

WATER PERMIT NO. 2445-2

Name of Applicant: **Bloom Family LTD. Partnership**

Address: **16501 Indian Creek Rd, Scenic SD 57780**

Phone: **605 343-0025**

Amount of Water Claimed: **46.9 acre feet**

Total Acres: **NA**

Source of Water Supply: **runoff**

Water to be used for: **fish & wildlife propagation and livestock**

County: **Pennington**

Type of Waste Disposal System:

Location: **8 mile northwest of Scenic**

PRIORITY Date Received: **8-21-2000**

Fee: **\$150**

Corrected Application Received: **8-31-2000**

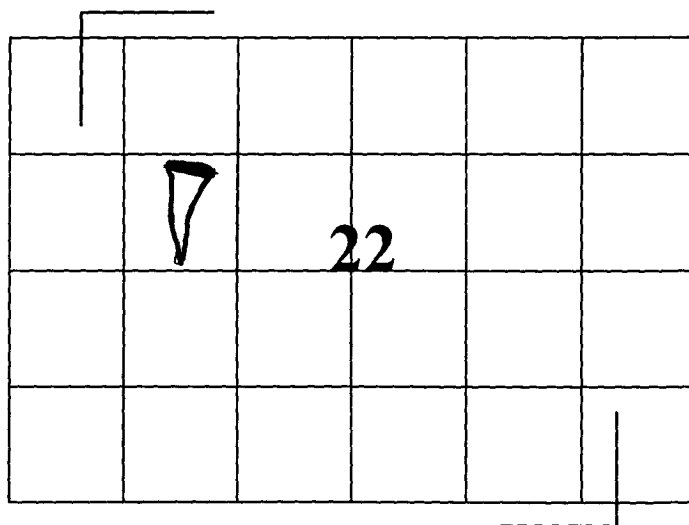
Period of Annual Use: **January 1 – December 31**

Remarks:

Diversion Point: **SW ¼ NW ¼ Sec 22-T2S-R12E**

Water Impounded: **SW ¼ NW ¼**

Sec 22-T2S-R12E



Depth of Well: **NA**

Well Driller: **NA**

Remarks:

Type of Map: **topo**

Prepared by: **Gerald L Magelky, NRCS**

Reviewed and the Number Assigned on: **8-31-2000**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 2445-2**

Date of first receipt of application August 21, 2000.

Date of return to applicant for corrections, amendments or changes August 21, 2000.

Date of receipt of corrected application August 31, 2000.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2445-2 to Bloom Family LTD. Partnership, 16501 Indian Creek Rd., Scenic SD 57780 authorizing the construction of the dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 2445-2 authorizes impoundment of 47 acre-feet of water from runoff by constructing a dam located in the SW ¼ NW ¼ Section 22 with water impounded in the SW ¼ NW ¼ Section 22; all in T2S-R12E.
2. The water appropriated shall be used for the purpose of supplying water for fish & wildlife propagation and livestock watering and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 2445-2 is October 16, 2000.
5. The date from which applicant may claim right is August 21, 2000.
6. One-fifth of the construction is to be completed on or before April 16, 2003.
7. All construction is to be completed on or before October 16, 2005.
8. Water is to be put to beneficial use on or before October 16, 2009.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Water Permit No. 2445-2 authorizes a dam with a storage capacity of 47 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: Garland Erbele
Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

NOV 15 2000

date



(type or print)

No. 2445-2 Hydrologic Unit 10120109
Basin Upper Cheyenne
Newspaper Rapid City Journal (office use only)



☐ Municipal	☐ Suburban Housing	☐ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☒ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic	☐ Industrial	☒ Other	<u>Livestock</u>

(over 18 gpm)

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

- See Attached Plans

Signed

Signed Deanne Bloom
for me this 18 day of August 19 2000
Expires 5/19/06 Deanne A. Bloss Notary Public

Supplemental Information

(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack Thickness _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:
On applicants property _____ On property owned by others _____

2. Dugout Information

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:

Gerard L. Magelky, CET
NRCS
PO Box 457, Kadoka, SD 57543-0457

b) Freeboard _____ 3 Feet

c) Crest Width _____ 12 Feet

Crest Length _____ 325 Feet

d) Height _____ 21 Feet

e) Primary Outlet Capacity _____ 102 CFS

If pipe, diameter _____ 30"

f) Secondary Spillway Capacity _____ 500 CFS

Spillway Width _____ 75 Feet

g) X & Y Slope

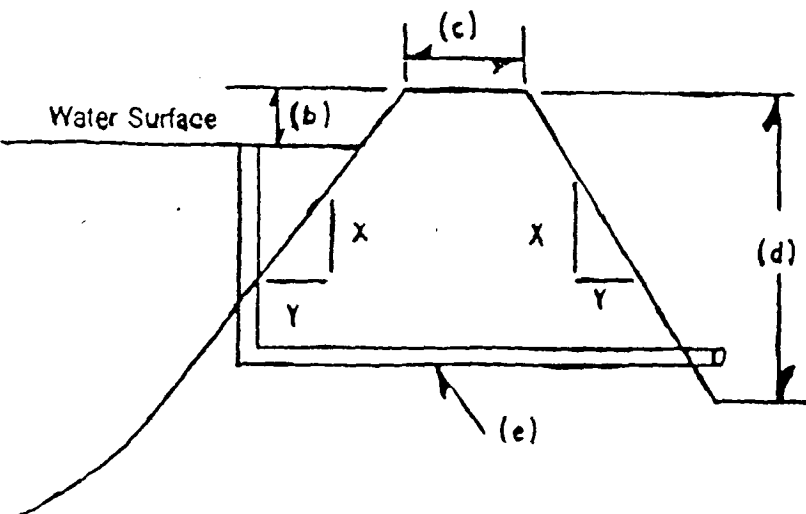
Upstream _____ 3:1

Downstream _____ 2:1

h) Surface Area of Impoundment _____ 4.9 Acres

i) Storage _____ 46.9 _____ Acre Feet

j) Drainage Area Above Dam _____ 2498 _____ Acres



⁶⁸⁸ Kzdkuz, S. D.

08/15/2000

~~Proposed~~
~~Demo~~

T25
R12E

SPENIC SW

Penn. & Co

2445-2

James J. M. G. G.
CET. NRCS
Kidoke S.D.
08/15/00

T2S
R12E

22

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

Nº 416606

Pierre, ~~August 21, 2000~~, _____

RECEIVED OF Bloom Family Limited Partnership, 16501 Indian Creek Rd, Scenic SD 57780
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use _____	150	00
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	150 00

By

Chief Engineer

John Hatcher
/KS

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

N2 416617

Pierre, August 31, 2000

RECEIVED OF Bloom Family Limited Partnership, 16501 Indian Creek Rd, Scenic SD 57780
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct
and to put water to beneficial use _____

Fee for Application for Permit No. _____ to Appropriate Water, for Future
Use _____

Fee to retain Future Use Permit No. _____ after period of seven years.

Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water
License No. _____

Fee for Filing Transfer Form _____

Fee for Filing Extension Request _____

Fee for _____

(Any Other Work Provided by Law)

Total

50 00

By

Stanley E. Ebel

Chief Engineer

1/15



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

August 21, 2000

Bloom Family LTD. Partnership
Bernita Bloom
16501 Indian Creek Rd
Scenic SD 57780

Dear Ms. Bloom:

Thank you for submitting the *Application for a Permit to Appropriate Water* for a storage dam..

We have received the \$150 application filing fee. In addition to the application filing fee, the Water Rights Program collects the \$50 licensing fee at the time of filing. Please submit \$50 for the licensing of the water permit.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2445-2, Bloom Family LTD, Partnership**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 2445-2, Bloom Family LTD, Partnership, c/o Berneta Bloom, 16501 Indian Creek Road, Scenic, SD 57780.

The Chief Engineer is recommending APPROVAL of Application No. 2445-2 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 2445-2 authorizes a dam with a storage capacity of 47 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
September 19, 2000

REPORT ON
WATER PERMIT APPLICATION NO. 2445-2
Bloom Family LTD. Partnership
September 19, 2000

Water Permit Application No. 2445-2 has been filed by Bloom Family LTD. Partnership to impound 47 acre-feet of water from runoff by constructing a dam located in the SW 1/4 NW 1/4 of Section 22-T2S-R12E, in Pennington County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife propagation livestock watering.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. The Natural Resources Conservation Service (NRCS) has designed the project. The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 2445-2 is approved.

The Bloom Dam will be 21 feet high with a normal storage capacity of 47 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 74 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

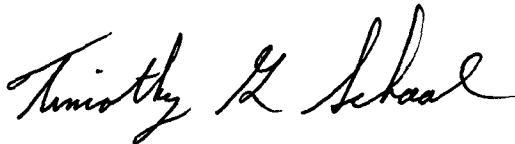
The dam has a drainage area of 3.90 square miles. A 25-year frequency event for this drainage area produces a peak runoff of approximately 700 cfs. A 50-year frequency event produces a peak of approximately 985 cfs. The dam is designed to have a 75 foot wide earcut spillway with 3 feet of available freeboard. The secondary spillway will have a capacity of approximately 1013 cfs.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 9 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 31 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 208 acre-feet.

The Bloom Dam will be located in the SW 1/4 NW 1/4 of Section 22-T2S-R12E on an unnamed tributary of Spring Draw about one-quarter mile upstream of its confluence with Spring Draw and one mile above the confluence of Spring Draw with the Cheyenne River. There are no existing Water Permits/Rights located on the unnamed tributary or Spring Draw between the proposed dam and the Cheyenne River.

Conclusions:

1. Water Permit Application No. 2445-2 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 2445-2.



Timothy G. Schaal, P.E.
Natural Resources Engineer III

Approved by:

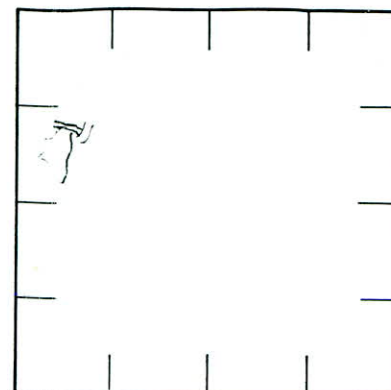


Gale N. Selken, P.E.
Natural Resources Engineer IV

STRUCTURE DATA

DRAINAGE AREA	ANNUAL YIELD	PEAK RUNOFF	EMERG. SPLWY. CAPACITY	WATER DEPTH	SURFACE AREA	SEDIMENT STORAGE	TOTAL STORAGE
ACRES	AC. FT.	25-YR.	C. F. S.	FEET	ACRES	AC. FT.	AC. FT.
2498	27	402	500	17	4.9	6.1	46.9

