



THE STATE OF KANSAS

WATER RESOURCES RECEIVED

MAR 19 2024

10:59

KS Dept. of Agriculture

KANSAS DEPARTMENT OF AGRICULTURE
Mike Beam, Secretary of Agriculture

DIVISION OF WATER RESOURCES
Earl D. Lewis Jr., Chief Engineer

51209

File Number
This item to be completed by the Division of Water Resources.

APPLICATION FOR PERMIT TO APPROPRIATE WATER FOR BENEFICIAL USE

Filing Fee Must Accompany the Application
(Please refer to Fee Schedule attached to this application form.)

To the Chief Engineer of the Division of Water Resources, Kansas Department of Agriculture,
1320 Research Park Drive, Manhattan, Kansas 66502:

1. Name of Applicant (Please Print): Keeling Land & Cattle-KS/CO LLC (Kim Howerton) (email: kim@3dsolutions.com)
Address: PO Box 326
City: Monett State MO Zip Code 65708
Telephone Number: (417) 772-4494

2. The source of water is: [X] surface water in overland flow runoff from contributing drainage area (stream)
OR [ ] groundwater in (drainage basin)

Certain streams in Kansas have minimum target flows established by law or may be subject to administration when water is released from storage for use by water assurance district members. If your application is subject to these regulations on the date we receive your application, you will be sent the appropriate form to complete and return to the Division of Water Resources. Maximum quantity equals constructed wetland storage plus net evaporation.

3. The maximum quantity of water desired is 106 acre-feet OR gallons per calendar year, to be diverted at a maximum rate of NF gallons per minute OR cubic feet per second.

Once your application has been assigned a priority, the requested maximum rate of diversion and maximum requested quantity of water under that priority number can NOT be increased. Please be certain your requested maximum rate of diversion and maximum quantity of water are appropriate and reasonable for your proposed project and are in agreement with the Division of Water Resources' requirements.

4. The water is intended to be appropriated for (Check use intended):
(a) [ ] Artificial Recharge (b) [ ] Irrigation (c) [X] Recreational (d) [ ] Water Power
(e) [ ] Industrial (f) [ ] Municipal (g) [ ] Stockwatering (h) [ ] Sediment Control
(i) [ ] Domestic (j) [ ] Dewatering (k) [ ] Hydraulic Dredging (l) [ ] Fire Protection
(m) [ ] Thermal Exchange (n) [ ] Contamination Remediation

YOU MUST COMPLETE AND ATTACH ADDITIONAL DIVISION OF WATER RESOURCES FORM(S) PROVIDING INFORMATION TO SUBSTANTIATE YOUR REQUEST FOR THE AMOUNT OF WATER FOR THE INTENDED USE REFERENCED ABOVE.

4/4/2024
KAnderson

For Office Use Only:
F.O. 1 GMD Meets K.A.R. 5-3-1 (YES/NO) Use REC Source G/S County CQ By ALB Date 3/21/24
Code REC Fee \$ 200 TR # Receipt Date 3-19-24 Check # 11001

MAR 19 2024

File No. \_\_\_\_\_

KS Dept. of Agriculture

5. The location of the proposed wells, pump sites or other works for diversion of water is:

**Note:** For the application to be accepted, the point of diversion location must be described to at least a 10 acre tract, unless you specifically request a 60 day period of time in which to locate the site within a specifically described, minimal legal quarter section of land. (D)(E)(F)(G) = Water Control Structures

(D) One in the SE quarter of the NW quarter of the SE quarter of Section 17, more particularly described as being near a point 1,426 feet North and 1,456 feet West of the Southeast corner of said section, in Township 34 South, Range 12 East, Chautauqua County, Kansas.

(E) One in the NW quarter of the SW quarter of the SW quarter of Section 16, more particularly described as being near a point 1,471 feet North and 5,242 feet West of the Southeast corner of said section, in Township 34 South, Range 12 East, Chautauqua County, Kansas.

(F) One in the NE quarter of the SW quarter of the NW quarter of Section 16, more particularly described as being near a point 3,903 feet North and 4,298 feet West of the Southeast corner of said section, in Township 34 South, Range 12 East, Chautauqua County, Kansas.

(G) One in the NW quarter of the SE quarter of the NW quarter of Section 16, more particularly described as being near a point 3,562 feet North and 3,853 feet West of the Southeast corner of said section, in Township 34 South, Range 12 East, Chautauqua County, Kansas.

If the source of supply is groundwater, a separate application shall be filed for each proposed well or battery of wells, except that a single application may include up to four wells within a circle with a quarter (1/4) mile radius in the same local source of supply which do not exceed a maximum diversion rate of 20 gallons per minute per well.

A battery of wells is defined as two or more wells connected to a common pump by a manifold; or not more than four wells in the same local source of supply within a 300 foot radius circle which are being operated by pumps not to exceed a total maximum diversion rate of 800 gallons per minute and which supply water to a common distribution system.

6. The owner of the point of diversion, if other than the applicant is (please print):

\_\_\_\_\_  
(name, address and telephone number)

\_\_\_\_\_  
(name, address and telephone number)

You must provide evidence of legal access to, or control of, the point of diversion from the landowner or the landowner's authorized representative. Provide a copy of a recorded deed, lease, easement or other document with this application. In lieu thereof, you may sign the following sworn statement:

I have legal access to, or control of, the point of diversion described in this application from the landowner or the landowner's authorized representative. I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 15, 2024.

  
\_\_\_\_\_  
Applicant's Signature

The applicant must provide the required information or signature irrespective of whether they are the landowner. Failure to complete this portion of the application will cause it to be unacceptable for filing and the application will be returned to the applicant.

7. The proposed project for diversion of water will consist of four (4) wetland cells with water control structures and was completed (by) previous landowner in 2019.  
(number of wells, pumps or dams, etc.)  
(Month/Day/Year - each was or will be completed)

8. The first actual application of water for the proposed beneficial use was or is estimated to be following approval.  
(Mo/Day/Year)

MAR 19 2024

File No. \_\_\_\_\_

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9. Will pesticide, fertilizer, or other foreign substance be injected into the water pumped from the diversion works?  
 Yes  No If "yes", a check valve shall be required.

All chemigation safety requirements must be met including a chemigation permit and reporting requirements.

10. If you are planning to impound water, please contact the Division of Water Resources for assistance, prior to submitting the application. Please attach a reservoir area capacity table and inform us of the total acres of surface drainage area above the reservoir.

Have you also made an application for a permit for construction of this dam and reservoir with the Division of Water Resources?  Yes  No

- If yes, show the Water Structures permit number here Floodplain fill permit pending
- If no, explain here why a Water Structures permit is not required \_\_\_\_\_

11. The application must be supplemented by a U.S.G.S. topographic map, aerial photograph or a detailed plat showing the following information. On the topographic map, aerial photograph, or plat, identify the center of the section, the section lines or the section corners and show the appropriate section, township and range numbers. Also, please show the following information:

- (a) The location of the proposed point(s) of diversion (wells, stream-bank installations, dams, or other diversion works) should be plotted as described in Paragraph No. 5 of the application, showing the North-South distance and the East-West distance from a section line or southeast corner of section.
- (b) If the application is for groundwater, please show the location of any existing water wells of any kind within ½ mile of the proposed well or wells. Identify each existing well as to its use and furnish the name and mailing address of the property owner or owners. If there are no wells within ½ mile, please advise us.
- (c) If the application is for surface water, the names and addresses of the landowner(s) ½ mile downstream and ½ mile upstream from your property lines must be shown.
- (d) The location of the proposed place of use should be shown by crosshatching on the topographic map, aerial photograph or plat.
- (e) Show the location of the pipelines, canals, reservoirs or other facilities for conveying water from the point of diversion to the place of use.

A 7.5 minute U.S.G.S. topographic map may be obtained by providing the section, township and range numbers to: Kansas Geological Survey, 1930 Constant, Campus West, University of Kansas, Lawrence, Kansas 66047.

12. List any application, appropriation of water, water right, or vested right file number that covers the same diversion points or any of the same place of use described in this application. Also list any other recent modifications made to existing permits or water rights in conjunction with the filing of this application.

Pumping site (direct diversion) from adjacent Middle Caney Creek. The direct diversion application was received by DWR on August 4, 2022 and was assigned File Number 50841.

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MAR 19 2024

File No. \_\_\_\_\_

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13. Furnish the following well information if the proposed appropriation is for the use of groundwater. If the well has not been completed, give information obtained from test holes, if available.

Information below is from:     Test holes     Well as completed     Drillers log attached

Well location as shown in paragraph No.	(A)	(B)	(C)	(D)
Date Drilled	_____	_____	_____	_____
Total depth of well	_____	_____	_____	_____
Depth to water bearing formation	_____	_____	_____	_____
Depth to static water level	_____	_____	_____	_____
Depth to bottom of pump intake pipe	_____	_____	_____	_____

14. The relationship of the applicant to the proposed place where the water will be used is that of owner / operator  
(owner, tenant, agent or otherwise)

15. The owner(s) of the property where the water is used, if other than the applicant, is (please print):

\_\_\_\_\_  
(name, address and telephone number)

\_\_\_\_\_  
(name, address and telephone number)

16. The undersigned states that the information set forth above is true to the best of his/her knowledge and that this application is submitted in good faith.

Dated at MONETT, MISSOURI ~~Kansas~~, this 15<sup>th</sup> day of March, 2024.  
(month) (year)

*Keelingland & Castle KS/CO*

(Applicant Signature)

By *[Signature]*  
(Agent or Officer Signature)

*Kevin Keeling*  
(Agent or Officer - Please Print)

Assisted by Brian W. Severin, P.E. Sustainable Environmental Consultants Date: 3/12/2024  
(office/title)

MAR 19 2024

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## FEE SCHEDULE

1. The fee for an application for a permit to appropriate water for beneficial use, except for domestic use, shall be (see paragraph No. 2 below if requesting storage):

ACRE-FEET	FEE
0-100	\$200.00
101-320	\$300.00
More than 320	\$300.00 plus \$20.00 for each additional 100 acre-feet or any part thereof.

2. The fee for an application in which storage is requested, except for domestic use, shall be:

ACRE-FEET	FEE
0-250	\$200.00
More than 250	\$200.00 plus \$20.00 for each additional 250 acre-feet of storage or any part thereof.

Note: If an application requests both direct use *and* storage, the fee charged shall be as determined under No. 1 or No. 2 above, whichever is greater, but not both fees.

