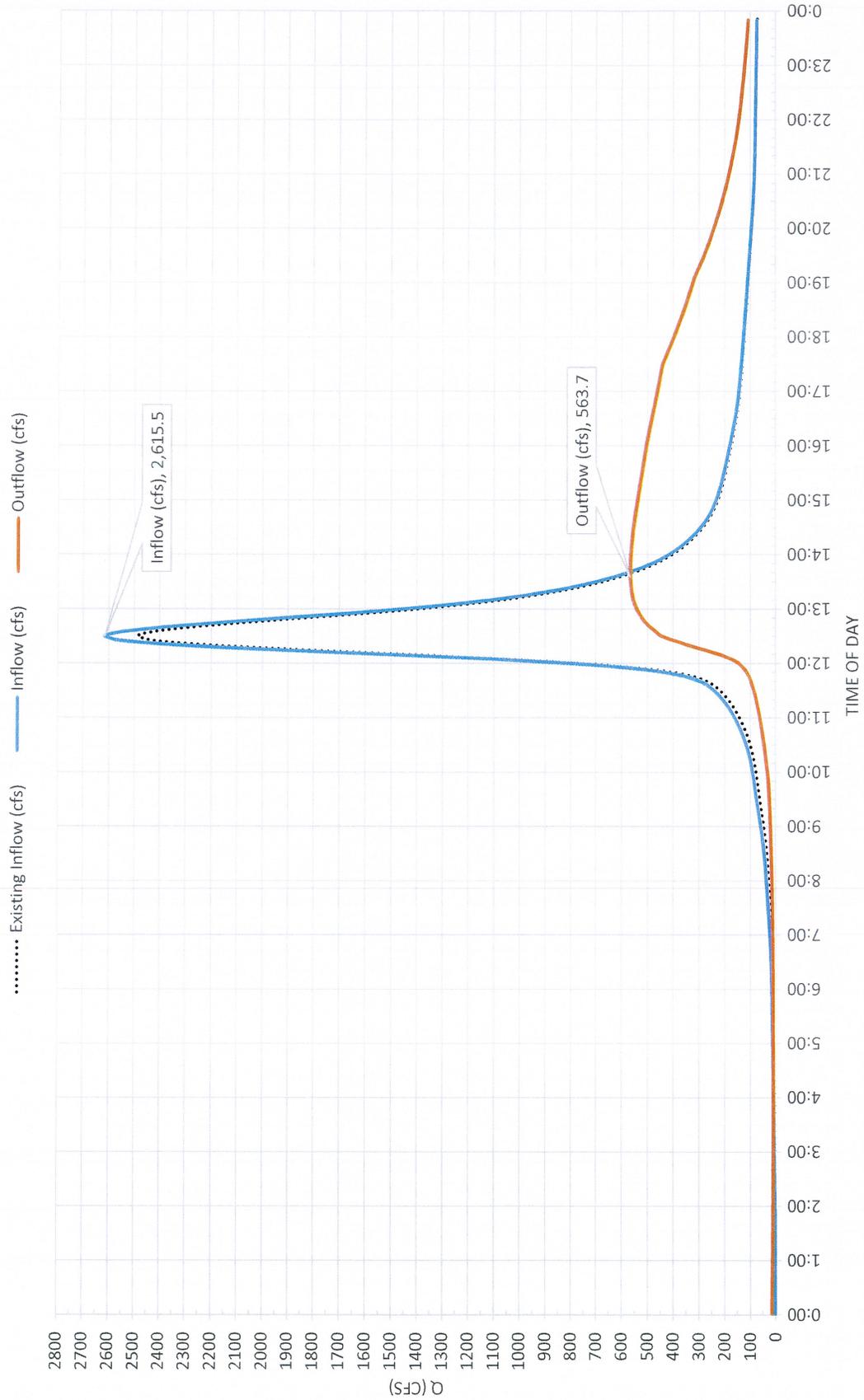
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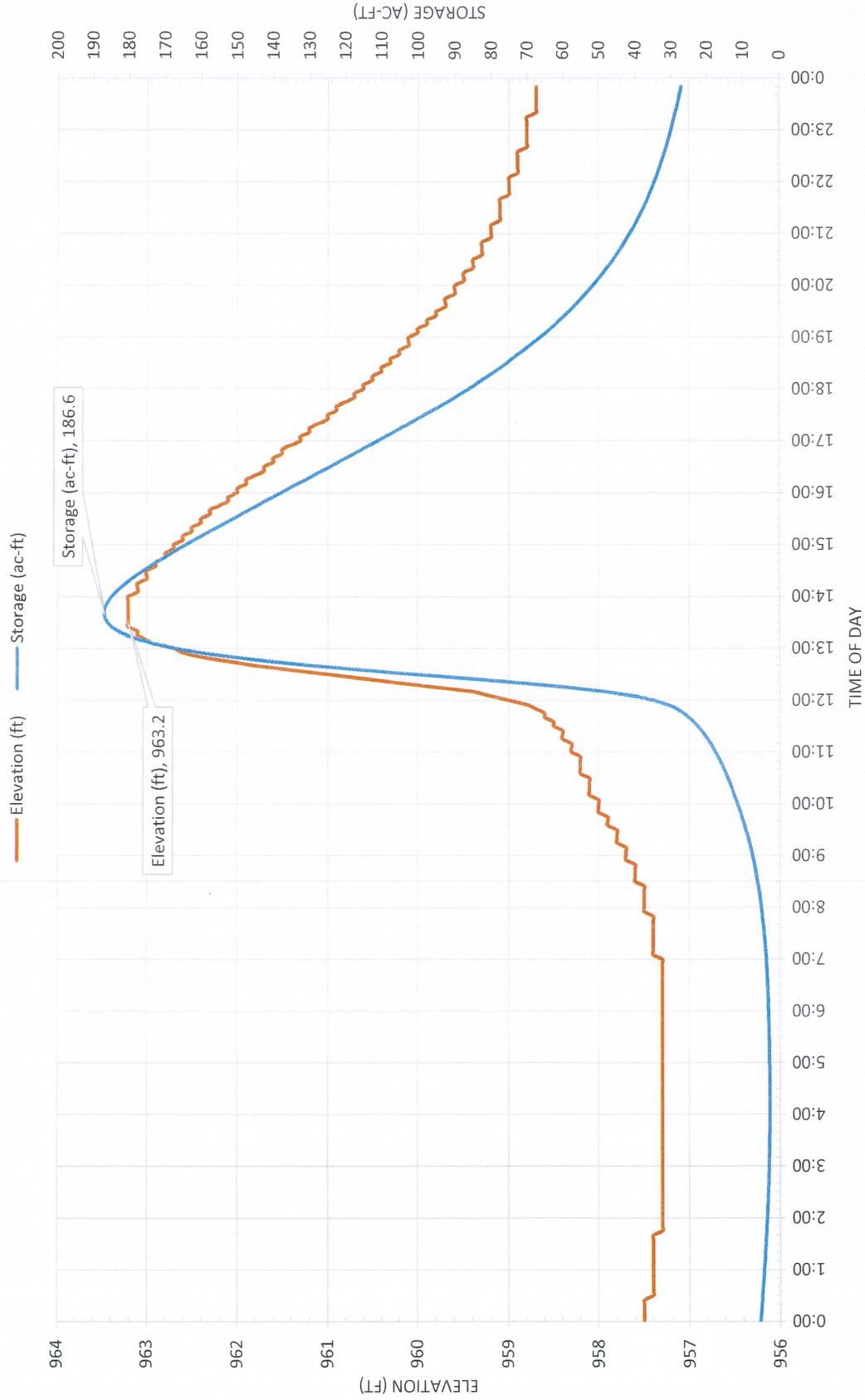