1600 S 97 Rods South
800 E 48 Rods East



Sec. 22 T. 25 S. R. 12 E
Penn. County

LOCATION

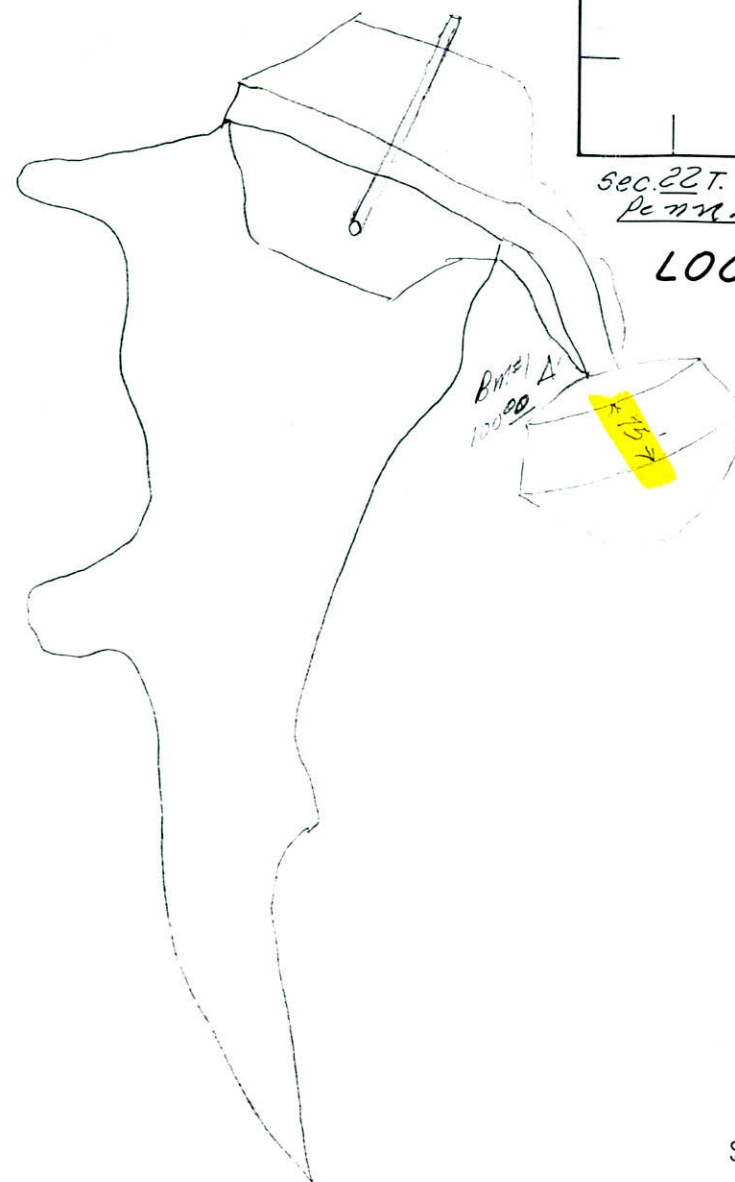
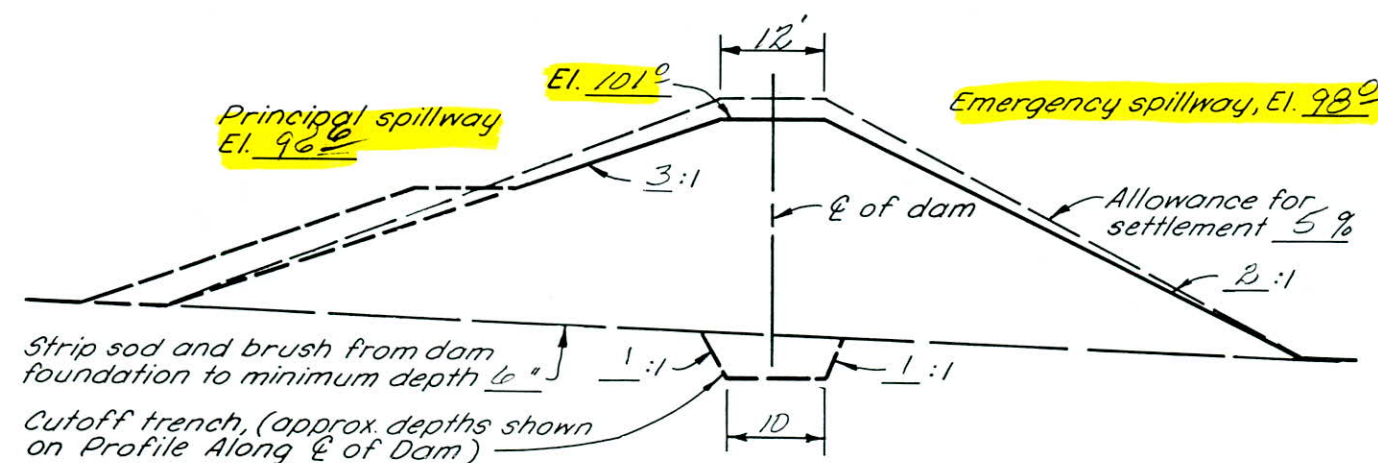


TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
Earth Fill Class - 5	cuyd	10,001
Excavation		
Core Trench 380 CY		
Em. Sp. Hwy 3500 CY		
Stripping 380 CY		
Drop Inlet 3.8CY Concrete Job Plan 5.4A	Ez	1
Reinforcing Steel	lbs	
Trash Rack & Ant. Vortex Job Plan 5.4B	Ez.	1
Pipe Support Job Plan 4.4	Ez	1
30" Double Wall HDPE Plastic Pipe	LF	80
9° Double Wall HDPE Plastic Elbow	Ez	1
Sand Ant. Seep Drain Job Plan 3.8P	Ez	1



TYPICAL CROSS SECTION OF DAM

S.D. CONSTRUCTION AND MATERIAL SPECIFICATIONS:

SD-4 Stripping
SD-5 Excavation
SD-7S Earth Fill-Class S
SD-12B Concrete for Minor Struct.
SD-13 Steel Reinforcement
RC-15 HDPE Pipe Conduits

EARTH DAM

OPERATOR: Bernice Bloomer
CONSERVATION DISTRICT: East Range

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

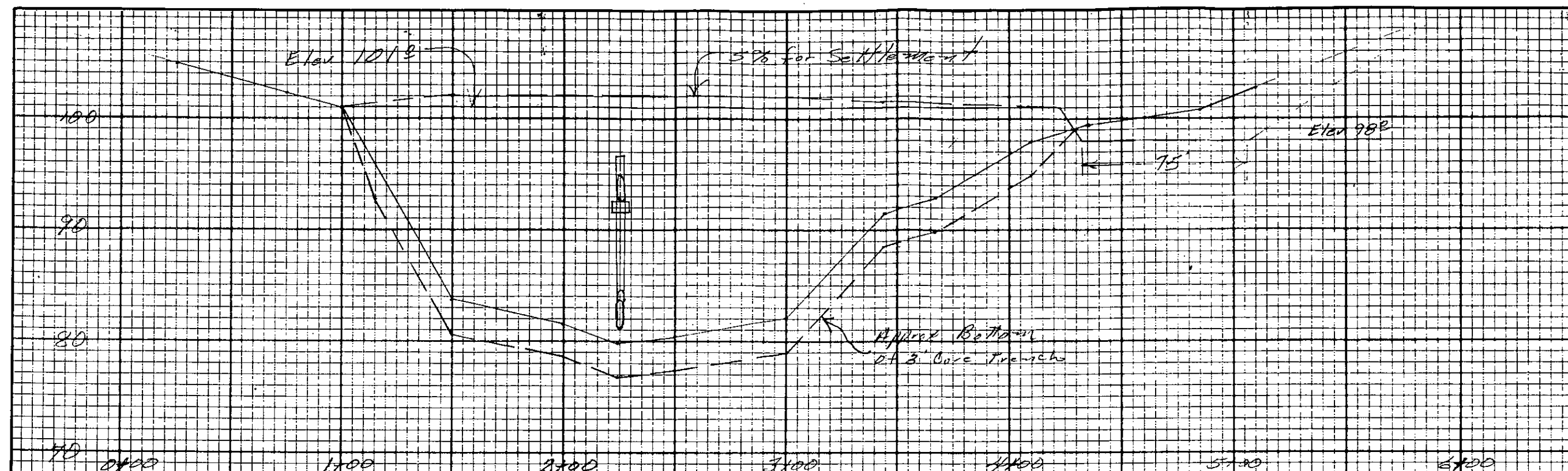
Date _____
 Designed C. L. Magelky 400 Approved by [Signature]
 Title Ag. Engineering
 Drawn _____
 Traced _____
 Title _____
 Sheet _____ Drawing No. _____
 No. 1
2445-1
 Checked _____