3. The fee for an application for a permit to appropriate water for water power or dewatering purposes shall be \$100.00 plus \$200.00 for each 100 cubic feet per second, or part thereof, of the diversion rate requested.

Note: The applicant shall notify the Chief Engineer and pay the statutorily required field inspection fee of \$400.00 when construction of the works for diversion has been completed, except that for applications filed on or after July 1, 2009, for works constructed for sediment control use and for evaporation from a groundwater pit for industrial use shall be accompanied by a field inspection fee of \$200.00.

### MAKE CHECKS PAYABLE TO THE KANSAS DEPARTMENT OF AGRICULTURE

#### ATTENTION

A Water Conservation Plan may be required per K.S.A. 82a-733. A statement that your application for permit to appropriate water may be subject to the minimum desirable streamflow requirements per K.S.A. 82a-703a, b, and c may also be required from you. After the Division of Water Resources has had the opportunity to review your application, you will be notified whether or not you will need to submit a Water Conservation Plan. You also may be required to install a water flow meter or water stage measuring device on your diversion works prior to diverting water. There may be other special conditions or Groundwater Management District regulations that you will need to comply with if this application is approved.

#### CONVERSION FACTORS

1 acre-foot equals 325,851 gallons

1 million gallons equal 3.07 acre-feet

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### RECREATIONAL USE SUPPLEMENTAL SHEET

File No. \_\_\_\_\_

Name of Applicant (Please Print): Keeling Land & Cattle-KS/CO LLC (Kim Howerton)

1. Please indicate type of recreational use (boating, fishing, swimming, etc.): Constructed low level wetland dikes to seasonally impound shallow water for wildlife use.

2. Please summarize how the water will be used and justify the quantity of water requested: Constructed wetland storage plus net evaporation at the auxiliary spillway elevation (Dikes 1, 3, 4) and top of dike elevation (Dike 2) = 106 acre-feet. The installed water control structures will release runoff and stored water back into the creek.

3. Please complete the following table showing estimated future water requirements:

ESTIMATED FUTURE WATER DIVERTED/STORED	
NEXT 5 YEARS	WATER TO BE DIVERTED (ACRE-FEET OR GALLONS)
Year 1	106 acre-feet
Year 2	106 acre-feet
Year 3	106 acre-feet
Year 4	106 acre-feet
Year 5	106 acre-feet

Please attach any additional information, tables, or curves showing past, present and estimated future water requirements to substantiate the amount of water requested.

4. Please designate the legal description of the location where the water is to be used by providing the fractional part of the Section, Township and Range.

NW 1/4 Sec 16, T-34S; R-12E (see plan sheets)

SE 1/4 Sec 17, T-34S; R-12E (see plan sheets)

You may attach any additional information you believe will assist in informing the Division of the need for your request.



# SUSTAINABLE

Environmental Consultants

## Keeling Land & Cattle - KS/Co LLC Wetland Development (As Constructed)

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Prepared by:

Brian W. Severin, P.E., Director of Technical Services  
bseverin@sustainableenviro.com  
785-207-0201

March 13, 2024



## Design Report

### Project Information

- Name: Keeling Land & Cattle-KS/CO LLC
- Legal: NW 1/4 Sec 16, T-34S; R-12E & SE 1/4 Sec 17, T-34S; R-12E
- Location: Chautauqua County, Kansas

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### Project Description

The project is located along Middle Caney Creek. The wetland development includes four wetland cells with a water control structures. The dike structures were constructed by a previous landowner in 2019 (prior to securing permits). The low-level dikes provide additional water storage and create diverse topography within the degraded wetland area. The dikes will increase water storage capacity and maintain hydrology at times throughout the year. The project will not hydraulically affect adjacent landowners, as the permanent pools will be confined to the landowner's property.

### Design

The Dike 1 wetland cell has a drainage area of 34.9 acres. The Dike 2 wetland cell has a drainage area of 32.3 acres. The Dike 3 wetland cell has a drainage area of 16.6 acres. The Dike 4 wetland cell has a drainage area of 16.8 acres. The drainage area into all wetland cells is from direct rainfall and overland flow runoff. The low-level dikes are expected to overtop during runoff and flood events. The structures were constructed with a minimum profile to reduce dike damage during these events. Average annual rainfall and seasonal flooding is expected to maintain wetland hydrology throughout the year. However (permit pending), the cell will be supplemented with pumped surface water from Middle Caney Creek.

### Permitting and Permissions

The following permits will be required for the as constructed activities. Pertinent information for the permits has been supplied on the permit applications or has previously been submitted by the landowner.

- Kansas Department of Agriculture, Division of Water Resources: DWR 1-100 Water Appropriation for Beneficial Use (Direct Diversion – Pump Site)
  - Previous landowner, Richard Davis, submitted a DWR 1-100 application. The application was received by DWR on August 4, 2022 and was assigned File Number 50841.
- Kansas Department of Agriculture, Division of Water Resources: DWR 1-100 Water Appropriation for Beneficial Use (Natural Flow – Surface Water Storage)
- Kansas Department of Agriculture, Division of Water Resources: DWR 2-200 Floodplain Fill
  - The as constructed wetland project will require a variance to K.A.R 5-45-12. Levees and floodplain fills; setback. Portions of Dike 2 and Dike 4 do not meet the required 100-ft setback from the adjacent creek bank. See plan sheets for additional detail.

Dike 2 (Sta 2+50 – 11+00 and Sta 14+50 – 17+00) averages 70 feet of setback from the creek, with the closest setback distance being 45 feet (Sta 6+00). The creek bank is stable and vegetated. Google Earth imagery over the past 20+ years shows little to no erosion and/or advancement of the creek bank.

Dike 4 (Sta 9+50 – 14+50 and Sta 16+25 – 19+50) averages 70 feet of setback from the creek, with the closest setback distance being 50 feet (Sta 13+00). The creek bank is stable and vegetated. Google Earth imagery over the past 20+ years shows little to no erosion and/or advancement of the creek bank.



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### **Survey**

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The as constructed project was surveyed by Matt Miller, Engineering Technician, Sustainable Environmental Consultants using survey grade GPS equipment. The survey data was OPUS corrected and transformed to Kansas State Plane, Zone South (1502) US Survey Feet, NAVD88 Vertical Datum, 2018 Geoid. The project is tied to permanent benchmarks labeled and described on the Plan Sheets. LiDAR data was elevation corrected to match the OPUS corrected survey data and used for the as constructed design documentation.

### **Appendix**

The attached Appendix includes Plan Sheets, KDA-DWR Report, and Permit Documentation.



# SUSTAINABLE Environmental Consultants

Project: Keeling Land & Cattle-KS/CO LLC

Practice: Wetland Development (As Constructed)

Location: NW 1/4 Sec 16, T-34S; R-12E

SE 1/4 Sec 17, T-34S; R-12E

Chautauqua County, Kansas

### Index to Drawings

Sheet No.	Description
1	Cover Sheet
2	Location Map and Table of Quantities
3	Orthographic Plan Map
4	Dike 1 and Dike 2 Plan View and Storage Tables
5	Dike 3 and Dike 4 Plan View and Storage Tables
6	Dike 1 Profile
7	Dike 1 Cross Sections
8	Dike 2 Profile
9	Dike 2 Profile and Cross Section
10	Dike 2 Cross Sections
11	Dike 3 Profile
12	Dike 3 Cross Sections
13	Dike 4 Profile
14	Dike 4 Cross Sections
15	Base Flood Analysis
16	Base Flood Analysis

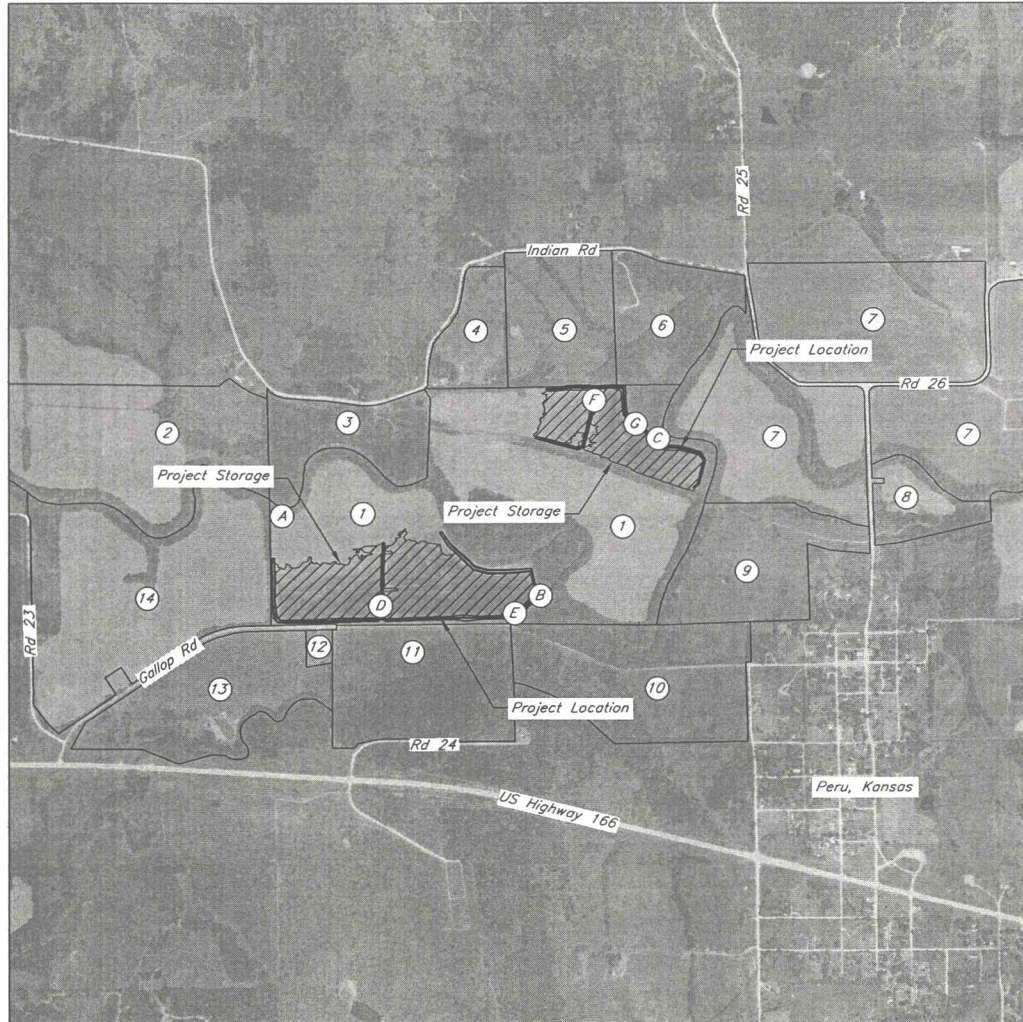
Brian W. Severin, P.E.      February 2024  
Designed by      Date



\_\_\_\_\_  
Approved by      Date

Before any investigation or construction activity, the excavator is responsible for calling Kansas One-Call at 800-344-7233 (800-DIG-SAFE) or 811

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The approximate project location is 0.5 mile west, northwest of Peru, Kansas.