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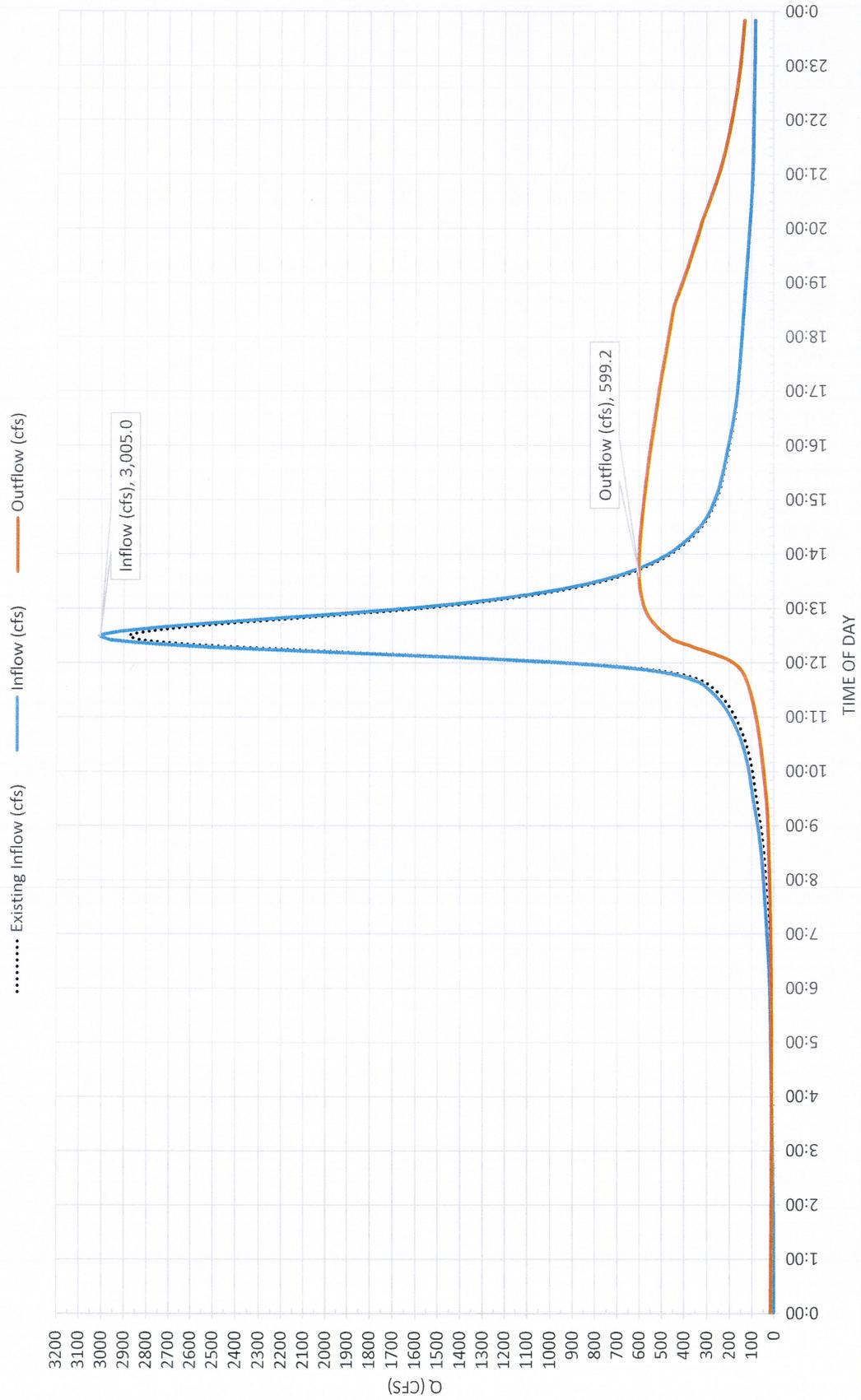
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