SKETCH PLAN OF DAM AND RESERVOIR AREA

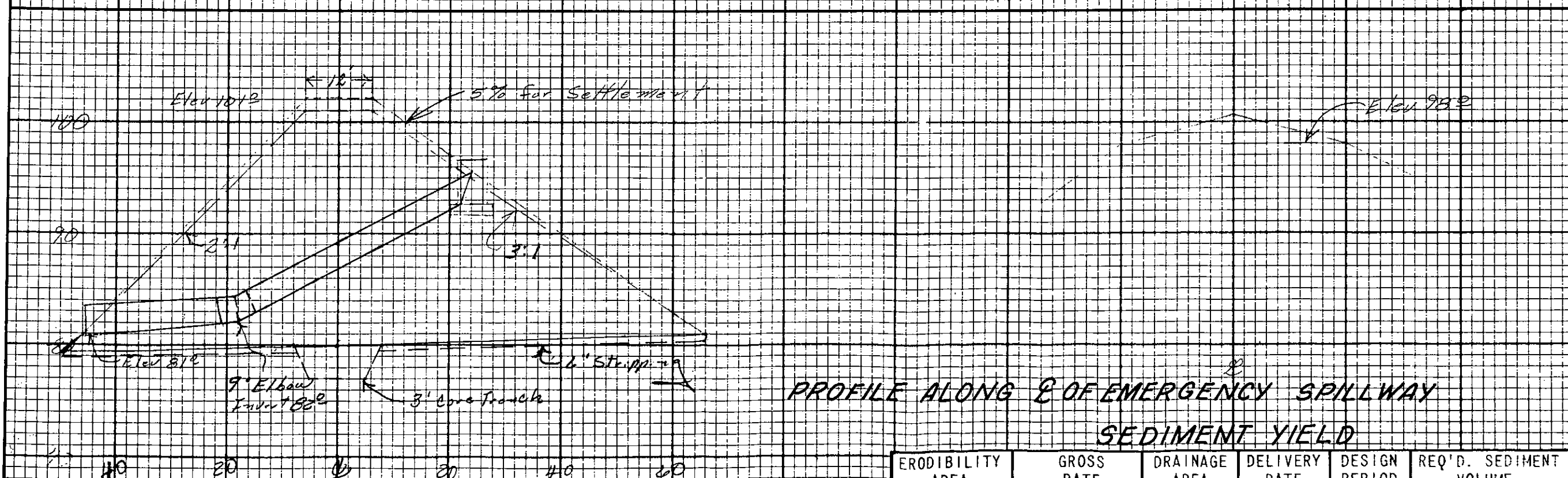
Approximate scale $1'' = 250'$

REFERENCE: GUIDE PLAN NO. 1.0

JOB PLAN NO. 1.0



CROSS SECTION AT CREST OF EMERGENCY SPILLWAY AND PROFILE ALONG C OF DAM

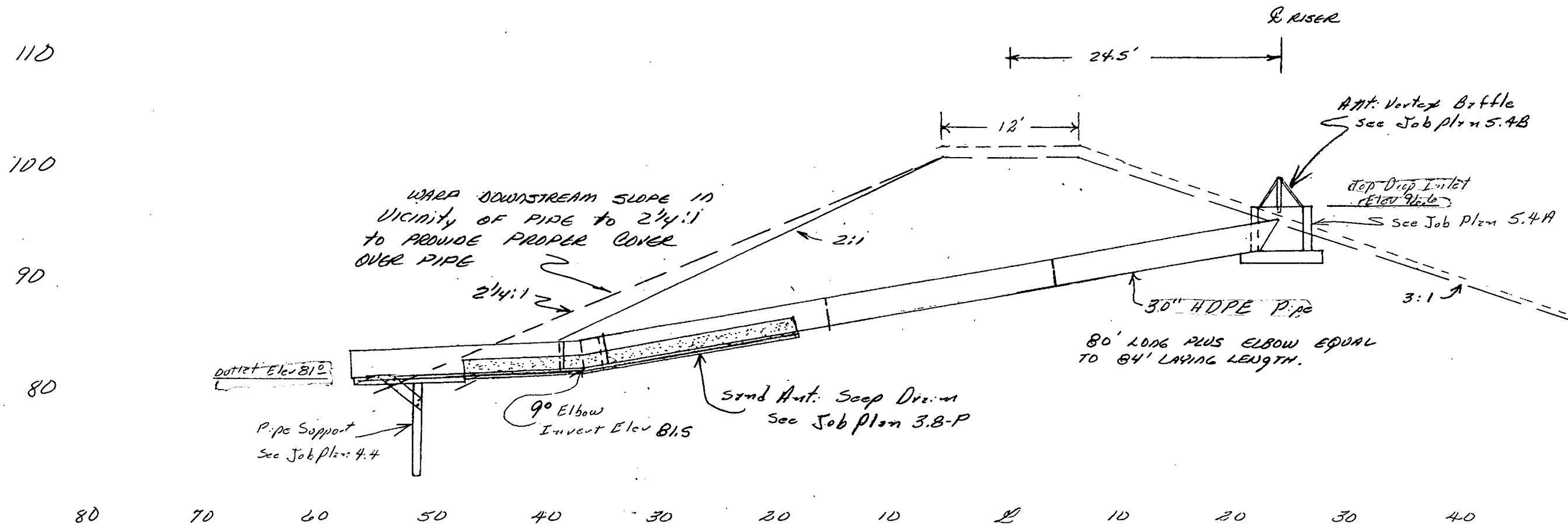


PROFILE ALONG C OF EMERGENCY SPILLWAY

SEDIMENT YIELD

MAXIMUM CROSS SECTION OF DAM
STA 2+23

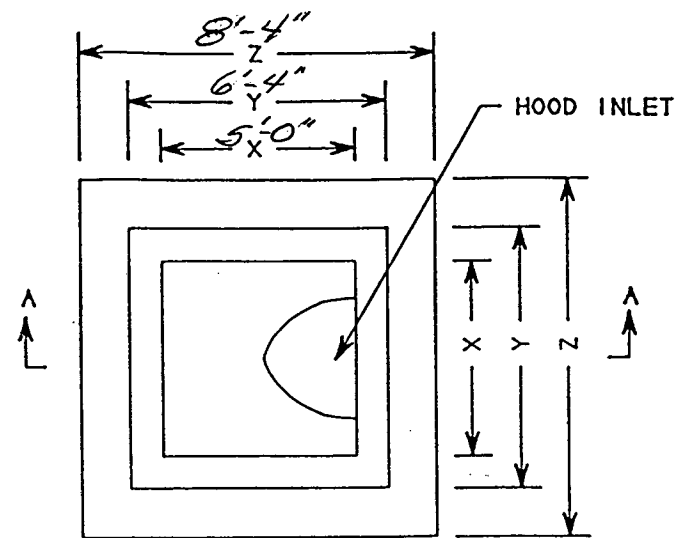
ERODIBILITY AREA ACRES	GROSS RATE A.F./AC./YR.	DRAINAGE AREA ACRES	DELIVERY RATE %	DESIGN PERIOD YEARS	REQ'D. SEDIMENT VOLUME AC.FT.
P 375	.0027	2498	24	25	6.1



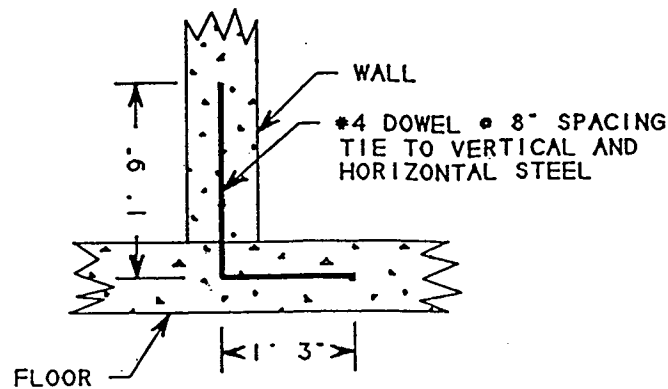
Bernice Bloom

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

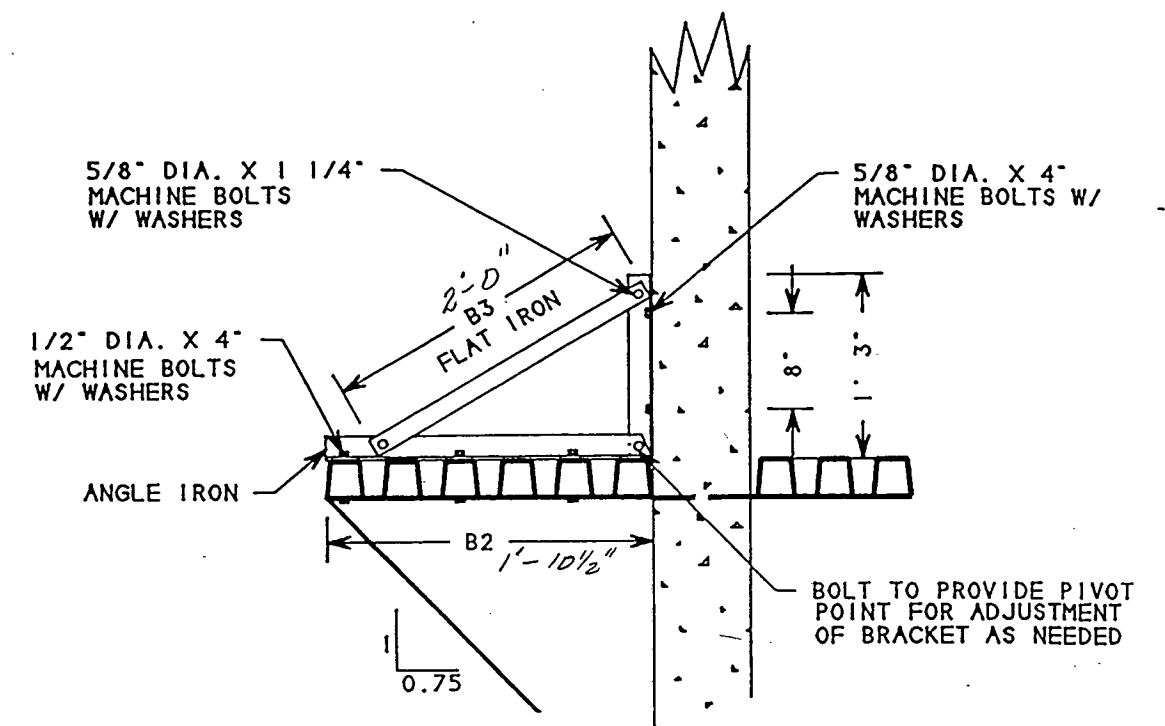
Designed by <u>C. L. M. H. H.</u>	Date <u>4/80</u>	Approved by _____
Drawn _____	Title _____	
Traced _____	Title _____	
Checked _____	Sheet No. <u>2</u>	Drawing No. _____
	of <u>6</u>	



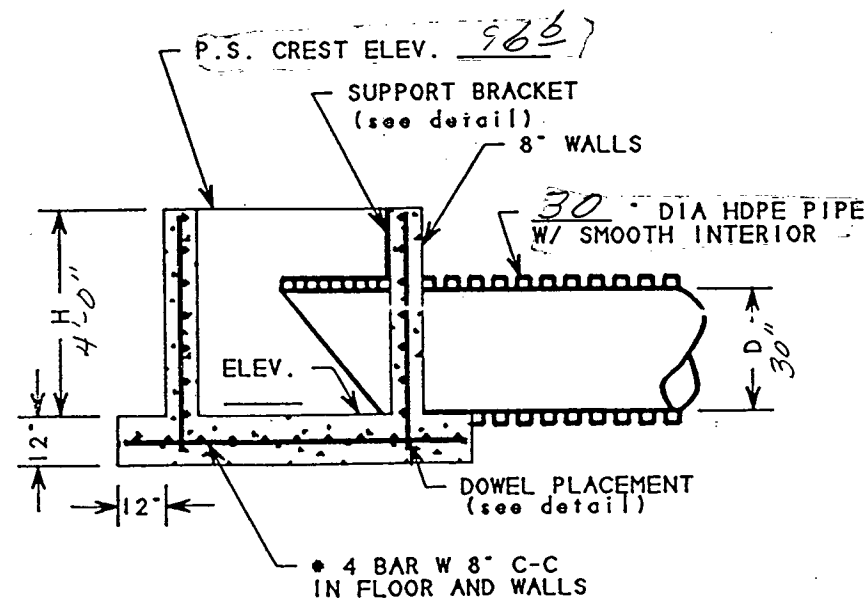
PLAN VIEW



DOWEL DETAIL



SUPPORT BRACKET DETAIL



SECTIONAL ELEV. A-A

BARREL DIA. D	FT.-IN. X	FT.-IN. Y	FT.-IN. Z	FT.-IN. H	CONCRETE CU.YDS.	SUPPORT BRACKET			BOLTS W/ WASHERS & NUTS		
						2" X 2" 1/4" ANGLE IRON LENGTH FT.-IN.	1/4" X 2" FLAT IRON LENGTH FT.-IN. B2	1/4" X 2" FLAT IRON LENGTH FT.-IN. B3	1/2" DIA X 4"	5/8" DIA X 1 1/4"	5/8" DIA X 4"
10"	3'-0"	4'-4"	6'-4"	3'-0"	2.6	1'-3"	7 1/2"	1'-3"	2	3	2
12"	3'-0"	4'-4"	6'-4"	3'-0"	2.6	1'-3"	9"	1'-4"	2	3	2
15"	3'-0"	4'-4"	6'-4"	3'-0"	2.6	1'-3"	11 1/4"	1'-5"	2	3	2
18"	3'-0"	4'-4"	6'-4"	3'-0"	2.6	1'-3"	1'-1 1/2"	1'-6"	2	3	2
24"	3'-0"	4'-4"	6'-4"	4'-0"	2.9	1'-3"	1'-6"	1'-9"	3	3	2
30"	5'-0"	6'-4"	8'-4"	4'-0"	4.8	1'-3"	1'-10 1/2"	2'-0"	3	3	2
36"	4'-6"	5'-10"	7'-10"	4'-6"	4.6	1'-3"	2'-3"	2'-4"	3	3	2

NOTE: 1. CONCRETE AROUND PIPE NEEDS TO BE VIBRATED TO INSURE A GOOD SEAL AROUND PIPE.