Upstream and Downstream Landowners

- 1) Project Location  
Keeling Land & Cattle-KS/CO LLC  
PO Box 326  
Monett, Missouri 65708
- 2) Ross, William A & Sharon  
PO Box 389  
Sedan, Kansas 67361
- 3) Hull, Gregory A  
% Hull, Alan  
201 E Laurel  
Sedan, Kansas 67361
- 4) Walker, Nolan & Desiray  
2385 Indian Rd  
Sedan, Kansas 67361
- 5) Pyle, Francis L & Linda L  
9560 N 3975 Rd  
Copan, Oklahoma 74022
- 6) Storehouse Properties LLC  
79605 Nina Circle  
Haysville, Kansas 67060
- 7) Carter, Chad J & Lindsey L  
1072 Road 26  
Sedan, Kansas 67361
- 8) McMillan, Daniel & Cheryl  
781 Rd 23  
Peru, Kansas 67360
- 9) Hann, Irvin M & Marion D Rev Living Trust  
205 S Chautauqua  
Sedan, Kansas 67361
- 10) Carter, Mary Jo  
% Carter, Mary Josephine  
11539 Green Oaks  
Houston, Texas 77024
- 11) McKinney, Jay L & Teresa C  
15110 W 29th St North  
Wichita, Kansas 67223
- 12) Kincaid, Marion  
356 SE Elmhurst  
Bartlesville, Oklahoma 74006
- 13) NDTCO FBO Darrin McCloud IRA  
% McCloud Darrin & Kari  
24100 N 3965 Road  
Bartlesville, Oklahoma 74006
- 14) Gorby, John D Jr & Teresa K  
518 E Logan  
Ottawa, Kansas 66067

Points of Diversion

- A) Pump Site - Direct Diversion
- B) Pump Site - Direct Diversion
- C) Pump Site - Direct Diversion
- D) Water Control Structure - Storage
- E) Water Control Structure - Storage
- F) Water Control Structure - Storage
- G) Water Control Structure - Storage

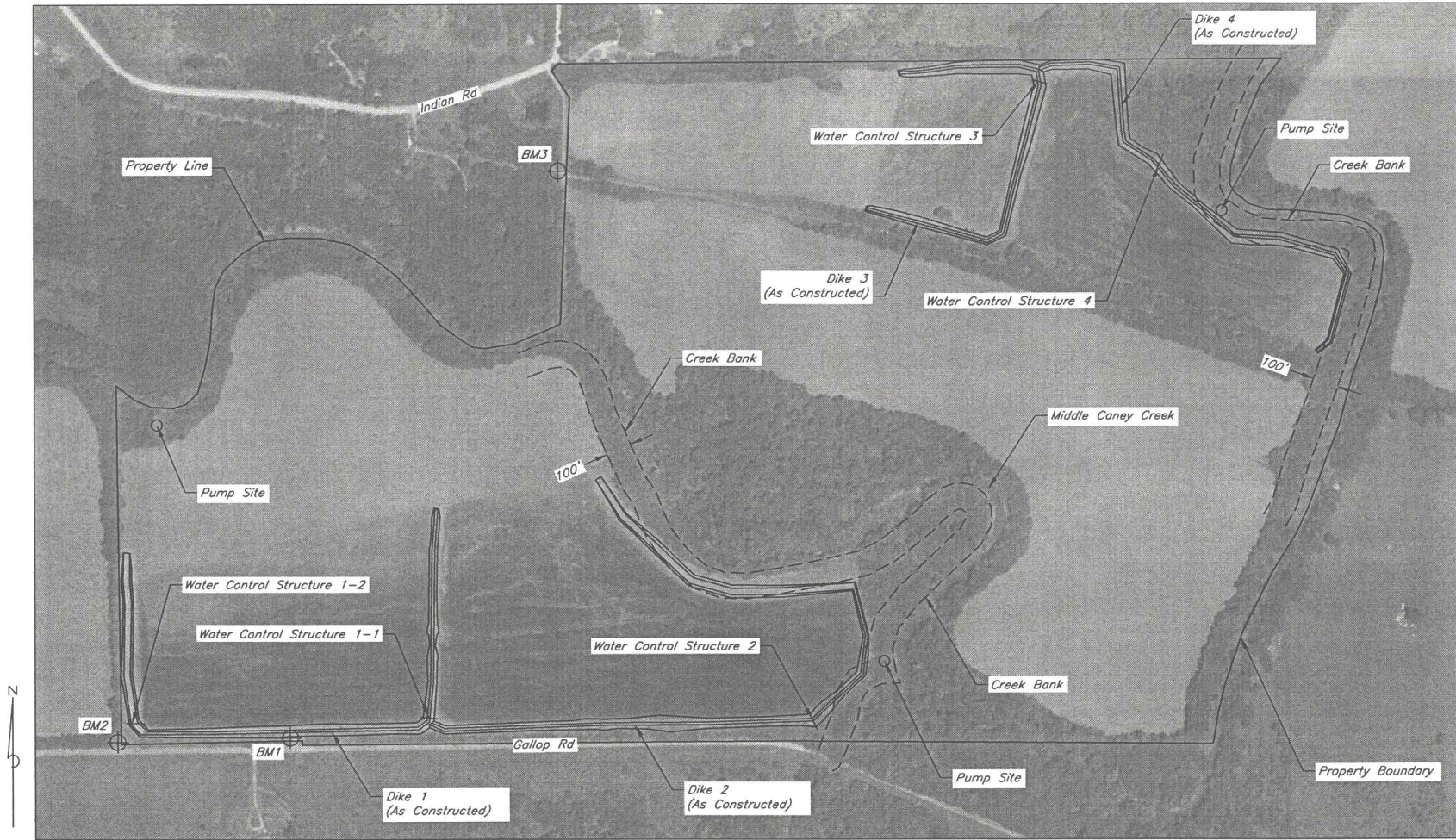
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Designed	B. Severin	Date	02/24
Drawn	B. Severin		03/24
Checked	M. Miller		03/24
Approved	B. Severin		03/24

Keeling Land & Cattle-KS/CO LLC  
Wetland Development (As Constructed)  
NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
Chautauqua County, Kansas

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Benchmark Table				
Benchmark	Northing	Easting	Survey Elevation	Description
BM1	1474223.54	2007702.88	788.48	Top of rebar
BM2	1474207.10	2007033.90	789.44	Top of rebar
BM3	1476410.18	2008731.97	796.31	Top of rebar

Survey Area:  
Kansas State Plane (South)

Orthographic Plan Map

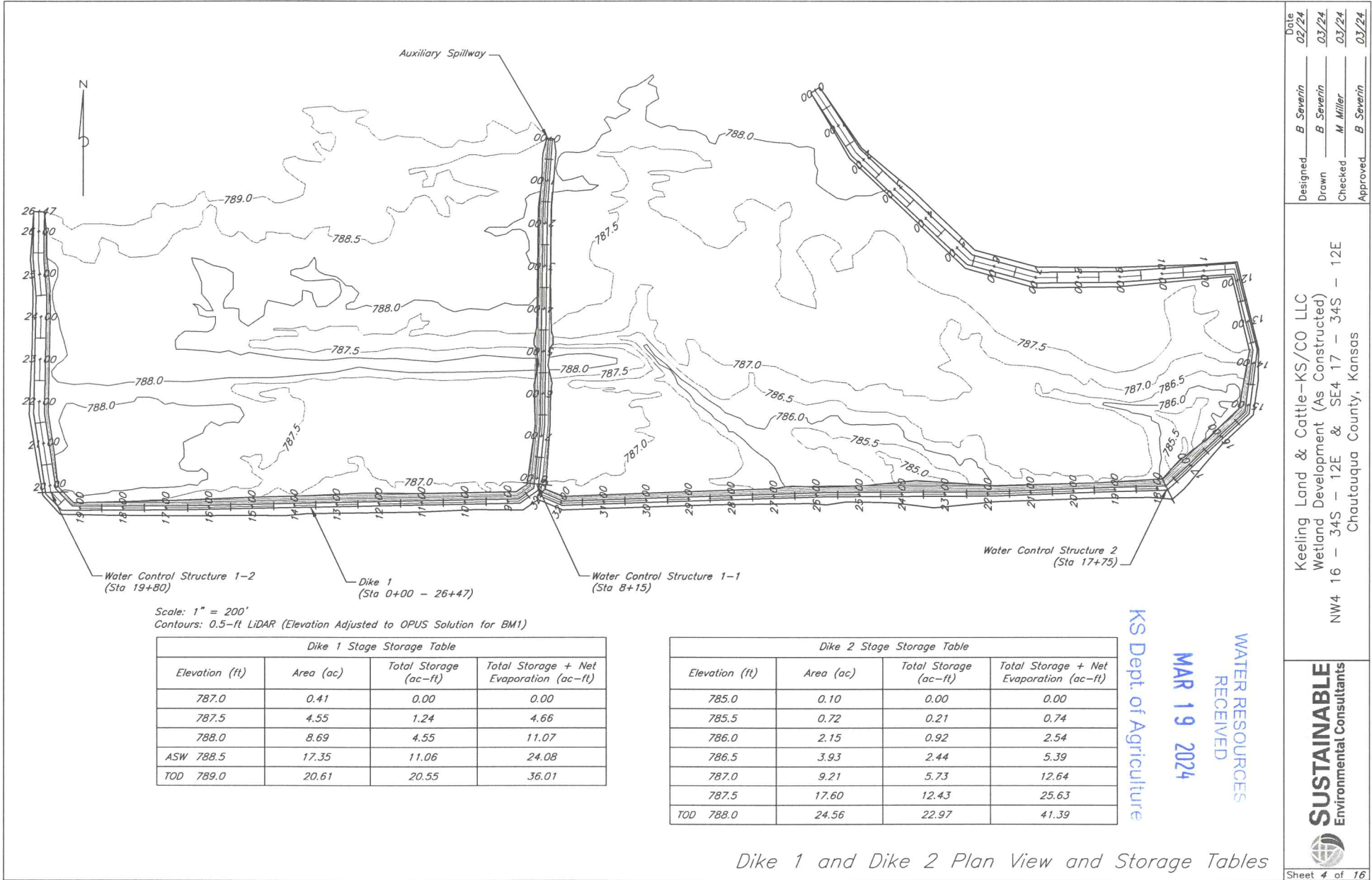
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Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