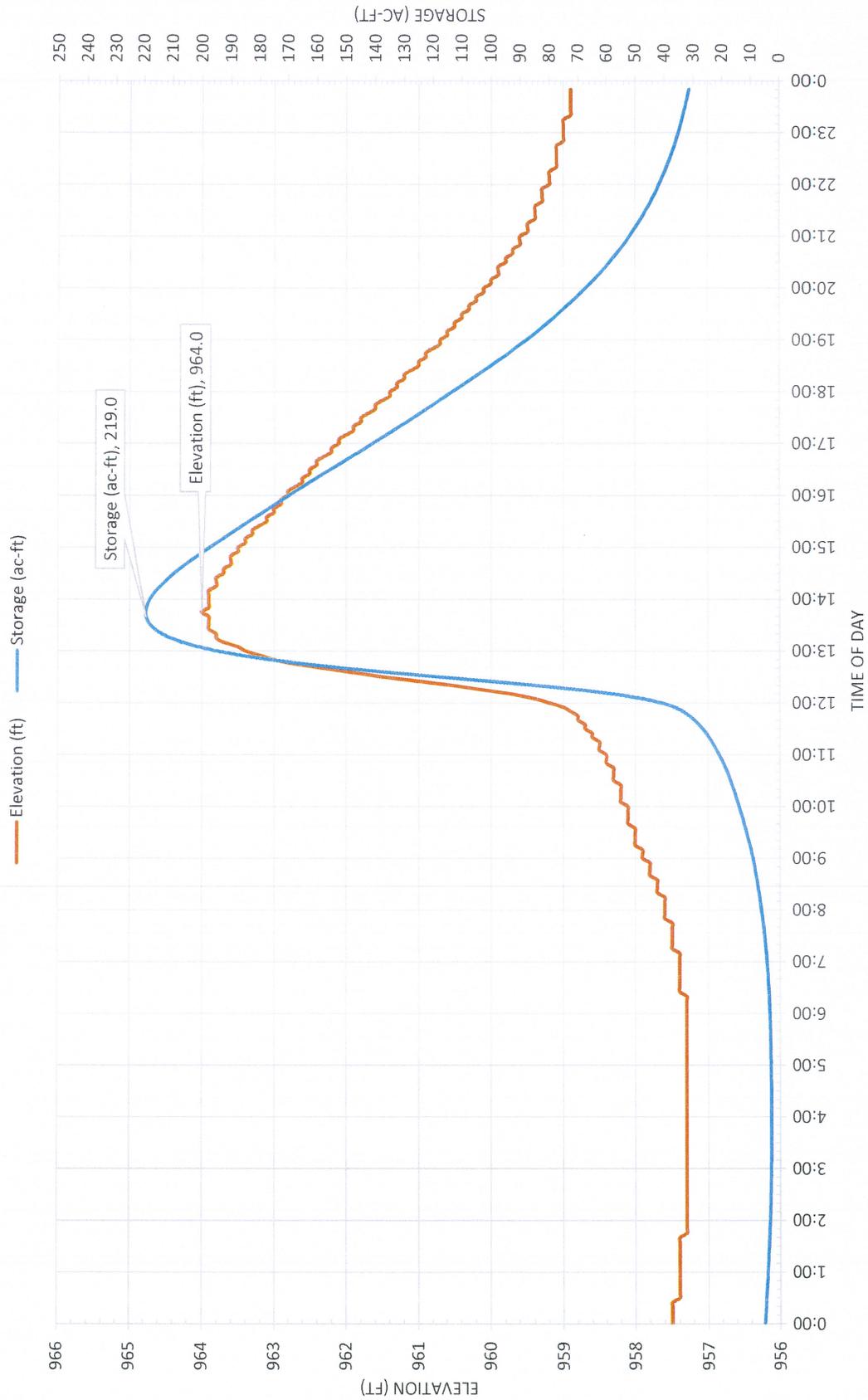
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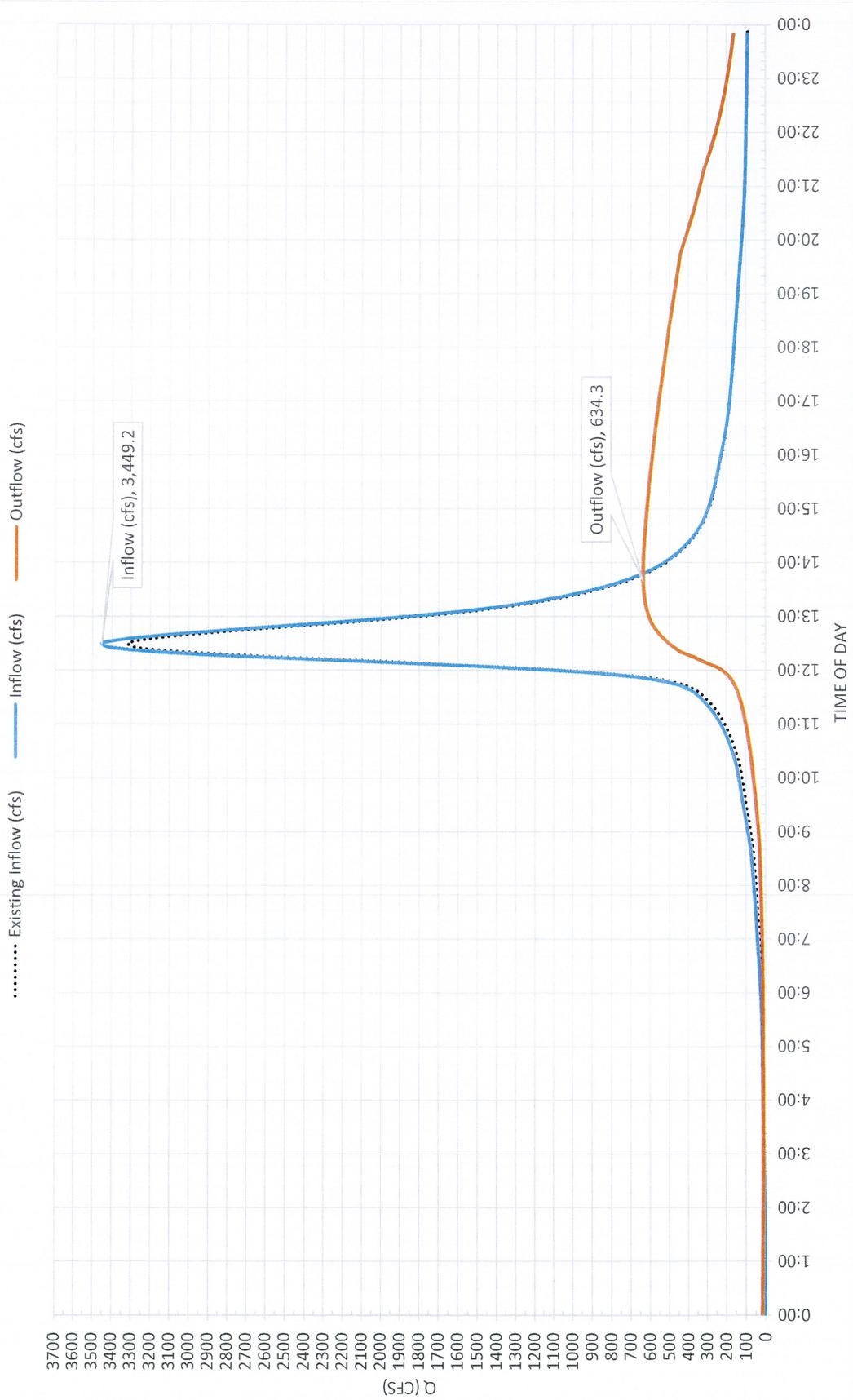
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