2. CONSTRUCTION JOINT BETWEEN WALLS AND FLOOR OF CONCRETE RISER WILL HAVE #4 DOWELS • MAX. 8" SPACING.

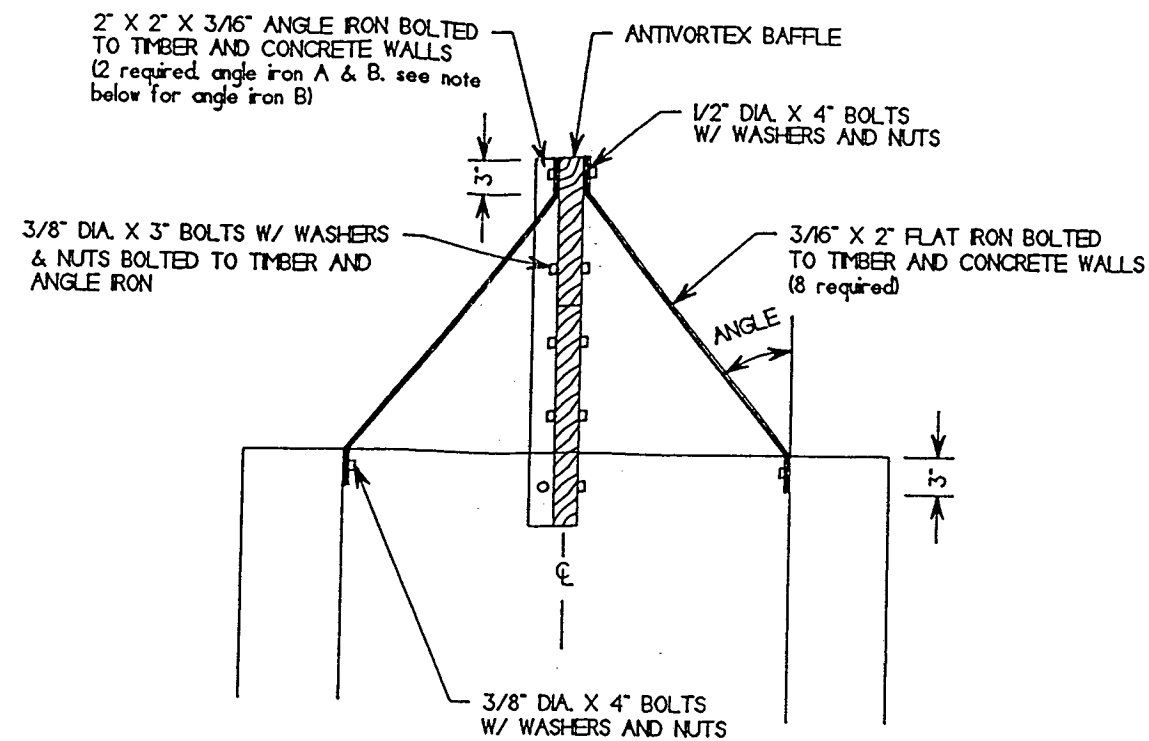
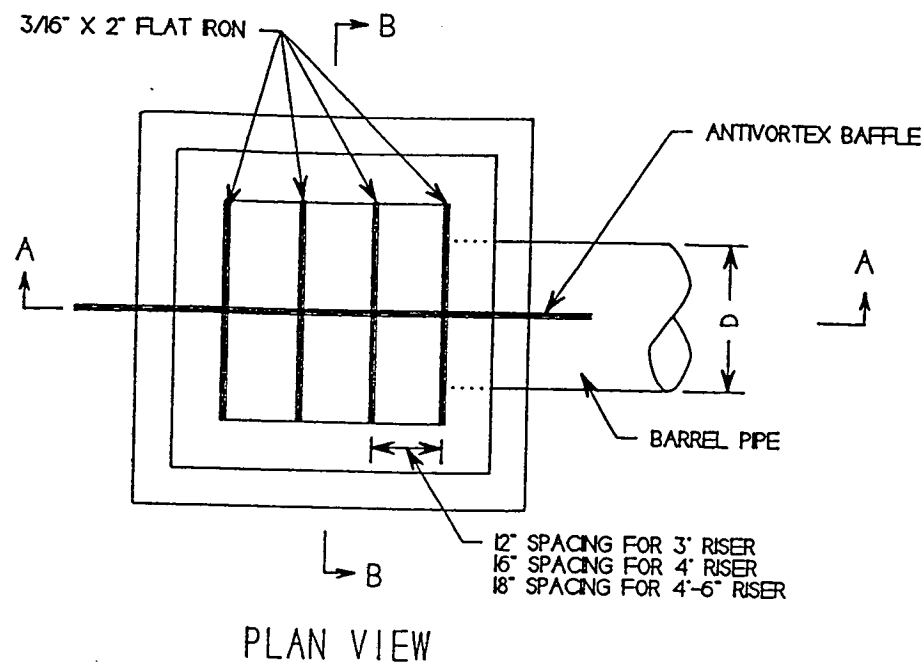
3. PE DOUBLE WALL CORRUGATED PIPE W/ SMOOTH INTERIOR (AASHTO M294 TYPE S) WITH BELL & SPIGOT JOINT AND WATERTIGHT GASKET.

CONCRETE RISER
AND POLYETHYLENE
HOOD INLET COMBINATION

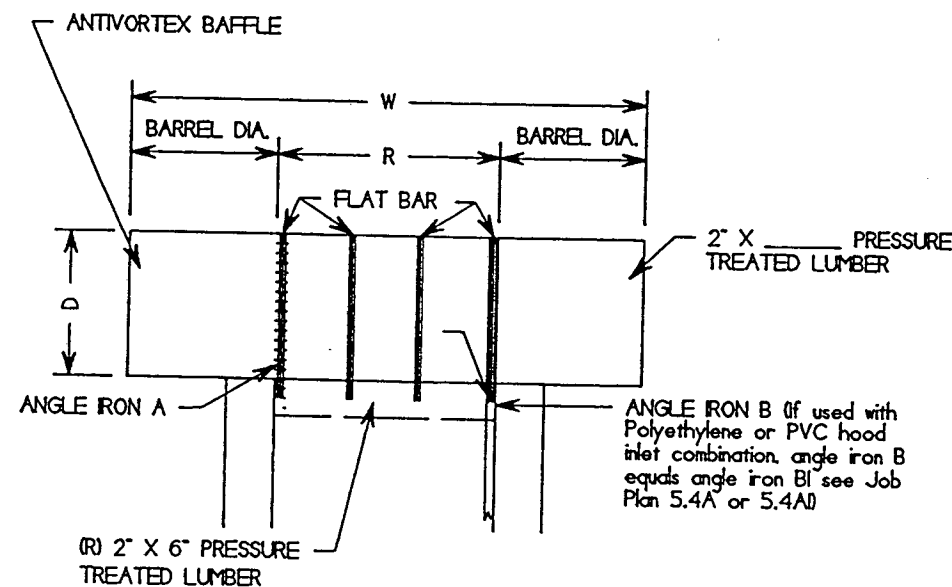
Bernita Bloom

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DESIGNED: *C. L. W. 1/24/96*
DRAFTED: _____
DATE: *06/90*
APPROVED BY: _____
TITLE: _____
SHEET *3* OF *6* DWS NO. _____
PEHAR



SECTIONAL ELEVATION B-B



SECTIONAL ELEVATION A-A

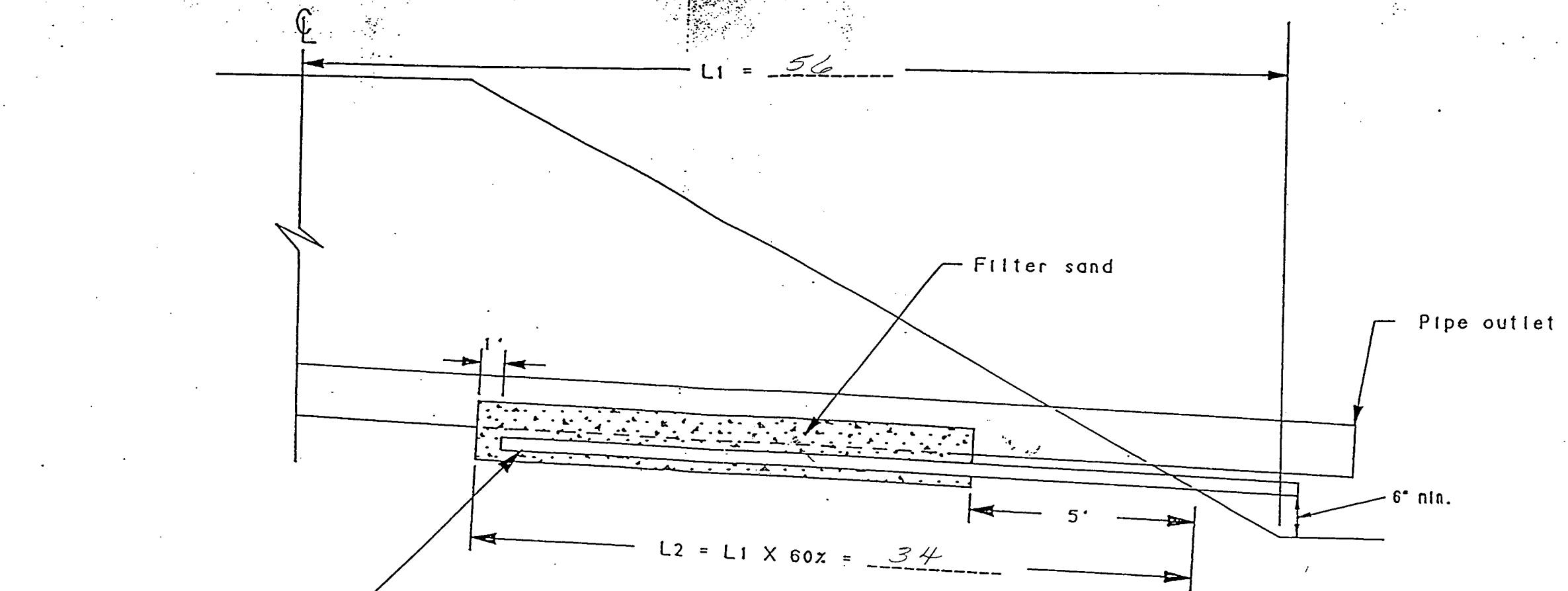
BARREL DIA.	D	R LENGTH FT.-IN.	W LENGTH FT.-IN.	NO. REQ'D	(R) 2" X 6" LENGTH FT.-IN.	NO. REQ'D	ANGLE IRON A & B LENGTH FT.-IN.	FLAT IRON LENGTH FT.-IN.	3/8" DIA. X 3" BOLTS, NUTS & WASHERS	3/8" DIA. X 4" BOLTS, NUTS & WASHERS	ANGLE
10"	0'-9 1/4"	3'-0"	(2" X 107 X 4'-8"	1	3'-0"	1	1'-2 3/4"	2'-1 1/2"	4	8	62°
12"	0'-11 1/4"	3'-0"	(2" X 127 X 5'-0"	1	3'-0"	1	1'-4 3/4"	2'-2 1/2"	4	8	57°
15"	1'-2 3/4"	3'-0"	(2" X 107 X 5'-6" (2" X 67 X 5'-6"	1 1	3'-0"	1	1'-8 1/4"	2'-4 3/4"	8	8	49°
18"	1'-6 1/2"	3'-0"	(2" X 107 X 6'-0"	2	3'-0"	1	2'-0"	2'-7"	8	8	43°
24"	1'-10 1/2"	3'-0"	(2" X 127 X 7'-0"	2	3'-0"	1	2'-4"	2'-10 1/4"	8	8	38°
30"	2'-4"	4'-0" 5'-0"	(2" X 127 X 16'-0" (2" X 67 X 16'-0"	2 1	4'-6" 5'-0"	1	2'-9 1/2"	3'-6 1/2" 3'-10"	12	8	40° 49°
36"	2'-9 3/4"	4'-6"	(2" X 127 X 10'-6"	3	4'-6"	1	3'-3"	4'-3/4"	12	8	38°