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Sheet 3 of 16



Scale: 1" = 200'  
 Contours: 0.5-ft LiDAR (Elevation Adjusted to OPUS Solution for BM1)

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
787.0	0.41	0.00	0.00
787.5	4.55	1.24	4.66
788.0	8.69	4.55	11.07
ASW 788.5	17.35	11.06	24.08
TOD 789.0	20.61	20.55	36.01

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
785.0	0.10	0.00	0.00
785.5	0.72	0.21	0.74
786.0	2.15	0.92	2.54
786.5	3.93	2.44	5.39
787.0	9.21	5.73	12.64
787.5	17.60	12.43	25.63
TOD 788.0	24.56	22.97	41.39

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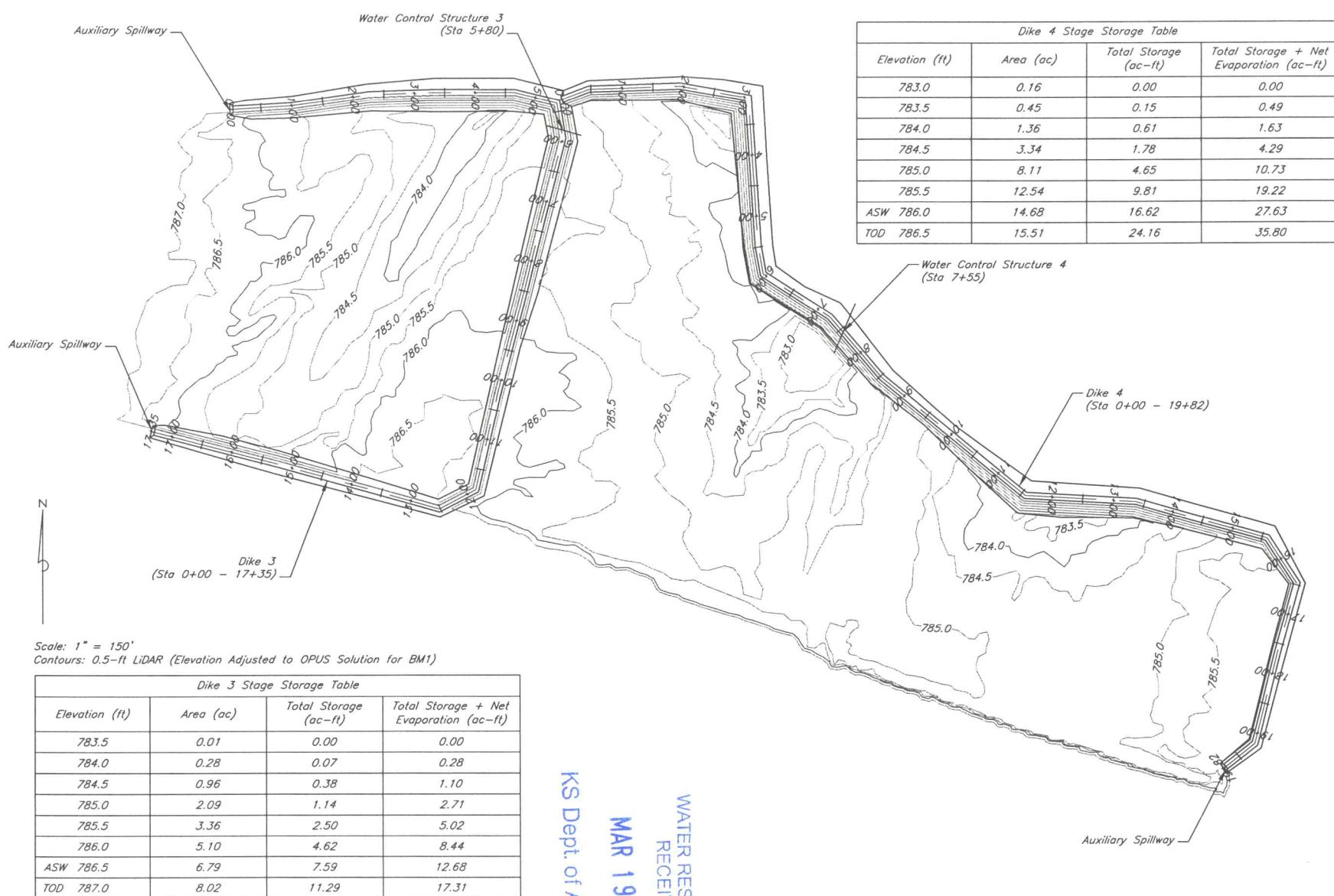
Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

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Dike 1 and Dike 2 Plan View and Storage Tables



**Dike 4 Stage Storage Table**

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
783.0	0.16	0.00	0.00
783.5	0.45	0.15	0.49
784.0	1.36	0.61	1.63
784.5	3.34	1.78	4.29
785.0	8.11	4.65	10.73
785.5	12.54	9.81	19.22
ASW 786.0	14.68	16.62	27.63
TOD 786.5	15.51	24.16	35.80

Scale: 1" = 150'  
 Contours: 0.5-ft LiDAR (Elevation Adjusted to OPUS Solution for BM1)

**Dike 3 Stage Storage Table**

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
783.5	0.01	0.00	0.00
784.0	0.28	0.07	0.28
784.5	0.96	0.38	1.10
785.0	2.09	1.14	2.71
785.5	3.36	2.50	5.02
786.0	5.10	4.62	8.44
ASW 786.5	6.79	7.59	12.68
TOD 787.0	8.02	11.29	17.31

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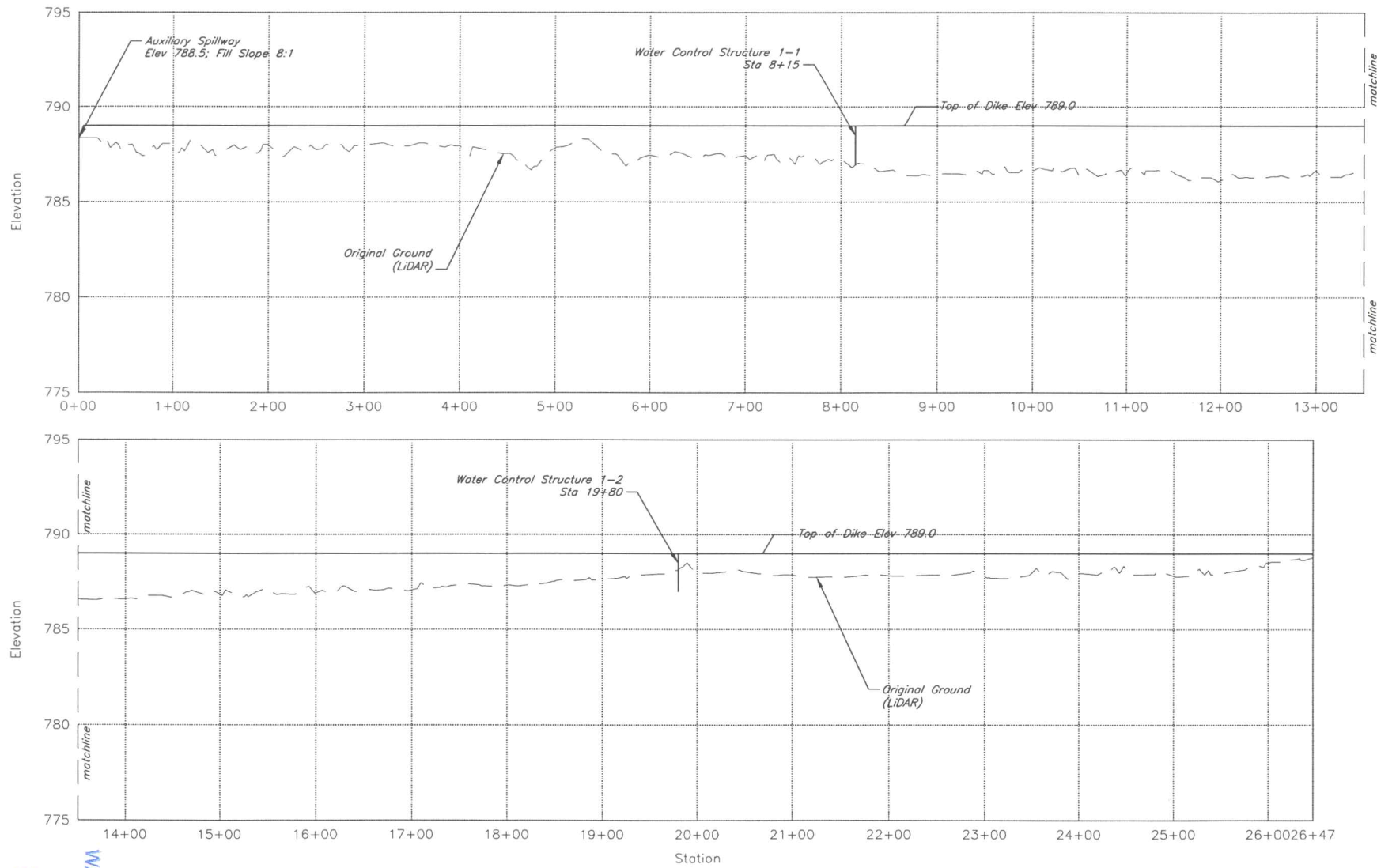
Dike 3 and Dike 4 Plan View and Storage Tables

Date 02/24  
 Designed B. Severin  
 Drawn B. Severin  
 Checked M. Miller  
 Approved B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
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Profile View of Dike 1