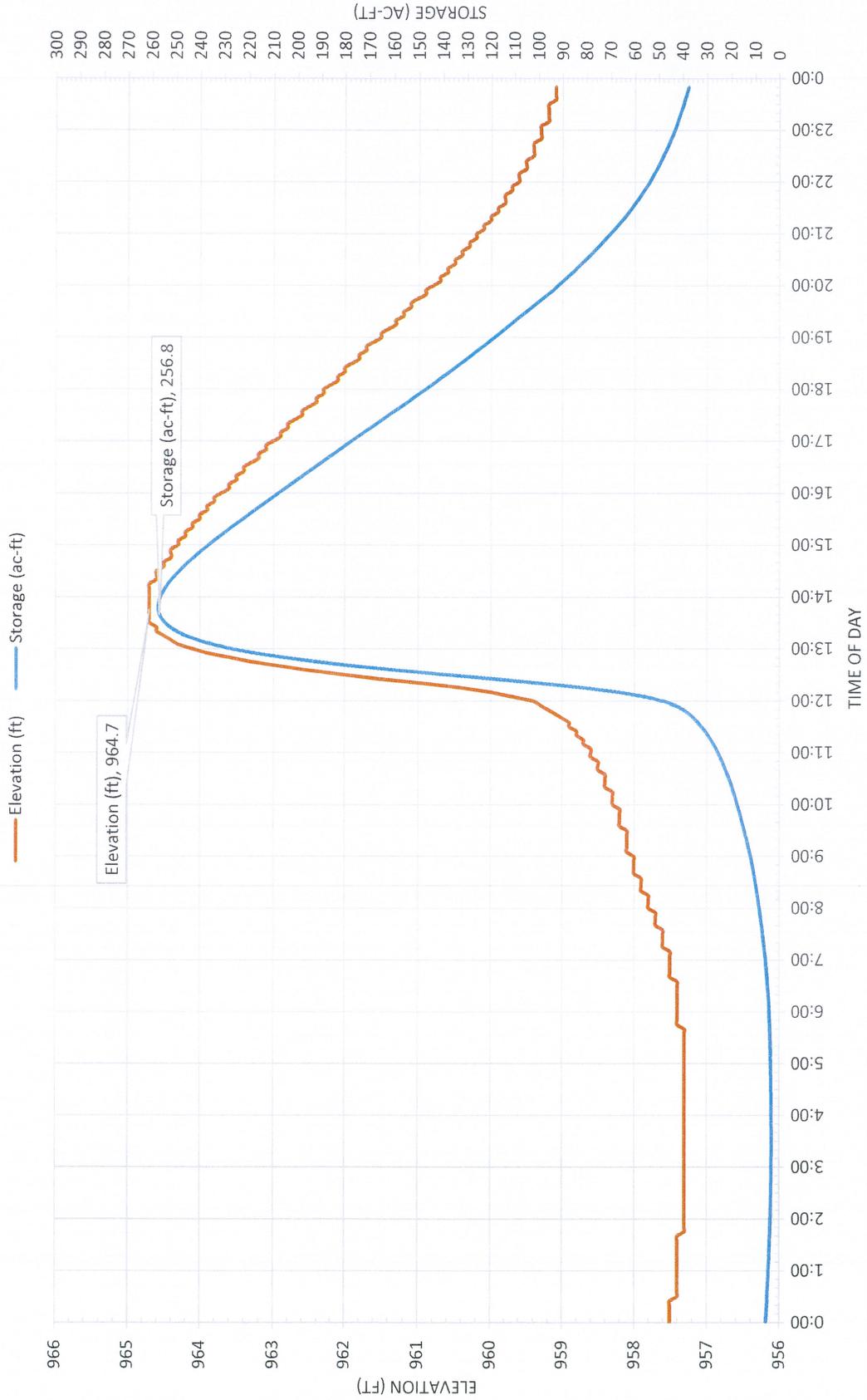
DRY-TO-WET BASIN OPTION - PHASE 2 50-YEAR STORM EVENT WITH FUTURE CID LAND USE