ANTIVORTEX BAFFLE FOR
CONCRETE RISER

Born to Bloom

USDA U.S. Department of Agriculture
Natural Resources Conservation Service

DESIGNED: *C.L. Wynn* APPROVED BY: _____
DRAFTED: _____ TITLE: _____
DATE: *06/100* SHEET *4* OF *6* DWG NO. AVBAF-CR-004

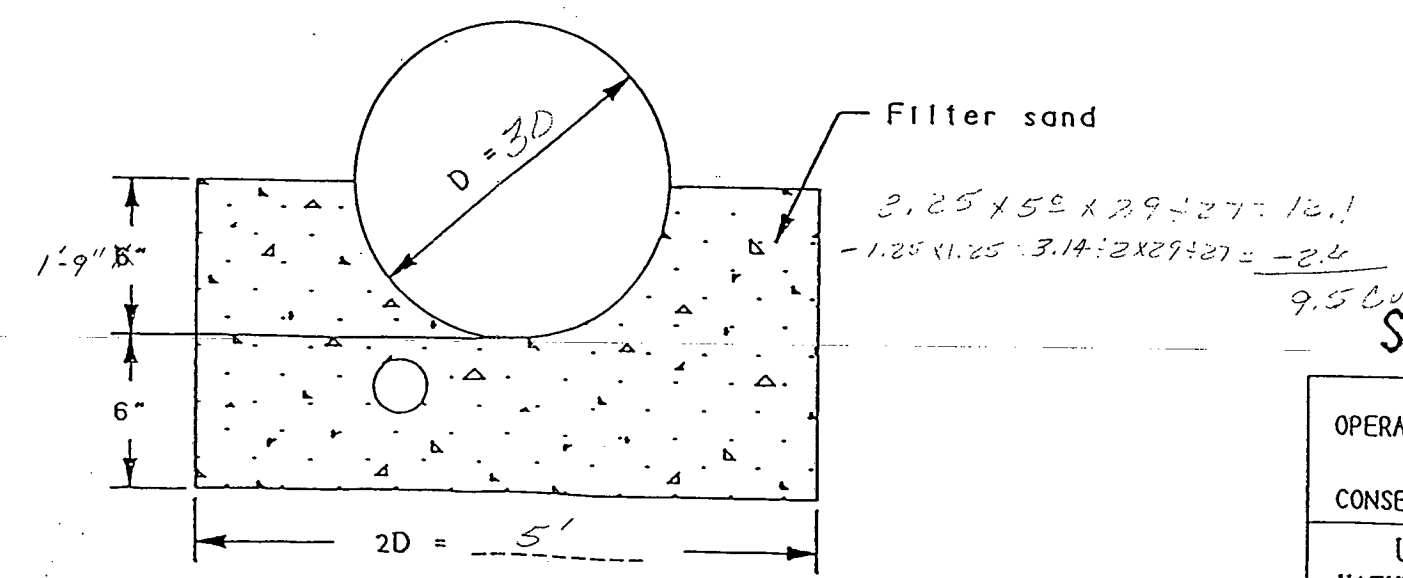


4" dia. perforated pipe
 29'-0" long
 4" dia solid pipe
 11'-0" long

SIDE VIEW

FILTER GRADATION

SIEVE SIZE	PERCENT PASSING
3/8"	100
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10



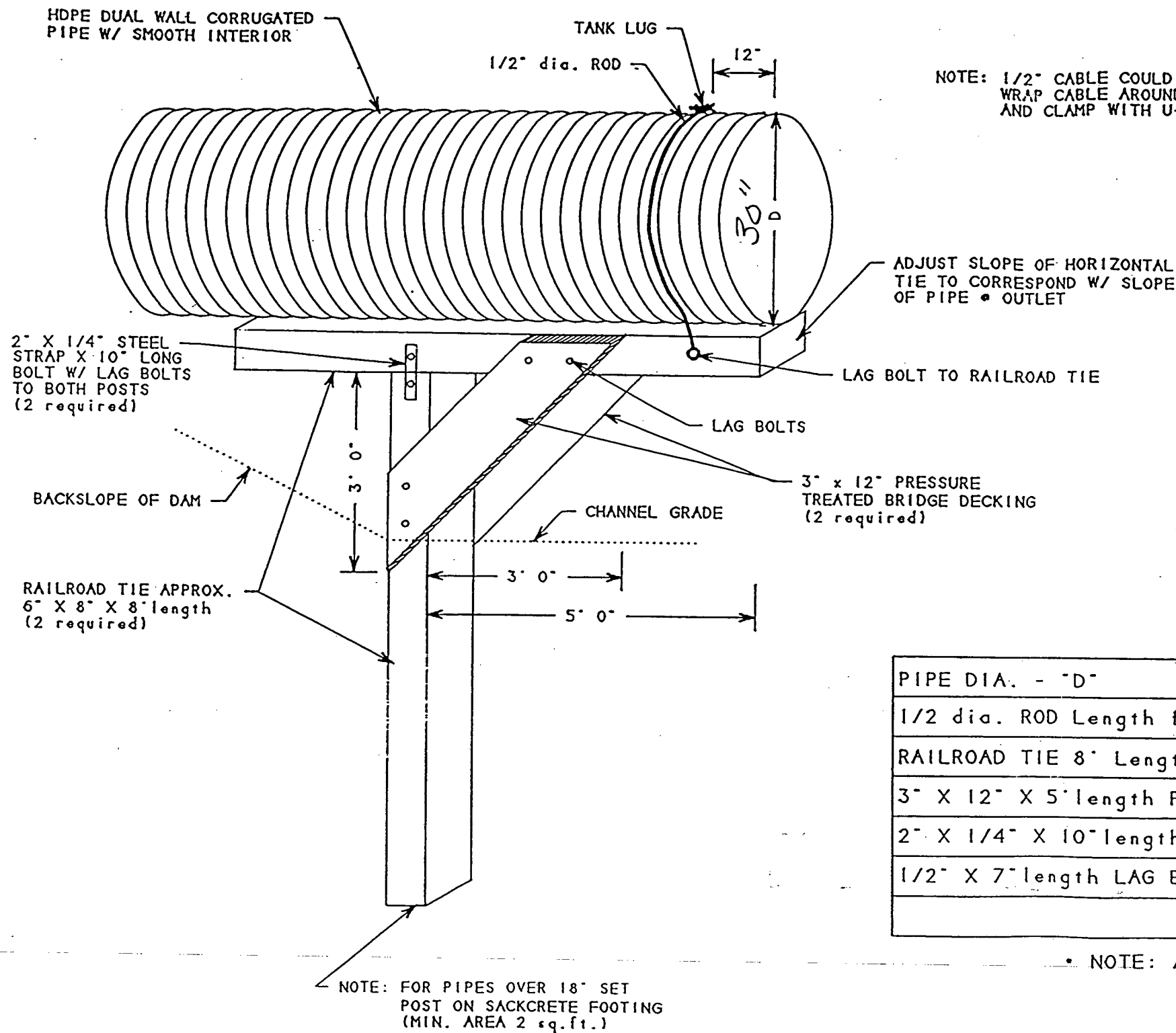
UPSTREAM VIEW

SAND ANTISEEP DRAIN

- NOTE:
1. THE 4" DIA. PIPE SHALL BE SDR 35 PVC, OR STRONGER
 2. PROVIDE AN ANIMAL GUARD ON DRAIN OUTLET PIPE. DRILL 1/2" DIA. HOLES, ON ϕ 6" FROM END OF PIPE AND PLACE A 3/8" DIA., 5 1/2" LONG GALVANIZED STEEL BOLT THRU THEM AND SECURE WITH A NUT (PLACE BOLT HORIZONTAL).
 3. FILTER SAND WILL BE CLEAN PEA AGGREGATE OR CONCRETE SAND.

Rev. 3/96
 JOB PLAN NO. 3.8-P

OPERATOR <u>Bernita Bloom</u>	
CONSERVATION DISTRICT <u>East Penn.</u>	
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	
Designed <u>CLM/ly</u> <u>02/00</u>	Date <u>02/00</u>
Drawn _____	Approved by _____
Traced _____	Title _____
Checked _____	Title _____
Sheet No. <u>5</u>	Org. No. _____
of <u>6</u>	



PIPE DIA. - "D"	10"	12"	15"	18"	24"	30"	36"
1/2 dia. ROD Length ft.-in.	3' 2"	3' 8"	4' 6"	5' 4"	7' 0"	8' 6"	10' 1"
RAILROAD TIE 8' Length	2 ea.						
3" X 12" X 5' length P.T. BRIDGE PLANK	2 ea.						
2" X 1/4" X 10" length STEEL STRAP	2 ea.						
1/2" X 7" length LAG BOLTS W/ WASHERS	14 ea.						