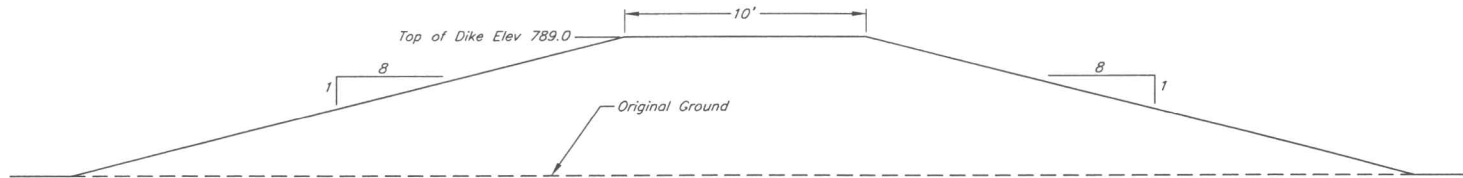
Dike 1 Profile

Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

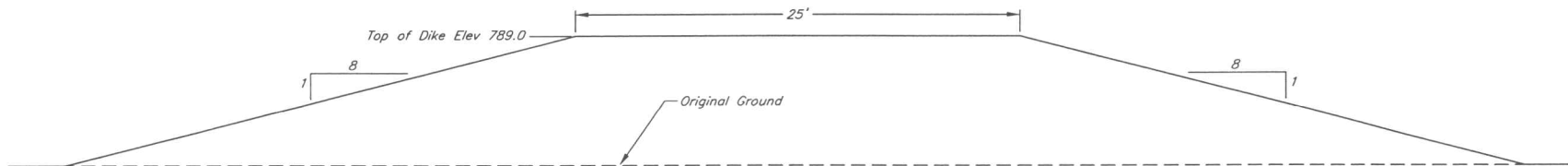
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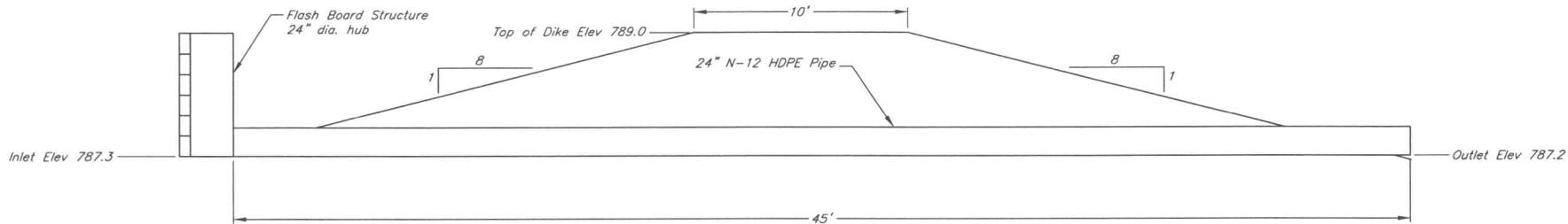




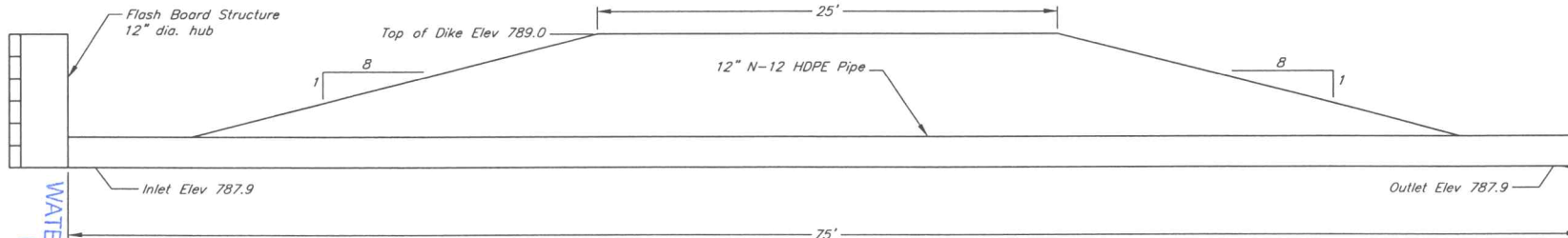
Typical Dike 1 (Station 0+00 - 19+25) Cross Section



Typical Dike 1 (Station 19+25 - 26+47) Cross Section



Water Control Structure 1-1 (Station 8+15) Cross Section



Water Control Structure 1-2 (Station 19+80) Cross Section

Dike 1 Cross Sections

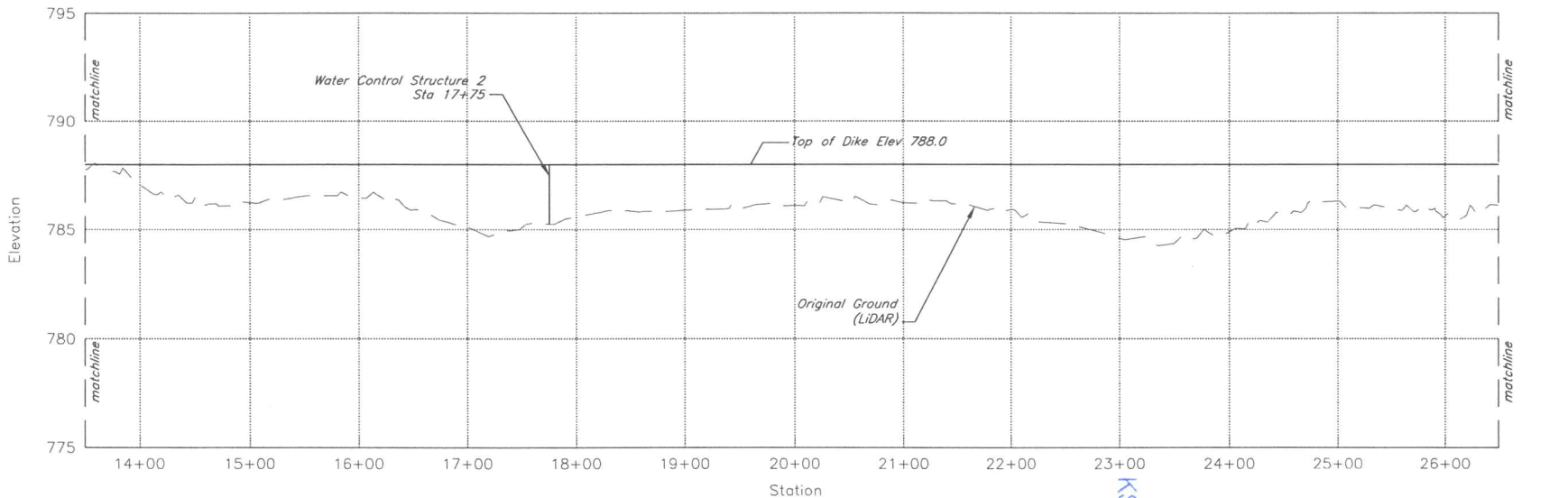
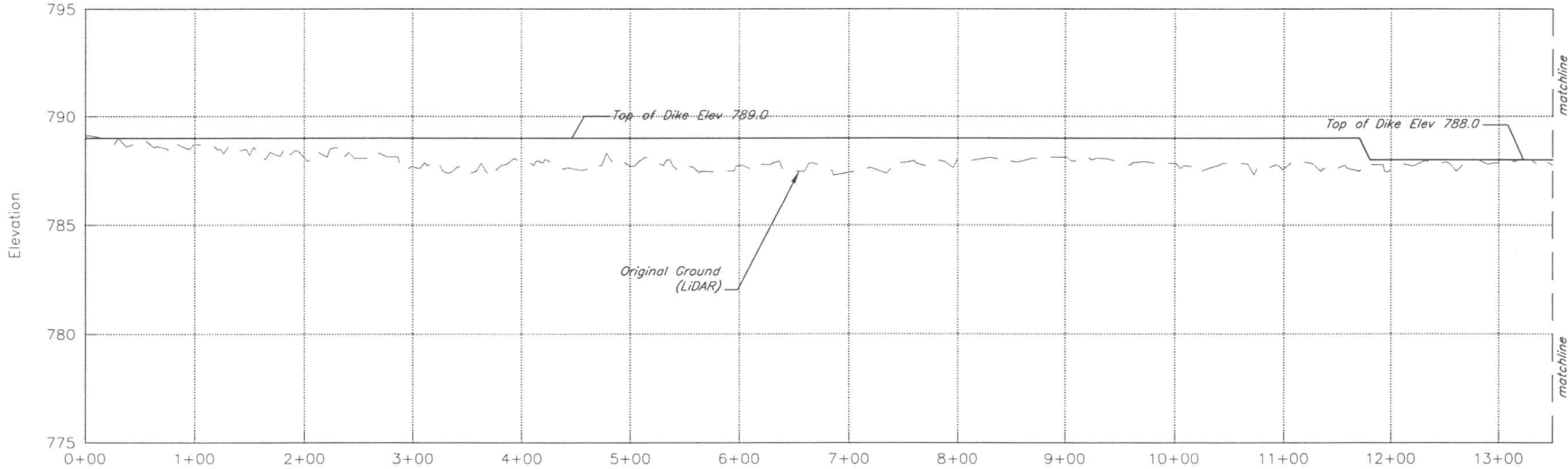
Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

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Profile View of Dike 2

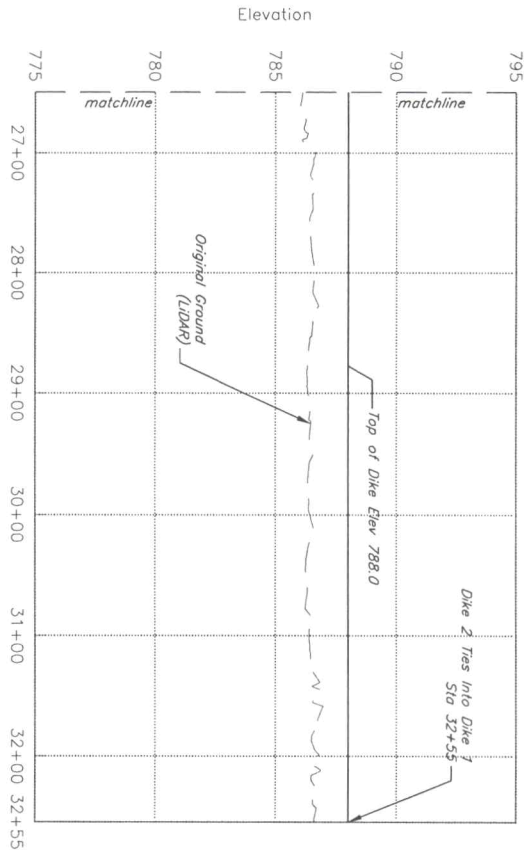
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Dike 2 Profile