DRY-TO-WET BASIN OPTION - PHASE 2 100-YEAR STORM EVENT WITH FUTURE CID LAND USE

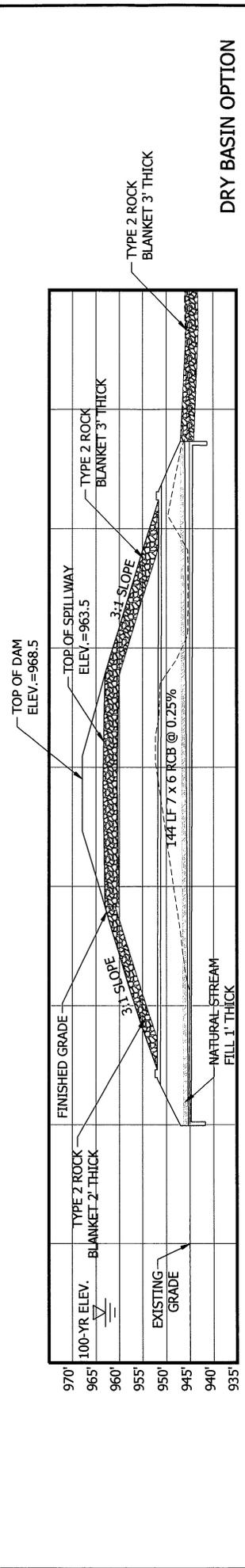
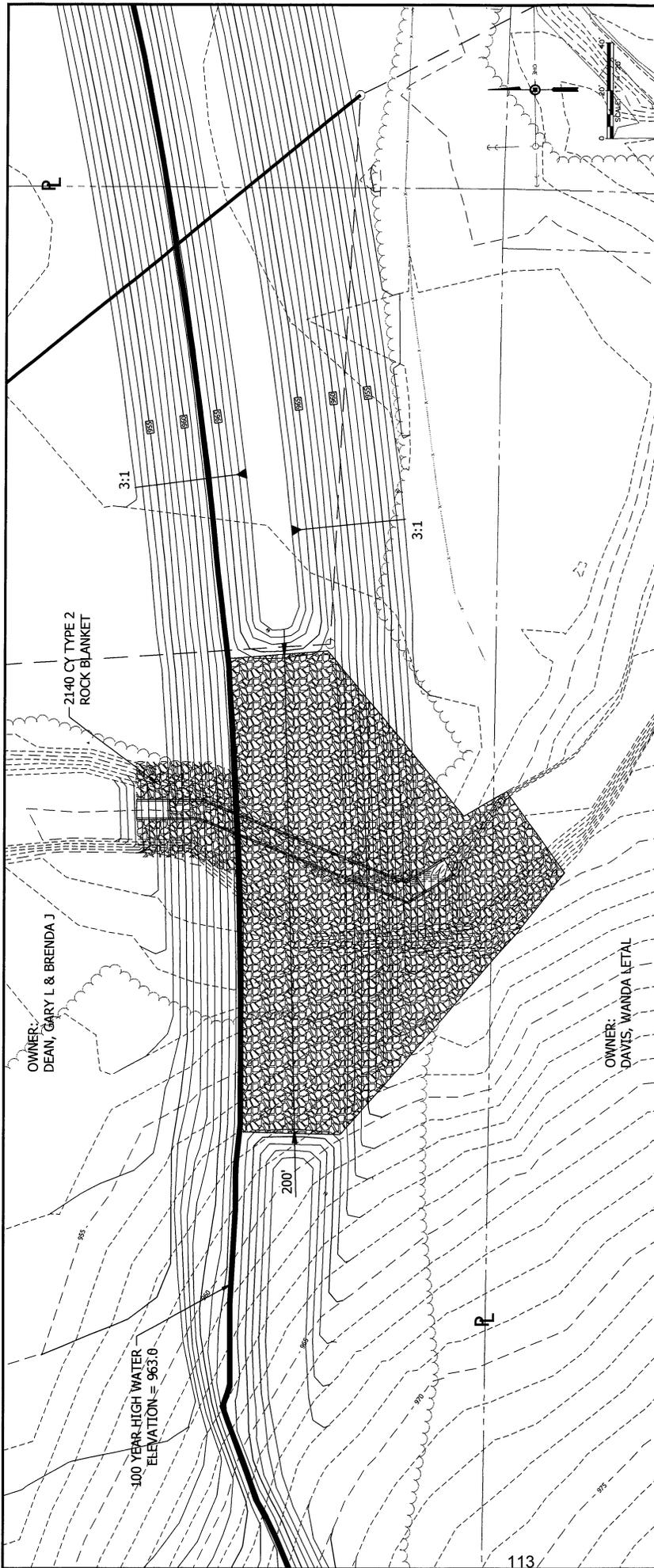


DRY-TO-WET BASIN OPTION - PHASE 2 100-YEAR STORM EVENT WITH FUTURE CID LAND USE



APPENDIX H

CONCEPT PLANS FOR DETENTION BASIN OPTIONS



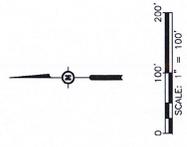
DRY BASIN OPTION



Small vertical text at the bottom of the page, likely a disclaimer or project information.



WET BASIN OPTION
BARTLETT & WEST



OWNER:
 DEAN, GARY L & BRENDA J

OWNER:
 DAVIS, WANDA LETAL

PERMANENT
 POOL 21.6 AC
 (ELEV. = 957.5')

100-YR FLOOD
 STORAGE 48.2 AC
 (ELEV. = 965.1')

TOP OF DAM
 (ELEV. = 970.6')

7x7' RISER
 (ELEV. = 957.5')

EMERGENCY
 SPILLWAY
 (ELEV. = 965.6')

TOP OF ROAD
 (ELEV. = 953')