• NOTE: ADD 1' 0" TO LENGTH IF CABLE IS USED

PIPE SUPPORT FOR HDPE PIPE

Bernice Bloom	
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	
DESIGNED: C. L. M. M. M.	APPROVED BY: _____
DRAFTED: _____	TITLE: _____
DATE: 06/00	DWG NO. _____
SHEET 1 of 1	PPE-GLP

DESIGN RUN TO SET
E.S. - USING 5 YR 24 HR TYPE I
STORM & 30" BARREL.
ES CREST SET @ ELEV. 98.0

1*****

SITES XEQ 08/01/2000 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM

VER 96.1 (USER MANUAL - DATED MAY 1996)

TIME 10:35:39

SEE ADDITIONAL TYPE II
RUN FOR DESIGN OF E.S. WIDTH
USING 25 YR & 50 YR STORMS
TO GET RESULTING FLOW DEPTHS

***** 80-80 LIST OF INPUT DATA *****

SITES 03/01/19961

H

* TYPICAL DESIGN RUN - 378 COMPLETE DESIGN W/ CU YD

STRUCTURE

79.9	0.0
87.0	8.52
98.0	60.0
101.0	74.0
107.0	104.0

ENDTABLE

WSDATA	A1	AC 64	2498	3.4		
BASEFLOW		0				
PDIRECT		2.8	3.8	4.4		
POOLDATA	ELEV	96.6	96.6	96.6	79.9	SC
PSINLET		1.0	20			
PSDATA	1	80	30	.009	82	

GRAPHICS IE

CLPROFILE -0.5 DAM CENTERLINE PROFILE

25	104.9	75	102.2	100	101.0
150	83.8	200	81.5	223	79.9
250	80.3	300	82.1	344	91.5
367	92.9	409	97.9	435	99.4
460	100.0	485	101.4	510	102.8
535	104.8				

ENDTABLE

CROWN 0.0

TEMPLATE	12.0	3.0	2.0	0.0		
ASDATA	41 150	100		3		.1
ASINSURF	41		.03	.03		
ASINLET	41	0.0	0.0	100	0.0	3
	200	5				

ENDTABLE

ASEXSURF	41		.03	.03		
		0.5	0.5			
		2	2			
		1	1			
		.02				

ENDTABLE

ASEXIT	41	N	0.0		200	
BTMWIDTH	FEET	75				
GO,DESIGN	EHL	TYPE1	24	TYPE1378	24	96.6

ENDJOB

1SITES XEQ 08/01/2000 ----- COMMENT PAGE -----

VER 96.1

WSID = 1

TYPICAL DESIGN RUN - 378 COMPLETE DESIGN W/ CU YD

***** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
SINCE USER DID NOT INPUT AN ID.

***** MESSAGE - ALTERNATE SUBWATERSHED ID (A) BEING USED SINCE
USER DID NOT INPUT AN ID.

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES -----
XEQ 08/01/2000 WSID= 1
VER 96.1 SUBW= A
TIME 10:35:39 SITE = S 1 PASS= 1 PART= 1

***** BASIC DATA *****
CLIMATE AREA - NOT DEFINED DESIGN CLASS A1 = LT 3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE I RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE I RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY	P-PS,10-DAY	P-SD	P-FB
2.80	.00	3.80	4.40

WSDATA -	CN	DA-SM	TC/L	-/H	QRF
64.00	3.90	3.40	.00	.00	

SITEDATA- PERM POOL	CREST PS	FP SED	VALLEY FL	378?
96.60	96.60	96.60	79.90	YES

BASEFLOW	INITIAL EL	EXTRA VOL	SITE TYPE
.00	.00	.00	DESIGN

PSDATA - NO. COND	COND L	DIA/W	-/H
1.00	80.00	30.00	.00

PS N	KE	WEIR L	TW EL
.009	1.00	20.00	82.00

2ND STG	ORF H	ORF L	START AUX.
.00	.00	.00	96.60

ASCRESTS -	AUX.1	AUX.2	AUX.3	AUX.4	AUX.5
.00	.00	.00	.00	.00	

AUX.DATA - REF.NO.	RETARD. Ci	TIE STATION	INLET LENGTH
41	.00	150.00	100

AUX.DATA - INLET N	SIDE SLOPE	EXIT N	EXIT SLOPE	ACTUAL AUX?
.030	3.00	.030	.100	NO

BTM WIDTH - BW1 BW2 BW3 BW4 BW5
ft 75.00 .00 .00 .00 .00

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES -----
XEQ 08/01/2000 WSID= 1
VER 96.1 SUBW= A
TIME 10:35:39 SITE = S 1 PASS= 1 PART= 2

PERM POOL 96.60 FT 53.4 ACFT .00 AC .0 CFS

CREST PS 96.60 FT 53.4 ACFT .00 AC .0 CFS

SED ACCUM 96.60 FT 53.4 ACFT .00 AC .0 CFS

START ELEV 96.60 FT 53.4 ACFT .00 AC .0 CFS

NRCS-PSH D= 24.00 HR P= 2.80 IN Q= .38 IN DA= 3.90 SM
TC= 3.40 HR CN= 64.00 VOL= 80.0 ACFT

PEAK = 82.2 CFS, AT 14.1 HRS.

ROUTED RESULT - HYD TYPE EMAX VOL-MAX AMAX QMAX
NRCS-PSH 97.78 FT 59.0 ACFT .00 AC 80.6 CFS

PS STORAGE 5.5 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

DRAWDOWN (DDT) TEST 96.60 FT 53.4 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = .96 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	96.60	.00	.00	.00	53.45	.00
2	96.95	12.82	12.82	.00	55.08	.00
3	97.30	36.27	36.27	.00	56.72	.00
4	97.65	66.64	66.64	.00	58.36	.00
5	98.00	102.60	102.60	.00	60.00	.00
FULL CONDUIT FLOW, ELEV = 98.00 FT						
6	99.12	106.20	106.20	.00	65.25	.00
7	100.25	109.63	109.63	.00	70.50	.00
8	101.37	112.96	112.96	.00	75.87	.00

9	102.50	116.19	116.19	.00	81.50	.00
10	103.62	119.34	119.34	.00	87.12	.00
11	104.75	122.41	122.41	.00	92.75	.00
12	105.87	125.40	125.40	.00	98.37	.00
13	107.00	128.32	128.32	.00	104.00	.00

1SITES

XEQ 08/01/2000

WSID= 1

VER 96.1

SUBW= A

TIME 10:35:39

SITE = S 1

PASS= 1 PART= 3

AUX. CREST 97.78 FT 59.0 ACFT .00 AC 80.6 CFS

PS STORAGE 5.5 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

START ELEV 96.60 FT 53.5 ACFT .00 AC .0 CFS

EFFECTIVE HEIGHT(H)= 18.4 FEET, PRODUCT= 1085. (H * STORAGE AT CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-SDH D= 24.00 HR P= 3.80 IN Q= .86 IN DA= 3.90 SM

TC= 3.40 HR CN= 64.00 VOL= 179.5 ACFT

PEAK = 229.9 CFS, AT 12.7 HRS.

NRCS-FBH D= 24.00 HR P= 4.40 IN Q= 1.21 IN DA= 3.90 SM

TC= 3.40 HR CN= 64.00 VOL= 250.9 ACFT

PEAK = 351.0 CFS, AT 12.7 HRS.

***** WARNING - EXIT CHANNEL INTERSECTS VALLEY FLOOR AT STATION 329. BEFORE REACHING LAST POINT OF NATURAL GROUND AT STATION 0.

***** WARNING - CHECK ACCURACY OF ROUTINGS, ELEVATION DIFFERENCE BETWEEN POINTS 10 AND 11 (.07) IS LESS THAN AUXILIARY SPILLWAY INTERNAL RATING DEFINITION INCREMENT (.18).

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	96.60	.00	.00	.00	53.45	.00
2	96.73	2.96	2.96	.00	54.06	.00
3	96.86	8.38	8.38	.00	54.68	.00
4	96.99	15.39	15.39	.00	55.30	.00
5	97.13	23.69	23.69	.00	55.91	.00
6	97.26	33.11	33.11	.00	56.53	.00

7	97.39	43.53	43.53	.00	57.14	.00
8	97.52	54.85	54.85	.00	57.76	.00
9	97.65	67.01	67.01	.00	58.38	.00
10	97.78	79.97	79.97	.00	58.99	.00
11	97.86	90.49	87.30	3.20	59.33	.00
12	97.93	101.24	94.84	6.39	59.66	.00
13	98.00	112.44	102.59	9.85	60.00	.00
FULL CONDUIT FLOW, ELEV = 98.00 FT						
14	98.45	167.06	104.08	62.98	62.10	.00
15	98.90	279.76	105.50	174.26	64.20	.00
16	99.71	570.76	108.00	462.77	67.98	.00
17	100.70	1098.55	110.97	987.57	72.60	.00
18	102.50	2459.78	116.19	2343.58	81.50	.00
19	104.75	4698.46	122.41	4576.06	92.75	.00
20	107.00	7584.07	128.32	7455.76	104.00	.00

SUMMARY OF AUXILIARY SPILLWAY SURFACE CONDITIONS USED IN COMPUTATIONS BY REACH

REACH	FROM STA	TO STA	SLOPE (%)	RETARDANCE CURVE INDEX@	VEGETAL COVER FACTOR	MAINT. CODE	ROOTING DEPTH (ft)	LOCATION
1	50.	150.	.0	.030	**	**	**	CREST
2	150.	329.	10.0	.030	.50	2	1.0	EXIT !

@ The program interprets retardance curve index entries of less than 1 as Manning's n values.

* Upper case indicates a reach of constructed spillway channel.

** The program does not use vegetal cover factor, maintenance code, and rooting depth for inlet and crest reaches in computations.

! Reach 2 used in computing exit channel velocities.

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX FT	AUX.-HP ACFT	VOL-AUX. ACFT
NRCS-SDH	75.0	98.69	63.2	.0	.91	4.2

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 104.9 123.2 228.0

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.43	3.71	.017	.024

AUXILIARY SPILLWAY DURATION FLOW = 14.1 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.3 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .3 FT

EFFECTIVE STRESS FOR STABILITY ANALYSIS OF AUX. EXIT CHANNEL
(Refer to Ag. Handbook 667, Chapt. 3, for allowable stresses.)

Aux. Discharge = 123. cfs; Bottom Width = 75. ft

REACH FROM TO SLOPE MANNING'S VELOCITY STRESS

NO.	STA	STA	%	n	ft/s	lb/ft^2
2	150.	329.	10.00	.030	6.31	.435

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 97.78 FT.

DRAWDOWN (DDT) TEST 96.60 FT 53.4 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = .70 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX ACFT	AUX.-HP FT	VOL-AUX. ACFT
NRCS-FBH	75.0	99.09	65.1	.0	1.31	6.1

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 106.1 242.5 348.6

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc
AUXILIARY SPILLWAY ---	.68	4.62	.015	.020

AUXILIARY SPILLWAY DURATION FLOW = 15.1 HOURS
ATTACK, OE/B = 1.5 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.2 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .4 FT

>>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (464. CFS).

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX ACFT	AUX.-HP FT	VOL-AUX. ACFT
MIN. AUX.	75.0	99.71	68.0	.0	1.93	9.0

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 108.0 463.8 571.8

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc
AUXILIARY SPILLWAY ---	1.04	5.69	.013	.018

>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.
NEW TOP OF DAM ELEVATION = 99.78.

ROUTED	BTM	WIDTH	MAX	ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT		
MINIMUM AUX.	75.0	99.78	68.3	.0	2.00	9.3		

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 108.2 502.9 611.1

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.10	5.83	.013	.017

>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION = 100.09.

ROUTED	BTM	WIDTH	MAX	ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT		
MINIMUM AUX.	75.0	100.09	69.8	.0	2.31	10.8		

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 109.2 664.9 774.1

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.32	6.37	.012	.016

EMBANKMENT QUANTITIES

VOLUME FILL= 8876. CY, MAX. HEIGHT = 20.7 FT
TOP WIDTH = 12.0 FT, TOP LENGTH = 369.4 FT
AREA OF DAM= .60 AC, AREA TO SEED= .38 AC (PROJECTED HORZ. AREA)

1SITES....JOB NO. 1 COMPLETE.

1

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

3 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

1 SUMMARY TABLE 1 SITES VERSION 96.1
----- DATED 03/01/1996

PASS	DIA./	AUX.	CREST	BTM.	MAX.	MAX.	EMB.	INTEGR.*	EXIT*	TYPE
NO.	WIDTH	ELEV	WIDTH	HP	ELEV	VOL.	DIST.	VEL.	HYD	
	(IN/FT)	(FT)	(FT)	(FT)	(CY)	(FT)	(FT/SEC)			
1	30.0	97.8	75.0	2.3	100.1	8876.	0.	8.2	MIN.	AUX.