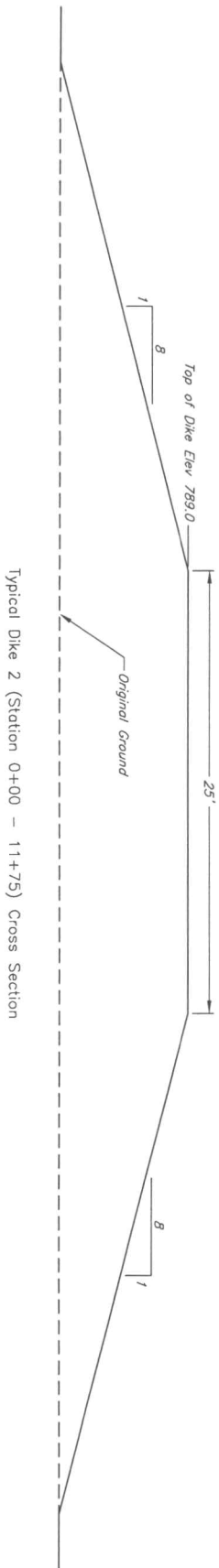
Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

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 Sheet 8 of 16



Profile View of Dike 2



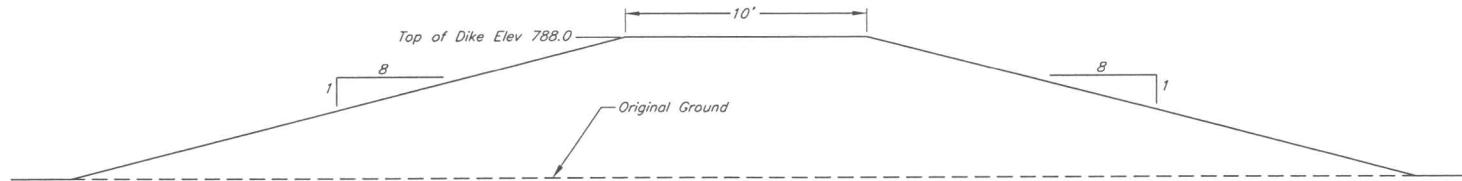
Typical Dike 2 (Station 0+00 - 11+75) Cross Section

Dike 2 Profile and Cross Section

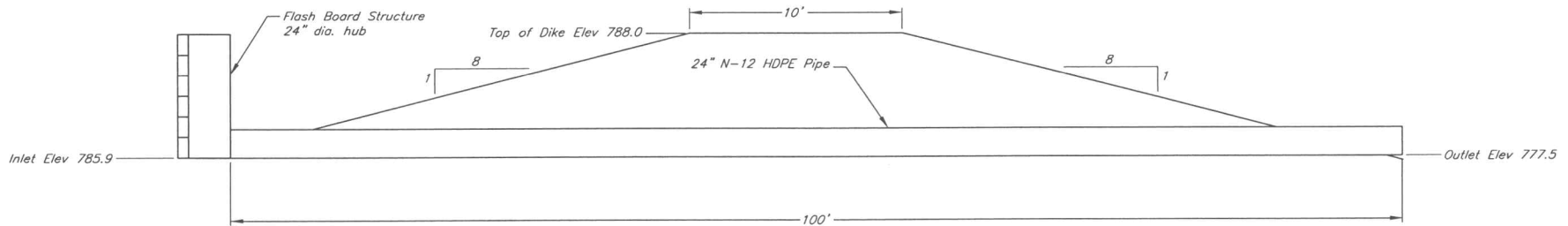
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Typical Dike 2 (Station 11+75 - 32+55) Cross Section



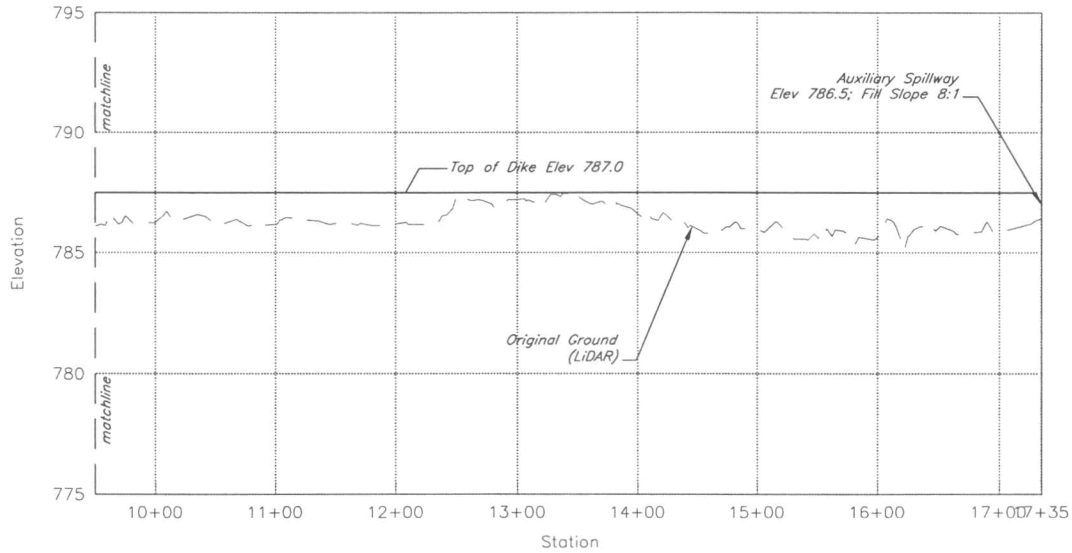
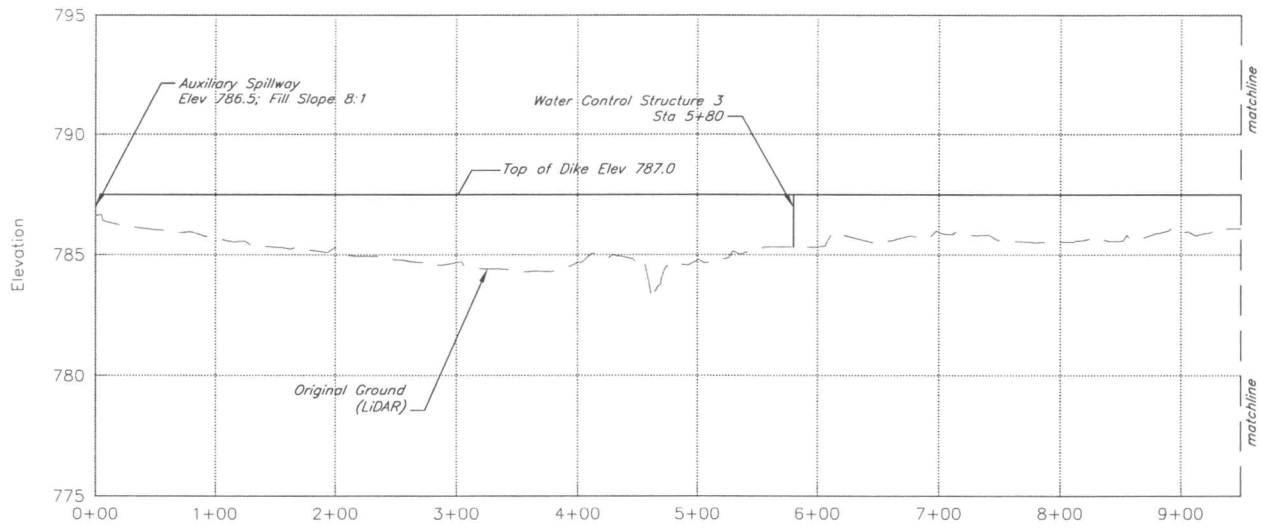
Water Control Structure 2 (Station 17+75) Cross Section

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Dike 2 Cross Sections

Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas



Profile View of Dike 3

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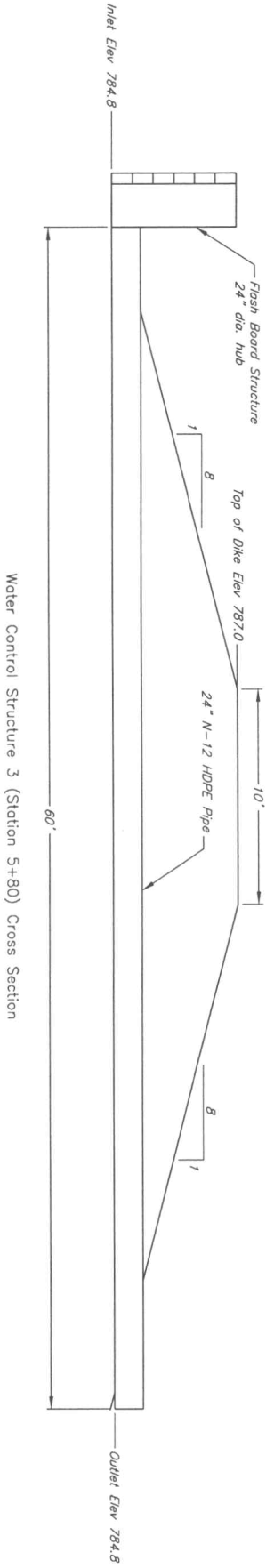
WATER RESOURCES  
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Designed	B. Severin	Date	02/24
Drawn	B. Severin	Checked	M. Miller
Checked	M. Miller	Approved	B. Severin
Approved	B. Severin		03/24

Keeling Land & Cattle-KS/CO LLC  
Wetland Development (As Constructed)  
NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
Chautauqua County, Kansas