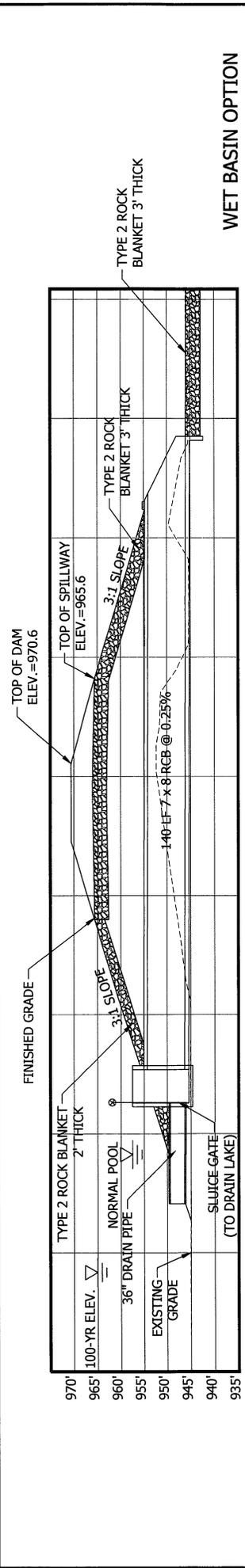
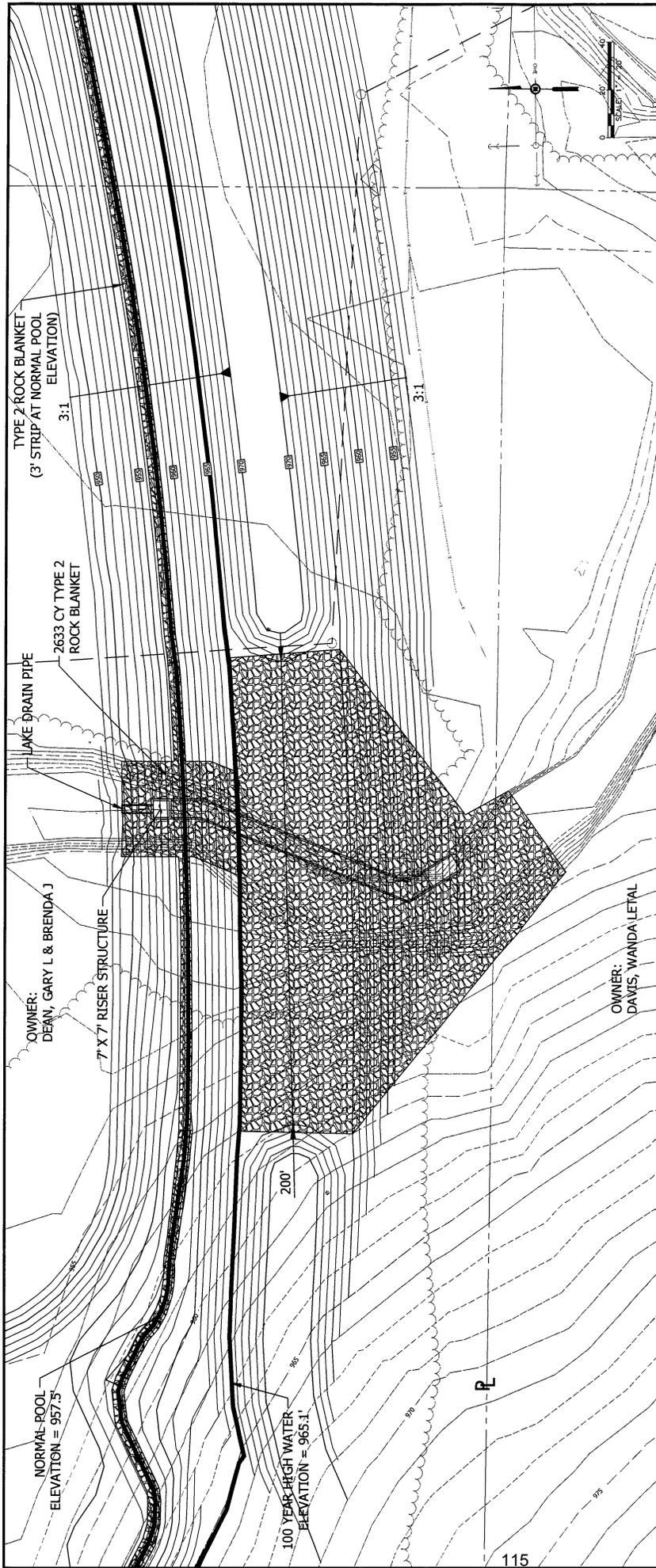
INTERSTATE 49

SCHOOL ROAD

213TH TERRACE

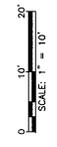
ELM STREET

EAST STREET



WET BASIN OPTION

BARTLETT & WEST



NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF BARTLETT & WEST.



**DRY TO WET BASIN OPTION
(DRY PHASE)**



CONSULTOR: BARTLETT & WEST, INC. 10000 W. CENTRAL EXPRESSWAY, SUITE 100, DALLAS, TEXAS 75243
 PROJECT: 10000 W. CENTRAL EXPRESSWAY, SUITE 100, DALLAS, TEXAS 75243
 DATE: 10/15/2013
 DRAWING NO.: 10000 W. CENTRAL EXPRESSWAY, SUITE 100, DALLAS, TEXAS 75243
 SCALE: AS SHOWN
 PROJECT MANAGER: JEFFREY L. BROWN
 DESIGNER: JEFFREY L. BROWN
 CHECKER: JEFFREY L. BROWN
 APPROVER: JEFFREY L. BROWN
 DATE: 10/15/2013