Page 8

2.3. UCSign RUN - TYPE II storm
E.S. CREST SET @ 98.0

1*****

SITES XEQ 08/01/2000 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM
VER 96.1 (USER MANUAL - DATED MAY 1996)
TIME 10:45:16

***** 80-80 LIST OF INPUT DATA *****

SITES 03/01/19961

H

*

* TYPICAL DESIGN RUN - 378 COMPLETE DESIGN W/ CU YD
STRUCTURE

79.9	0.0
87.0	8.52
98.0	60.0
101.0	74.0
107.0	104.0

ENDTABLE

WSDATA A1 AC 64 2498 3.4

BASEFLOW 0

PDIRECT 2.8 3.8 4.4

POOLDATA ELEV 96.6 96.6 96.6 79.9 SC

PSINLET 1.0 20

PSDATA 1 80 30 .009 82

GRAPHICS IE

CLPROFILE -0.5 DAM CENTERLINE PROFILE

25	104.9	75	102.2	100	101.0
150	83.8	200	81.5	223	79.9
250	80.3	300	82.1	344	91.5
367	92.9	409	97.9	435	99.4
460	100.0	485	101.4	510	102.8
535	104.8				

ENDTABLE

CROWN 0.0

TEMPLATE 12.0 3.0 2.0 0.0

ASDATA 41 150 100 3 .1

ASCREST ELEV 98.0

ASINSURF 41 .03 .03

ASINLET 41 0.0 0.0 100 0.0 3
200 5

ENDTABLE

ASEXSURF 41 .03 .03

0.5 0.5

2 2

1 1

.02

ENDTABLE

ASEXIT 41 N 0.0 200

BTMWIDTH FEET 75

GO,DESIGN EHL TYPE2 24 TYPE2378 24 96.6

ENDJOB

1SITES XEQ 08/01/2000 ----- COMMENT PAGE -----
VER 96.1 WSID = 1

TYPICAL DESIGN RUN - 378 COMPLETE DESIGN W/ CU YD

***** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
SINCE USER DID NOT INPUT AN ID.

***** MESSAGE - ALTERNATE SUBWATERSHED ID (A) BEING USED SINCE
USER DID NOT INPUT AN ID.

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES -----

XEQ 08/01/2000

WSID= 1

VER 96.1

SUBW= A

TIME 10:45:16

SITE = S 1

PASS= 1 PART= 1

***** BASIC DATA *****

CLIMATE AREA - NOT DEFINED DESIGN CLASS A1 = LT 3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE II RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE II RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY	P-PS,10-DAY	P-SD	P-FB
2.80	.00	3.80	4.40

WSDATA - CN	DA-SM	TC/L	-/H	QRF
.64.00	3.90	3.40	.00	.00

SITEDATA- PERM POOL	CREST PS	FP SED	VALLEY FL	378?
96.60	96.60	96.60	79.90	YES

BASEFLOW	INITIAL EL	EXTRA VOL	SITE TYPE
.00	.00	.00	DESIGN

PSDATA - NO. COND	COND L	DIA/W	-/H
1.00	80.00	30.00	.00

PS N	KE	WEIR L	TW EL
.009	1.00	20.00	82.00

2ND STG	ORF H	ORF L	START AUX.
.00	.00	.00	96.60

ASCRESTS - AUX.1	AUX.2	AUX.3	AUX.4	AUX.5
98.00	.00	.00	.00	.00

AUX.DATA - REF.NO.	RETARD. Ci	TIE STATION	INLET LENGTH
41	.00	150.00	100

AUX.DATA - INLET N	SIDE SLOPE	EXIT N	EXIT SLOPE	ACTUAL AUX?
--------------------	------------	--------	------------	-------------

	.030	3.00	.030	.100	NO	
BTM WIDTH -	BW1	BW2	BW3	BW4	BW5	
ft	75.00	.00	.00	.00	.00	

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES -----
 XEQ 08/01/2000 WSID= 1
 VER 96.1 SUBW= A
 TIME 10:45:16 SITE = S 1 PASS= 1 PART= 2

PERM POOL	96.60 FT	53.4 ACFT	.00 AC	.0 CFS
CREST PS	96.60 FT	53.4 ACFT	.00 AC	.0 CFS
SED ACCUM	96.60 FT	53.4 ACFT	.00 AC	.0 CFS
START ELEV	96.60 FT	53.4 ACFT	.00 AC	.0 CFS

RATING TABLE DEVELOPED, SITE = S 1:
 BY PROGRAM FOR PS AND AUX. SPILLWAYS
 AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	96.60	.00	.00	.00	53.45	.00
2	96.95	12.82	12.82	.00	55.08	.00
3	97.30	36.27	36.27	.00	56.72	.00
4	97.65	66.64	66.64	.00	58.36	.00
5	98.00	102.60	102.60	.00	60.00	.00
FULL CONDUIT FLOW, ELEV = 98.00 FT						
6	99.12	106.20	106.20	.00	65.25	.00
7	100.25	109.63	109.63	.00	70.50	.00
8	101.37	112.96	112.96	.00	75.87	.00
9	102.50	116.19	116.19	.00	81.50	.00
10	103.62	119.34	119.34	.00	87.12	.00
11	104.75	122.41	122.41	.00	92.75	.00
12	105.87	125.40	125.40	.00	98.37	.00
13	107.00	128.32	128.32	.00	104.00	.00

***** MESSAGE - CREST OF AUXILIARY SPILLWAY RAISED 0.05 FT ABOVE THE FULL PIPE
 FLOW ELEVATION IN THE NEXT RATING TO AVOID HAVING INTERPOLATION
 PROBLEMS. NEW CREST ELEVATION = 98.05.

1SITES -----
 XEQ 08/01/2000 WSID= 1
 VER 96.1 SUBW= A
 TIME 10:45:16 SITE = S 1 PASS= 1 PART= 3

AUX. CREST 98.05 FT 60.2 ACFT .00 AC 102.8 CFS

PS STORAGE 6.8 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

START ELEV 96.60 FT 53.4 ACFT .00 AC .0 CFS

EFFECTIVE HEIGHT(H)= 18.6 FEET, PRODUCT= 1123. (H * STORAGE AT CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-SDH D= 24.00 HR P= 3.80 IN Q= .86 IN DA= 3.90 SM
TC= 3.40 HR CN= 64.00 VOL= 179.5 ACFT

PEAK = 402.1 CFS, AT 14.4 HRS.

NRCS-FBH D= 24.00 HR P= 4.40 IN Q= 1.21 IN DA= 3.90 SM
TC= 3.40 HR CN= 64.00 VOL= 250.9 ACFT

PEAK = 588.1 CFS, AT 14.4 HRS.

***** WARNING - EXIT CHANNEL INTERSECTS VALLEY FLOOR AT STATION 331. BEFORE
REACHING LAST POINT OF NATURAL GROUND AT STATION 0.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	96.60	.00	.00	.00	53.45	.00
2	96.95	12.82	12.82	.00	55.08	.00
3	97.30	36.27	36.27	.00	56.72	.00
4	97.65	66.64	66.64	.00	58.36	.00
5	98.00	102.60	102.60	.00	60.00	.00
FULL CONDUIT FLOW, ELEV = 98.00 FT						
6	98.01	102.67	102.67	.00	60.02	.00
7	98.01	102.69	102.69	.00	60.05	.00
8	98.02	102.71	102.71	.00	60.08	.00
9	98.02	102.73	102.73	.00	60.11	.00
10	98.03	102.75	102.75	.00	60.14	.00
11	98.04	102.77	102.77	.00	60.17	.00
12	98.04	102.79	102.79	.00	60.20	.00
13	98.05	102.81	102.81	.00	60.23	.00
14	98.50	134.40	104.23	30.17	62.32	.00
15	98.94	216.80	105.64	111.16	64.41	.00
16	99.75	481.97	108.12	373.85	68.17	.00
17	100.73	957.64	111.08	846.56	72.76	.00
18	102.52	2254.96	116.26	2138.70	81.62	.00
19	104.76	4413.87	122.44	4291.43	92.81	.00
20	107.00	7204.95	128.32	7076.64	104.00	.00

SUMMARY OF AUXILIARY SPILLWAY SURFACE CONDITIONS USED IN COMPUTATIONS BY REACH

REACH	FROM STA (ft)	TO STA (ft)	SLOPE (%)	RETARDANCE CURVE INDEX@	VEGETAL COVER FACTOR	MAINT. CODE	ROOTING DEPTH (ft)	LOCATION
1	50.	150.	.0	.030	**	**	**	CREST
2	150.	331.	10.0	.030	.50	2	1.0	EXIT !

@ The program interprets retardance curve index entries of less than 1 as Manning's n values.

* Upper case indicates a reach of constructed spillway channel.

** The program does not use vegetal cover factor, maintenance code, and rooting depth for inlet and crest reaches in computations.

! Reach 2 used in computing exit channel velocities.

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	ACFT	VOL-MAX AC	AREA-MAX FT	ACFT	AUX.-HP	VOL-AUX.
NRCS-SDH	75.0	99.50	67.0	.0	1.45	6.8		2542.

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 107.4 292.2 399.6

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.77	4.91	.015	.020

AUXILIARY SPILLWAY DURATION FLOW = 7.9 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.9 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .4 FT

EFFECTIVE STRESS FOR STABILITY ANALYSIS OF AUX. EXIT CHANNEL
(Refer to Ag. Handbook 667, Chapt. 3, for allowable stresses.)
Aux. Discharge = 292. cfs; Bottom Width = 75. ft

REACH	FROM NO.	TO STA	SLOPE %	MANNING'S n	VELOCITY ft/s	STRESS lb/ft^2
2	150.	331.	10.00	.030	8.86	.729

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 98.00 FT.

DRAWDOWN (DDT) TEST 96.60 FT 53.4 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = .66 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	75.0	99.97	69.2	.0	1.92	9.0

50 yr.

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 108.8 481.0 589.8

CRITICAL CRITICAL CRITICAL 25% OF Q
DEPTH VELOCITY SLOPE-Sc Sc
AUXILIARY FT FT/SEC FT/FT FT/FT
SPILLWAY --- 1.07 5.75 .013 .018

AUXILIARY SPILLWAY DURATION FLOW = 10.0 HOURS
ATTACK, OE/B = 1.7 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 10.8 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .6 FT

>>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.
NEW TOP OF DAM ELEVATION = 100.05.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	75.0	100.05	69.6	.0	2.00	9.3

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 109.0 517.5 626.6

CRITICAL CRITICAL CRITICAL 25% OF Q
DEPTH VELOCITY SLOPE-Sc Sc
AUXILIARY FT FT/SEC FT/FT FT/FT
SPILLWAY --- 1.12 5.89 .013 .017

>>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION = 100.97.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	75.0	100.97	73.9	.0	2.94	13.7

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 111.8 1018.8 1130.6

CRITICAL CRITICAL CRITICAL 25% OF Q
DEPTH VELOCITY SLOPE-Sc Sc
AUXILIARY FT FT/SEC FT/FT FT/FT
SPILLWAY --- 1.75 7.27 .011 .015

EMBANKMENT QUANTITIES

VOLUME FILL= 9800. CY, MAX. HEIGHT = 21.6 FT
 TOP WIDTH = 12.0 FT, TOP LENGTH = 396.7 FT
 AREA OF DAM= .65 AC, AREA TO SEED= .43 AC (PROJECTED HORZ. AREA)

 1SITES.....JOB NO. 1 COMPLETE.