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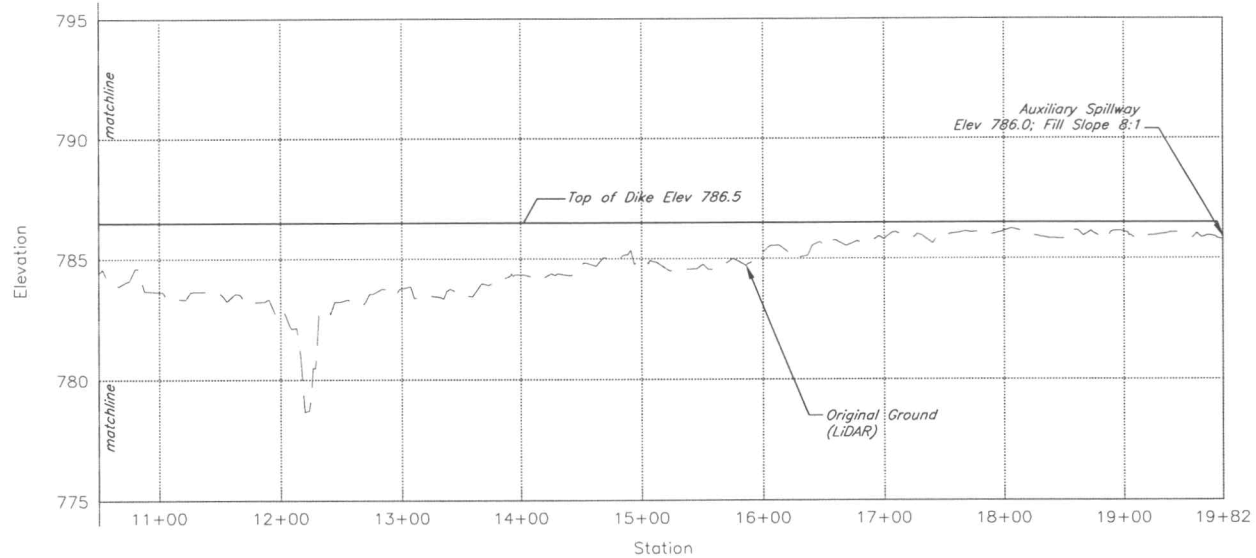
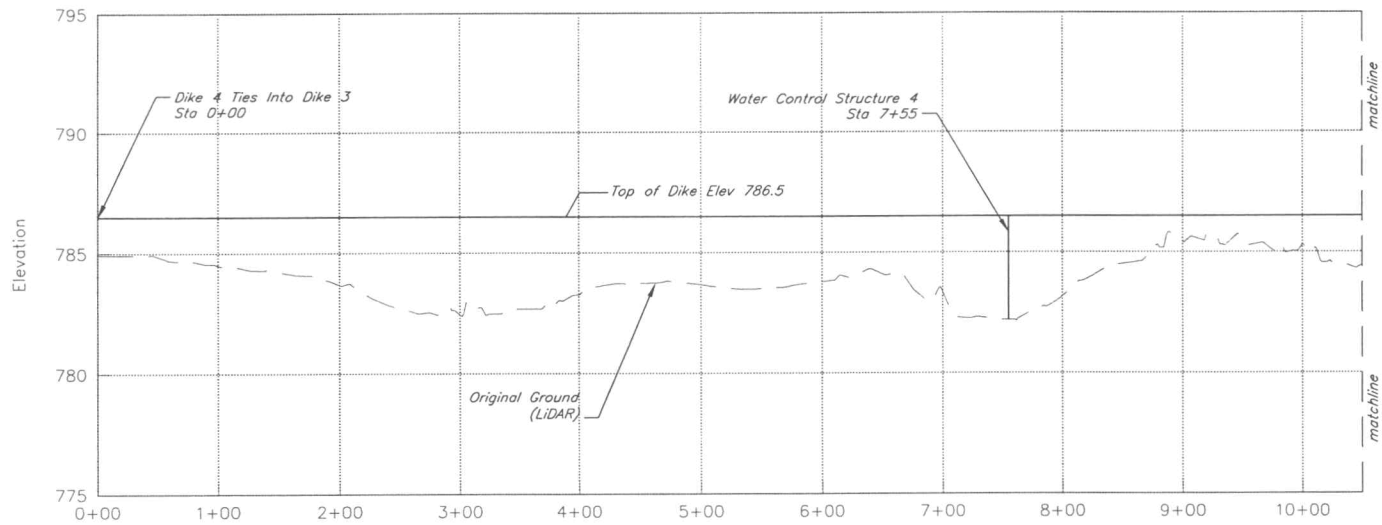




*Dike 3 Cross Sections*

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 <b>SUSTAINABLE</b> Environmental Consultants	Keeling Land & Cattle-KS/CO LLC Wetland Development (As Constructed) NW4 16 - 34S - 12E & SE4 17 - 34S - 12E Chautauqua County, Kansas		Date <u>02/24</u>
	Designed <u>B Severin</u>		<u>03/24</u>
	Drawn <u>B Severin</u>		<u>03/24</u>
	Checked <u>M Miller</u>		<u>03/24</u>
	Approved <u>B Severin</u>		<u>03/24</u>



Profile View of Dike 4

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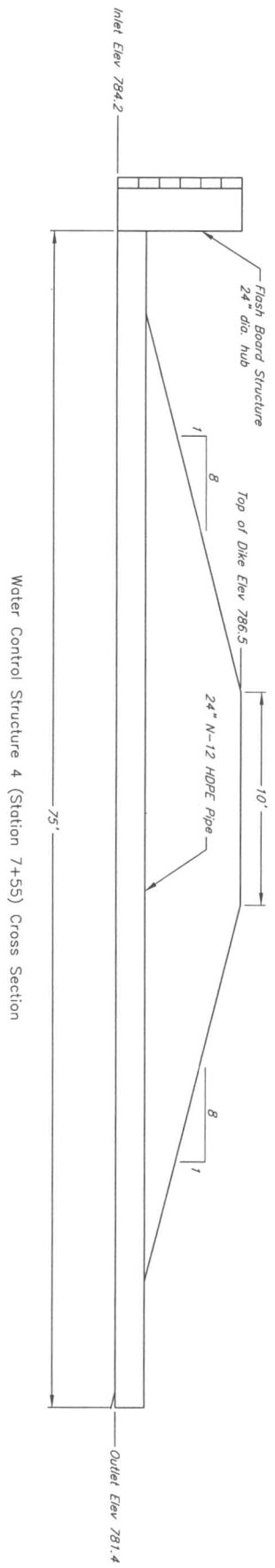
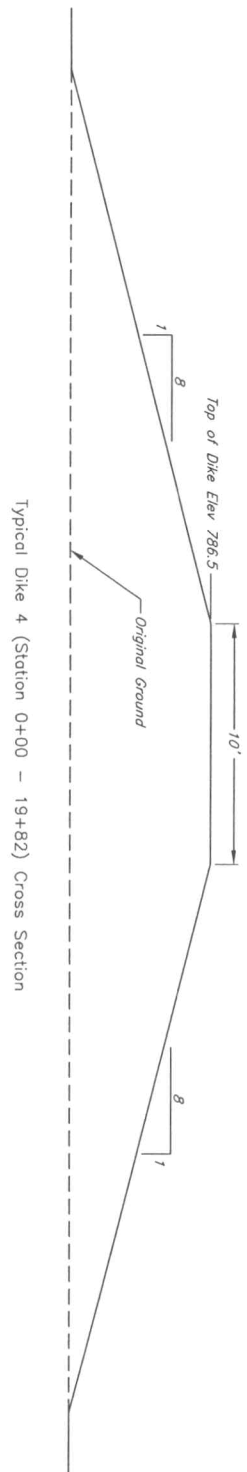
Dike 4 Profile

Designed	B. Severin	Date	02/24
Drawn	B. Severin	03/24	
Checked	M. Miller	03/24	
Approved	B. Severin	03/24	

Keeling Land & Cattle-KS/CO LLC  
Wetland Development (As Constructed)  
NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
Chautauqua County, Kansas

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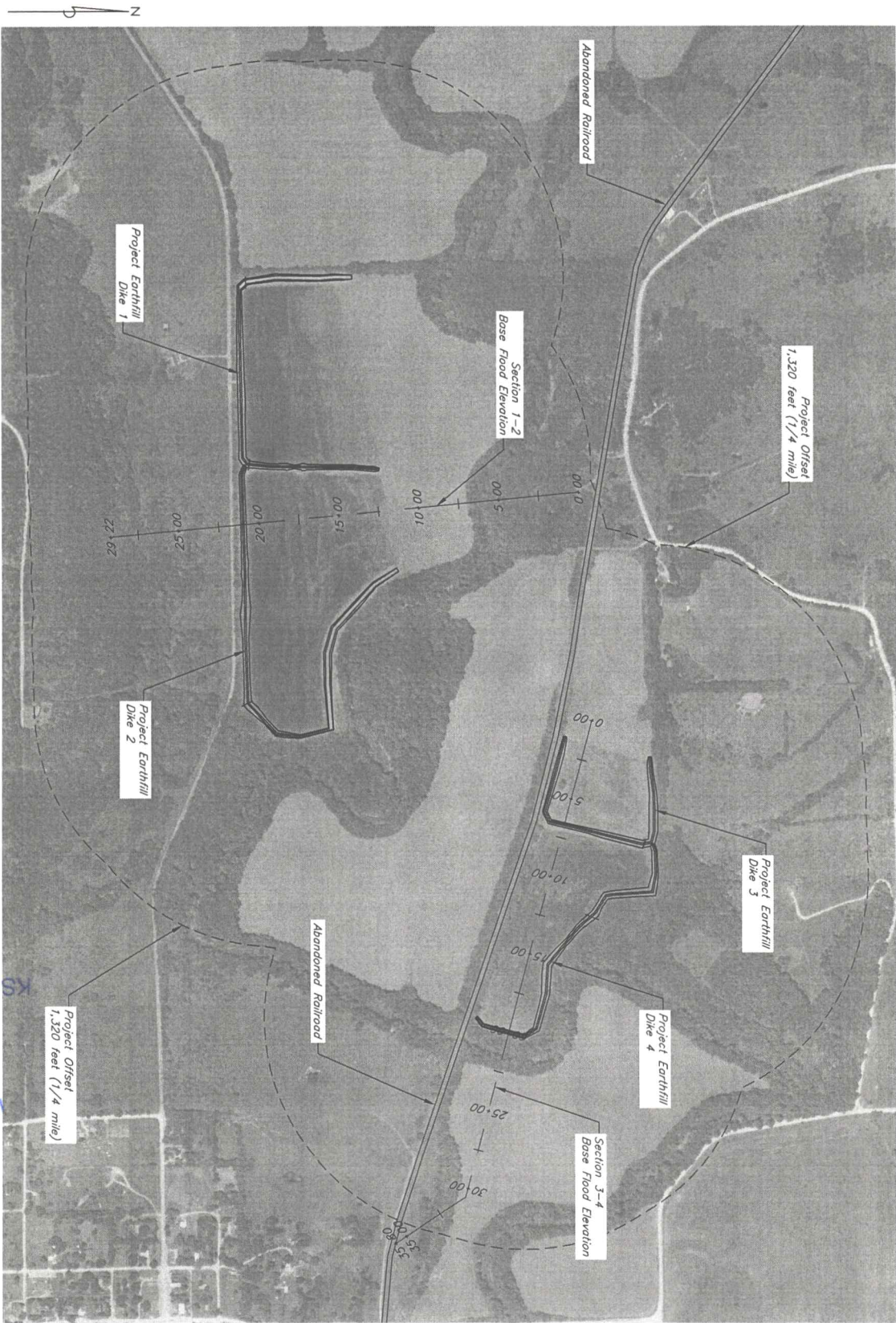
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Dike 4 Cross Sections