**DRY TO WET BASIN OPTION
(WET PHASE)**



APPENDIX I
COST ESTIMATES



Preliminary Engineer's Estimate

Date: December 16, 2015
 Project No.: 18146.100

Dry Basin Option					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENSION
1	Mobilization	%	7.0%	\$75,166.00	\$75,166.00
2	Removals, Clearing and Grubbing	AC	18	\$3,500.00	\$63,000.00
3	Contractor Furnished Surveying	LS	1	\$20,000.00	\$20,000.00
4	10" Ductile Iron Pipe	LF	399	\$150.00	\$59,850.00
5	7' x 6' RCB	LF	144	\$700.00	\$100,800.00
6	Four-Foot Diameter Manhole, Complete	EA	2	\$3,750.00	\$7,500.00
7	Abandon Existing Sewer Manhole	EA	1	\$500.00	\$500.00
8	Tie to Existing Sanitary Sewer	EA	2	\$3,000.00	\$6,000.00
6	Type 2 Rock Blanket	CY	2140	\$50.00	\$107,000.00
7	Class A Excavation	CY	78,560	\$5.00	\$392,800.00
8	Compacting Embankment (dam)	CY	35,415	\$5.00	\$177,075.00
9	Excessive Fill Placement on-site	CY	25,720	\$2.00	\$51,440.00
10	Replacement of Stockpiled Topsoil	CY	17,425	\$1.00	\$17,425.00
11	Erosion Control	LS	1	\$20,000.00	\$20,000.00
12	Cleanup, Final Grading, Seed, Mulch & Fertilize	AC	18	\$2,800.00	\$50,400.00
				Subtotal	\$1,235,437.00
	Contingency			10%	\$123,544.00
				Construction Cost :	\$1,358,981.00
	Engineering	LS	1	\$250,000.00	\$250,000.00
	Construction Administration	LS	1	\$100,000.00	\$100,000.00
	Permitting (Assumes No Mitigation)	LS	1	\$0.00	\$0.00
	Private Utility Relocation (Unknown)	EA	1	\$0.00	\$0.00
				Total Estimated Project Cost :	\$1,708,981.00

This project cost opinion was prepared using bid tabulation information available at the time of preparation and is prepared in good faith using engineer's judgment and experience. The engineer makes no guarantee as to the actual costs for construction.

Preliminary Engineer's Estimate



Date: December 16, 2015
Project No.: 18146.100

Wet Basin Option					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENSION
1	Mobilization	%	7.0%	\$132,539.00	\$132,539.00
2	Removals, Clearing and Grubbing	AC	23	\$3,500.00	\$80,500.00
3	Contractor Furnished Surveying	LS	1	\$30,000.00	\$30,000.00
4	36" RCP	LF	14	\$120.00	\$1,680.00
5	36" RCP End Section	EA	1	\$1,500.00	\$1,500.00
6	10" SDR 35 PVC	LF	3150	\$100.00	\$315,000.00
7	8" SDR 35 PVC	LF	10	\$75.00	\$750.00
8	Sluice Gate w/ Riser	EA	1	\$35,000.00	\$35,000.00
9	7' x 8' RCB	LF	140	\$800.00	\$112,000.00
10	7' x 7' Riser Structure	VF	15	\$1,000.00	\$15,000.00
11	Riser Trash Hood	LS	1	\$15,000.00	\$15,000.00
12	Four-Foot Diameter Manhole, Complete	EA	13	\$3,750.00	\$48,750.00
13	Remove Existing Sewer Manhole	EA	11	\$1,000.00	\$11,000.00
14	Tie to Existing Sanitary Sewer	EA	4	\$3,000.00	\$12,000.00
15	Connection to Existing Sewer Service Lateral	EA	2	\$2,500.00	\$5,000.00
16	Type 2 Rock Blanket	CY	2,571	\$50.00	\$128,550.00
17	Class A Excavation	CY	125,450	\$5.00	\$627,250.00
18	Compacting Embankment (dam)	CY	47,675	\$5.00	\$238,375.00
19	Excessive Fill Placement on-site	CY	53,875	\$2.00	\$107,750.00
20	Replacement of Stockpiled Topsoil	CY	23,900	\$1.00	\$23,900.00
21	Erosion Control	LS	1	\$20,000.00	\$20,000.00
22	Cleanup, Final Grading, Seed, Mulch & Fertilize	AC	23	\$2,800.00	\$64,400.00
Subtotal:					\$2,178,435.00
Contingency				10%	\$217,844.00
Construction Cost:					\$2,396,279.00
Engineering		LS	1	\$250,000.00	\$250,000.00
Construction Administration		LS	1	\$150,000.00	\$150,000.00
Permitting (Assumes Compensatory Mitigation)		LS	1	\$450,000.00	\$450,000.00
Private Utility Relocation (Unknown)		EA	1	\$0.00	\$0.00
Total Estimated Project Cost :					\$3,246,279.00

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Preliminary Engineer's Estimate



Date: December 16, 2015
Project No.: 18146.100

Dry-to-Wet Basin Option - Dry Phase					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENSION
1	Mobilization	%	7.0%	\$91,993.00	\$91,993.00
2	Removals, Clearing and Grubbing	AC	23	\$3,500.00	\$80,500.00
3	Contractor Furnished Surveying	LS	1	\$20,000.00	\$20,000.00
4	10" Ductile Iron Pipe	LF	399	\$150.00	\$59,850.00
5	7' x 9' RCB	LF	154	\$850.00	\$130,900.00
6	Four-Foot Diameter Manhole, Complete	EA	2	\$3,750.00	\$7,500.00
7	Abandon Existing Sewer Manhole	EA	1	\$500.00	\$500.00
8	Tie to Existing Sanitary Sewer	EA	2	\$3,000.00	\$6,000.00
9	Type 2 Rock Blanket	CY	2,311	\$50.00	\$115,550.00
10	Class A Excavation	CY	97,400	\$5.00	\$487,000.00
11	Compacting Embankment (dam)	CY	49,300	\$5.00	\$246,500.00
12	Excessive Fill Placement on-site	CY	27,380	\$2.00	\$54,760.00
13	Replacement of Stockpiled Topsoil	CY	20,720	\$1.00	\$20,720.00
14	Erosion Control	LS	1	\$20,000.00	\$20,000.00
15	Cleanup, Final Grading, Seed, Mulch & Fertilize	AC	23	\$2,800.00	\$64,400.00
	Subtotal				\$1,512,014.00
	Contingency			10%	\$151,202.00
	Construction Cost:				\$1,663,216.00
	Engineering	LS	1	\$250,000.00	\$250,000.00
	Construction Administration	LS	1	\$100,000.00	\$100,000.00
	Permitting (Assumes No Mitigation)	LS	1	\$0.00	\$0.00
	Private Utility Relocation (Unknown)	EA	1	\$0.00	\$0.00
	Total Estimated Project Cost :				\$2,013,216.00

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Preliminary Engineer's Estimate

Date: December 16, 2015
Project No.: 18146.100

Dry-to-Wet Basin Option - Wet Phase					
ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	EXTENSION
1	Mobilization	%	7.0%	\$90,272.00	\$90,272.00
2	Removals, Clearing and Grubbing	AC	13	\$3,500.00	\$45,500.00
3	Contractor Furnished Surveying	LS	1	\$15,000.00	\$15,000.00
4	Partial Removal of Box Culvert	LS	1	\$20,000.00	\$20,000.00
5	36" RCP	LF	14	\$120.00	\$1,680.00
6	36" RCP End Section	EA	1	\$1,500.00	\$1,500.00
7	10" SDR 35 PVC	LF	3150	\$85.00	\$267,750.00
8	8" SDR 35 PVC	LF	10	\$75.00	\$750.00
9	Sluice Gate w/ Riser	EA	1	\$35,000.00	\$35,000.00
10	7' x 7' Riser Structure	VF	15	\$1,000.00	\$15,000.00
11	Riser Trash Hood	LS	1	\$15,000.00	\$15,000.00
12	Four-Foot Diameter Manhole, Complete	EA	13	\$3,750.00	\$48,750.00
13	Abandon Existing Sewer Manhole	EA	10	\$500.00	\$5,000.00
14	Tie to Existing Sanitary Sewer	EA	4	\$3,000.00	\$12,000.00
15	Connection to Existing Sewer Service Lateral	EA	2	\$2,500.00	\$5,000.00
16	Type 2 Rock Blanket	CY	388	\$50.00	\$19,400.00
17	Class A Excavation	CY	102,205	\$5.00	\$511,025.00
18	Excessive Fill Placement on-site	CY	84,630	\$2.00	\$169,260.00
19	Replacement of Stockpiled Topsoil	CY	17,575	\$1.00	\$17,575.00
20	Erosion Control	LS	1	\$20,000.00	\$20,000.00
21	Cleanup, Final Grading, Seed, Mulch & Fertilize	AC	23	\$2,800.00	\$64,400.00
Subtotal					\$1,483,723.00
	Contingency			10%	\$148,373.00
Construction Cost:					\$1,632,096.00
	Engineering	LS	1	\$150,000.00	\$150,000.00
	Construction Administration	LS	1	\$100,000.00	\$100,000.00
	Permitting (Assumes Compensatory Mitigation)	LS	1	\$450,000.00	\$450,000.00
	Private Utility Relocation (Unknown)	EA	1	\$0.00	\$0.00
Total Estimated Project Cost:					\$2,332,096.00
Total Estimated Project Cost (Wet and Dry Phases):					\$4,345,312.00

This project cost opinion was prepared using bid tabulation information available at the time of preparation and is prepared in good faith using engineer's judgment and experience. The engineer makes no guarantee as to the actual costs for construction.

Policy on Code Enforcement
Presented by: Alderman Jerry Ford



City of Peculiar

250 S. Main
 Peculiar, MO 64078
 816-779-5212

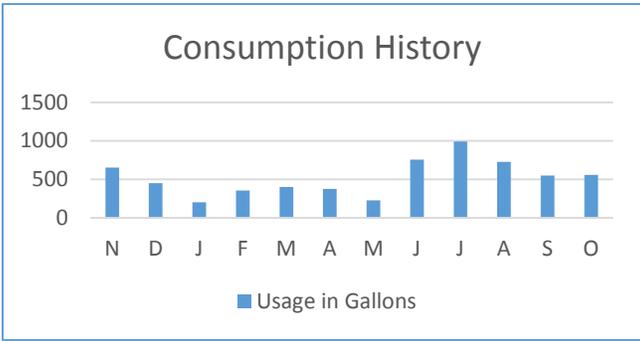
www.cityofpeculiar.org

Utility Statement



Special Notes Here

Name on Account			
John Doe 123 Anything Peculiar, MO 64078			
Account Number		Service Address	
12234-1		123 Anything	
Service Period		Meter Readings	
From	To	Previous	Present
10/18/15	11/18/15	8596	9120



Previous Balance	\$121.40
Payments	\$121.40
Adjustments	
Penalties	
Past Due Balance	
Due Date	12/15/15

WATER (consumption in gallons)

Fees and Charges	Consumption	Amount
Water	506	\$35.88
Voter Aprvd Wtr Bond		\$19.00
Primacy Fee		\$0.25
TOTAL WATER		\$55.13

SEWER (consumption in gallons)

Fees and Charges	Consumption	Amount
Sewer	506	\$35.88
Voter Aprvd Swr Bond		\$20.00
TOTAL SEWER		\$55.88

TRASH, TAXES & OTHER FEES

Fees and Charges	Amount
Trash Residential	\$14.80
Taxes (cumulative) will be broken down internally	\$1.12
Admin Fee	N/A
Deposit Refund	N/A
Returned Check Fee	N/A
TOTAL TRASH, TAXES & OTHER FEES	\$15.92

Current Rates

Water - \$0.01652 per Gallon
 Sewer - \$0.00765 per Gallon

Notes

Utility Bills are due upon receipt. The last day to pay to avoid penalties is the 15th.

Utility Bills not paid in full by the 23rd of each month are subject to disconnect by ordinance, and applicable administrative fees will apply regardless on any actual disconnection.

The City of Peculiar is not responsible for the timeliness of the United States Postal Service or for payments left in the available drop box.

Failure to receive your bill does not exempt you from monthly payments, penalties, or disconnection.

TOTAL UTILITY BILL DUE BY 12/15/2015	\$126.93
TOTAL UTILITY BILL DUE AFTER 12/15/2015 (10% Penalty)	\$139.62