	Keeling Land & Cattle-KS/CO LLC Wetland Development (As Constructed) NW4 16 - 34S - 12E & SE4 17 - 34S - 12E Chautauqua County, Kansas		Date <u>02/24</u>
	Designed <u>B Severin</u>		Date <u>03/24</u>
	Drawn <u>B Severin</u>		Date <u>03/24</u>
	Checked <u>M Miller</u>		Date <u>03/24</u>
	Approved <u>B Severin</u>		Date <u>03/24</u>



Base Flood Analysis

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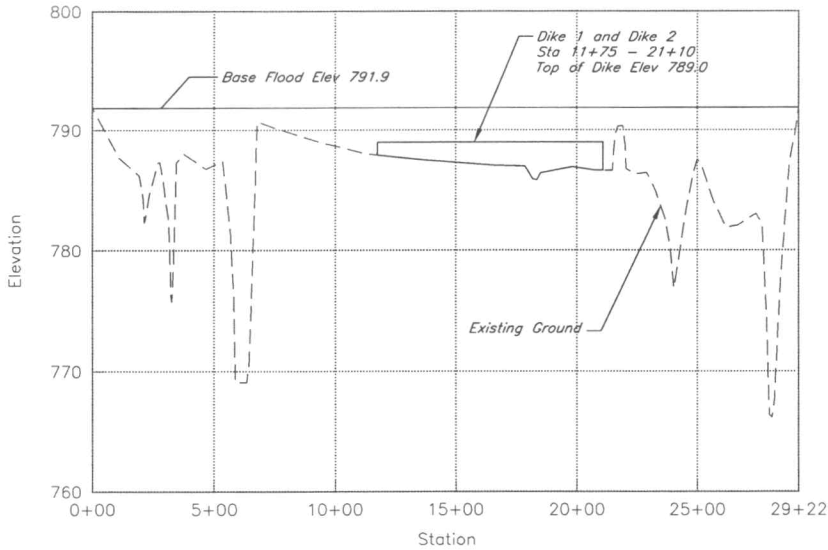


Sheet 15 of 16

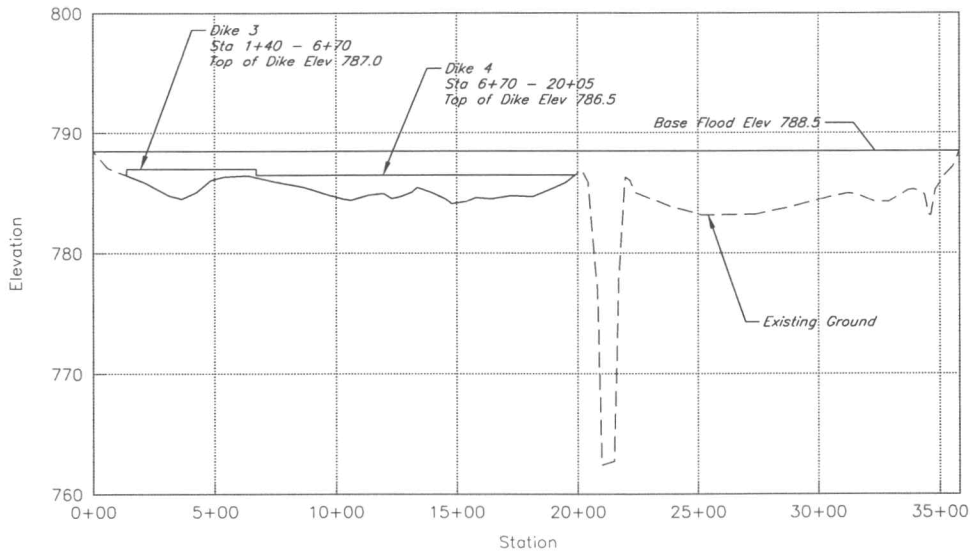
Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

		Date
Designed	B Severin	02/24
Drawn	B Severin	03/24
Checked	M Miller	03/24
Approved	B Severin	03/24





Section 1-2 - Base Flood Elevation



Section 3-4 - Base Flood Elevation

**References:**

Existing ground and channels: LiDAR Topographic Data and the U.S. Geological Survey (USGS) 7.5 minute quadrangle map

Base Flood Elevation Determination: Cheyenne Sun Eagle, KDA - Division of Water Resources and William Pace, KDA - Division of Water Resources

**Notes:**

1. FEMA Zone A Floodplain: No current FEMA Zone A floodplain maps exist for Chautauqua County
2. No DWR permitted floodplain fills are located within 1/4 mile of the dike location. Therefore, a geometric base flood analysis was completed.
3. Two geometric cross sections were completed for this project. The abandoned railroad fill between the two wetland cells creates a large change in base flood elevation.

**Section 1-2:**

Base flood elevation = 791.9  
 Base flood section area = 17,700 sq. ft.  
 Top width of base flood section = 2,922 ft  
 Maximum earthfill area below base flood elevation = 1,780 sq. ft.

Earthfill will increase base flood area by 10%  
 Earthfill will increase base flood elevation by 0.61 ft.

**Section 3-4:**

Base flood elevation = 788.5  
 Base flood section area = 14,600 sq. ft.  
 Top width of base flood section = 3,580 ft  
 Maximum earthfill area below base flood elevation = 2,650 sq. ft.

Earthfill will increase base flood area by 18%  
 Earthfill will increase base flood elevation by 0.74 ft.

Base Flood Analysis Completed By: Brian W Severin Date: 3/12/24

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Base Flood Analysis

Date	02/24
Designed	B. Severin
Drawn	B. Severin
Checked	M. Miller
Approved	B. Severin

Keeling Land & Cattle-KS/CO LLC  
 Wetland Development (As Constructed)  
 NW4 16 - 34S - 12E & SE4 17 - 34S - 12E  
 Chautauqua County, Kansas

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**KDA – Division of Water Resources (DWR) Project Report**

**Surface Water Storage**

The Potential Net Evaporation (Annual Average Evaporation minus Annual Normal Precipitation) for the project location is 9 inches. The net storage for Dike 1, Dike 3, and Dike 4 was analyzed from the auxiliary spillway. The net storage for Dike 2 was analyzed from the top of dam, as there is not a constructed auxiliary spillway. Water control structures will be used in all dikes to maintain freeboard and manage the water level within the wetland cells. The Total Storage + Net Evaporation for Dike 1 and Dike 2 (shared drainage area) is greater than 15 ac-ft. The Total Storage + Net Evaporation for Dike 3 and Dike 4 (shared drainage area) is greater than 15 ac-ft. Therefore, a DWR Water Appropriation for Beneficial Use (Storage) permit will be required.

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
787.0	0.41	0.00	0.00
787.5	4.55	1.24	4.66
788.0	8.69	4.55	11.07
788.5 (Auxiliary Spillway)	17.35	11.06	24.08
789.0 (Top of Dike)	20.61	20.55	36.01

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
785.0	0.10	0.00	0.00
785.5	0.72	0.21	0.74
786.0	2.15	0.92	2.54
786.5	3.93	2.44	5.39
787.0	9.21	5.73	12.64
787.5	17.60	12.43	25.63
788.0 (Top of Dike)	24.56	22.97	41.39

Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
783.5	0.01	0.00	0.00
784.0	0.28	0.07	0.28
784.5	0.96	0.38	1.10
785.0	2.09	1.14	2.71
785.5	3.36	2.50	5.02
786.0	5.10	4.62	8.44
786.5 (Auxiliary Spillway)	6.79	7.59	12.68
787.0 (Top of Dike)	8.02	11.29	17.31

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Dike 4 Stage Storage Table			
Elevation (ft)	Area (ac)	Total Storage (ac-ft)	Total Storage + Net Evaporation (ac-ft)
783.0	0.16	0.00	0.00
783.5	0.45	0.15	0.49
784.0	1.36	0.61	1.63
784.5	3.34	1.78	4.29
785.0	8.11	4.65	10.73
785.5	12.54	9.81	19.22
786.0 (Auxiliary Spillway)	14.68	16.62	27.63
786.5 (Top of Dike)	15.51	24.16	35.80

### Direct Diversion

The proposed pumping sites will control and maintain the wetland hydrology. The pumping sites are located as shown on the plan sheets, with the water source being the Middle Caney Creek. Therefore, a Water Appropriation for Beneficial Use (Direct Diversion) permit will be required. This permit application was submitted by the previous landowner.

### Base Flood Analysis

The project is located within the flood boundary of the Middle Caney Creek. Therefore, a floodplain fill permit will be required. A base flood analysis was completed to determine the increase in base flood area and flood elevation. The elevation of the existing ground, previously constructed dikes, and channels was approximated from Kansas LiDAR topographic data and the U.S. Geological Survey (USGS) 7.5-minute quadrangle map. The Base Flood Elevation (BFE) for the project location was determined by Cheyenne Sun Eagle, KDA-DWR and William Pace, KDA-DWR. There are no current FEMA Zone A floodplain maps for Chautauqua County. There are no permitted floodplain fills located within ¼ mile of the dike locations. Therefore, geometric analysis was completed. Two cross sections were completed, as the abandoned railroad fill between the two wetland cells creates a large change in base flood elevation. For Section 1-2, the proposed dike earthfill will increase the base flood area by 10% and the base flood elevation by 0.61 feet. For Section 2-3, the proposed dike earthfill will increase the base flood area by 18% and the base flood elevation by 0.74 feet. See Base Flood Analysis plan sheets for further detail.