1

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

2 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

SITES.....COMPUTATIONS COMPLETE

1 SUMMARY TABLE 1 SITES VERSION 96.1
 ----- DATED 03/01/1996

WATERSHED ID	RUN DATE	RUN TIME
1	08/01/2000	10:45:16

>>> SITE SUBWS SUBWS DA CURVE TC TOTAL DA TYPE STRUC <<<									
ID	ID	(SQ MI)	NO.	(HRS)	(SQ MI)	DESIGN	CLASS		
S	1	A	3.90	64.	3.40	3.90	378CR	A1	

PASS	DIA./	AUX.CREST	BTM.	MAX.	MAX.	EMB.	INTEGR.*	EXIT*	TYPE
NO.	WIDTH	ELEV	WIDTH	HP	ELEV	VOL.	DIST.	VEL.	HYD
(IN/FT)	(FT)	(FT)	(FT)	(FT)	(CY)	(FT)	(FT/SEC)		

1	30.0	98.1	75.0	2.9	101.0	9800.	0.	10.8	MIN. AUX.
---	------	------	------	-----	-------	-------	----	------	-----------

* INTEGRITY DIST. AND EXIT VEL. ARE BASED ON THE ROUTED HYDROGRAPH
 AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM),
 WHICH IS SET BY MINIMUM DESIGN CRITERIA.

SITES.....SUMMARY TABLE 1 COMPLETED.

NRCS SITES VERSION 96.1 ,03/01/1996
1 FILES

INPUT

C:\trainsites\Bloomtypell30ESROUTING.D2C

OUTPUT - DATED 08/01/2000 10:45:16
C:\trainsites\Bloomtypell30ESROUTING.OUT

GRAPHICS FILES GENERATED

OPTION "L" DATED 08/01/2000 10:45:16
C:\trainsites\Bloomtypell30ESROUTING.DRG

OPTION "P" DATED 08/01/2000 10:45:16
C:\trainsites\Bloomtypell30ESROUTING.DHY

OPTION "E" DATED 08/01/2000 10:45:16
C:\trainsites\Bloomtypell30ESROUTING.DEM

Water Permit Application No. 2445-2
Bloom Family LTD.

Cat. 3 - Low Hazard Dam

Top of Dam Elev. - 101
2nd Spillway Elev. - 98
P. Spillway Elev. - 96.6
Dis. Top Elev. - 80

Ht. = 21 feet

Normal Storage Capacity = 47 Ac.-Ft.
Int. Storage Capacity = 60 Ac.-Ft.
Max. Storage Capacity = 74 Ac.-Ft.

Int. Capacity x Eff. Ht. = $60 \times 18.4 = 1104 < 3000 \therefore 25\text{yr}$
Minimum Spillway Design

From USGS WRI 80-80 "Tech. for Est. Flood Peaks ... in SD"

$$DA = 2498 \text{ A.} = 3.9 \text{ mi.}^2$$

$$\text{Slope} = 50 \text{ ft/mi.}$$

$$SI = 1.76$$

$$\begin{aligned} Q_{25} &= 83.4 A^{.64} S^{.44} SI^{-.72} \\ &= 83.4 (3.9)^{.64} (.50)^{.44} (1.76)^{-.72} \\ &= 83.4 (2.26) (5.55) (.6656) \\ &= \underline{700 \text{ cfs}} \end{aligned}$$

$$\begin{aligned} Q_{50} &= 106 A^{.63} S^{.44} SI^{-.69} \\ &= 106 (3.9)^{.63} (.50)^{.44} (1.76)^{-.69} \\ &= 106 (2.36) (5.81) (.677) \\ &= \underline{985 \text{ cfs}} \end{aligned}$$

Secondary Spillway Flow

$$\begin{aligned} Q &= CLH^{3/2} \quad C = 2.6 \\ &= (2.6)(75)(3)^{1.5} \quad L = 75' \\ &= \underline{1013 \text{ cfs}} \quad H = 3 \text{ ft} \end{aligned}$$

Section 74:02:08:09

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam Max X-Sec. - OK
4. Area Capacity Data - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Specs - Std NRCS - OK
9. EPP - Cat. 3 N/A - OK

NRCS Annual Yield

$$DA = 2498, ISO = 1\frac{1}{2}, CN = 64 \text{ use 70}$$

$$\begin{aligned} 80\% \text{ chance} &= 0.044 \\ 0.044 \times 2498^{1/2} &= \underline{9 \text{ Ac.-Ft}} \end{aligned}$$

$$\begin{aligned} 50\% \text{ chance} &= 0.15 \\ 0.15 \times 2498^{1/2} &= \underline{31 \text{ Ac.-Ft}} \end{aligned}$$

$$\begin{aligned} 10\% \text{ chance} &= 1.0 \\ 1.0 \times 2498^{1/2} &= \underline{208 \text{ Ac.-Ft}} \end{aligned}$$



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

September 21, 2000

Berneta Bloom
Bloom Family LTD Partnership
16501 Indian Creek Rd.
Scenic, SD 57780

Dear Ms. Bloom:

We have reviewed the plans and specifications for your dam project located in the NW 1/4 of Section 22-T2S-R12E, in Pennington County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction may not begin until Water Permit Application No. 2445-2 is approved.

Our review was to determine compliance with the requirements of the Water Management Board Safety of Dams Rules, Chapter 74:02:08. Approval of these plans and specifications does not release you, as owner of the dam, from the responsibility for operating and maintaining the dam in good repair to ensure the safety of the dam.

The Bloom Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 21 feet and a normal storage capacity of 47 acre-feet and a maximum storage capacity of 74 acre-feet.

If you have any questions, please feel free to contact us.

Sincerely,

Gale N. Selken, P.E.
Natural Resources Engineer IV
for Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

c: Steve Quissell, NRCS Rapid City
Gerald Magelky, NRCS Kadoka



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PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.

September 21, 2000

Berneta Bloom
Bloom Family LTD Partnership
16501 Indian Creek Rd
Scenic SD 57780

Dear Ms. Bloom:

Water Permit Application No. 2445-2 for fish & wildlife propagation and livestock watering use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Rapid City Journal printed at Rapid City, SD (Ph # 605 394-8300). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

NOTE : If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

September 21, 2000

Rapid City Journal
PO Box 450
Rapid City SD 57709-0450

ATTENTION: Legal Public Notice

Enclosed is a Notice of Hearing on Application No. 2445-2 to Appropriate Water to be published twice. Please publish the first notice on September 28, 2000 with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Bloom Family LTD Partnership, 16501 Indian Creek Rd, Scenic SD 57780 (Ph # 605 343-0025 or 605 993-6743).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

No. 2445-2

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of September 21, 2000 enclosing Notice of Hearing to Appropriate Water by Application No. 2445-2 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on September 28, 2000 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 2445-2 to Appropriate Water

Notice is given that the Bloom Family LTD. Partnership, 16501 Indian Creek Rd, Scenic SD 57780 has filed an application for a water permit to impound 47 acre-feet of water from runoff by constructing a dam located in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 22 with water impounded in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ Section 22; all in T2S-R12E. This application requests impoundment of sufficient water to maintain water at the outlet elevation. The water is to be used to provide habitat for fish and wildlife propagation and livestock watering purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2445-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 16, 2000.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
 County of Pennington)

I, Patricia K. Van Patten

certify that the attached printed Notice was taken

from the Rapid City Journal

printed and published in Rapid City

County of Pennington and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

September 27, 2000

October 2, 2000

Cost of Printing Eighty-five dollars

and no cents (\$85.00)

Patricia K. Van Patten
 (Signature)

Legal Advertising Representative
 (Title)

October 2, 2000
 (Date Signed)

Sept. 27, Oct. 2 L764883

NOTICE OF APPLICATION NO. 2445-2 TO APPROPRIATE WATER

Notice is given that the Bloom Family Ltd. Partnership, 16501 Indian Creek Rd., Scenic, SD 57780, has filed an application for a water permit to impound 47 acre-feet of water from runoff by constructing a dam located in the SW1/4NW1/4 Section 22 with water impounded in the SW1/4NW1/4 Section 22; all in T2S-R12E. This application requests impoundment of sufficient water to maintain water at the outlet elevation. The water is to be used to provide habitat for fish and wildlife propagation and livestock watering purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2445-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

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The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application.

Steven M. Pirmer, Secretary
 Department of Environment
 and Natural Resources



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

Bloom Family LTD. Partnership
Berneta Bloom
16501 Indian Creek Rd
Scenic SD 57780

Dear Ms. Bloom:

Enclosed is Water Permit No. 2445-2 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed.

Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 2445-2

I have this day, April 5, 2016 made a thorough examination of the water use system constructed by Bloom Family Ltd. Partnership, 17049 Indian Creek Rd, Scenic SD, 57780 of Permit No. 2445-2, bearing the priority of 8/21/2000 authorizing the diversion and storage of 47 acre-feet water of a dry draw tributary of the Cheyenne River for Fish and Wildlife and Domestic purposes, in Pennington County.

Inspection contact & relationship to permit holder, if applicable:

Frank Bloom, managing partner
17049 Indian Creek Rd, Scenic SD, 57780
605-993-3100

A. Dam Information:

- 1) Height to crest 21 feet from downstream toe
- 2) Height to primary spillway 16.6 feet from downstream toe
- 3) Height to secondary spillway 18 feet from downstream toe
- 4) Crest width 12 feet
- 5) Crest length 325 feet
- 6) Primary Spillway diameter 30 inches (102 cfs)
- 7) Secondary Spillway width 75 feet (500 cfs)
- 8) Approx. storage to primary spillway 46.9 ac-ft
- 9) Approx. storage to crest 74 ac-ft
- 10) Drainage Area 2,498 ac.
- 11) Surface Area 4.9 ac.
- Date constructed: 2001

B. Works used to apply water to beneficial use:

The dam is used for livestock water and fish and wildlife.

C. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Yes

Any low flows which must be bypassed as needed for downstream domestic use, livestock and prior water rights purposes will be accomplished using temporary methods (pump or siphon). The plans and specifications as approved did not include provisions for a drawdown structure.

- 2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period N/A

List any extended period of nonuse: **none**

- 3) Exceptions to compliance are: none

D. Condition and Location:

1. The system is in good condition with the point of diversion located as follows:

SW ¼ NW ¼ S22 T2S R12E (south 1,550 ft. and east 669 ft. from NE corner),
N 43.860955° W102.674102° NW

The works are capable of diverting and conveying to the place of use and storing 47 acre-feet of water which is to be used for **fish, wildlife and domestic use**. Water has been put to beneficial use to the maximum extent and the license should be issued for 47 acre-feet of storage.

2. All structures, wells and lands on map Yes

If no, describe: **xx**

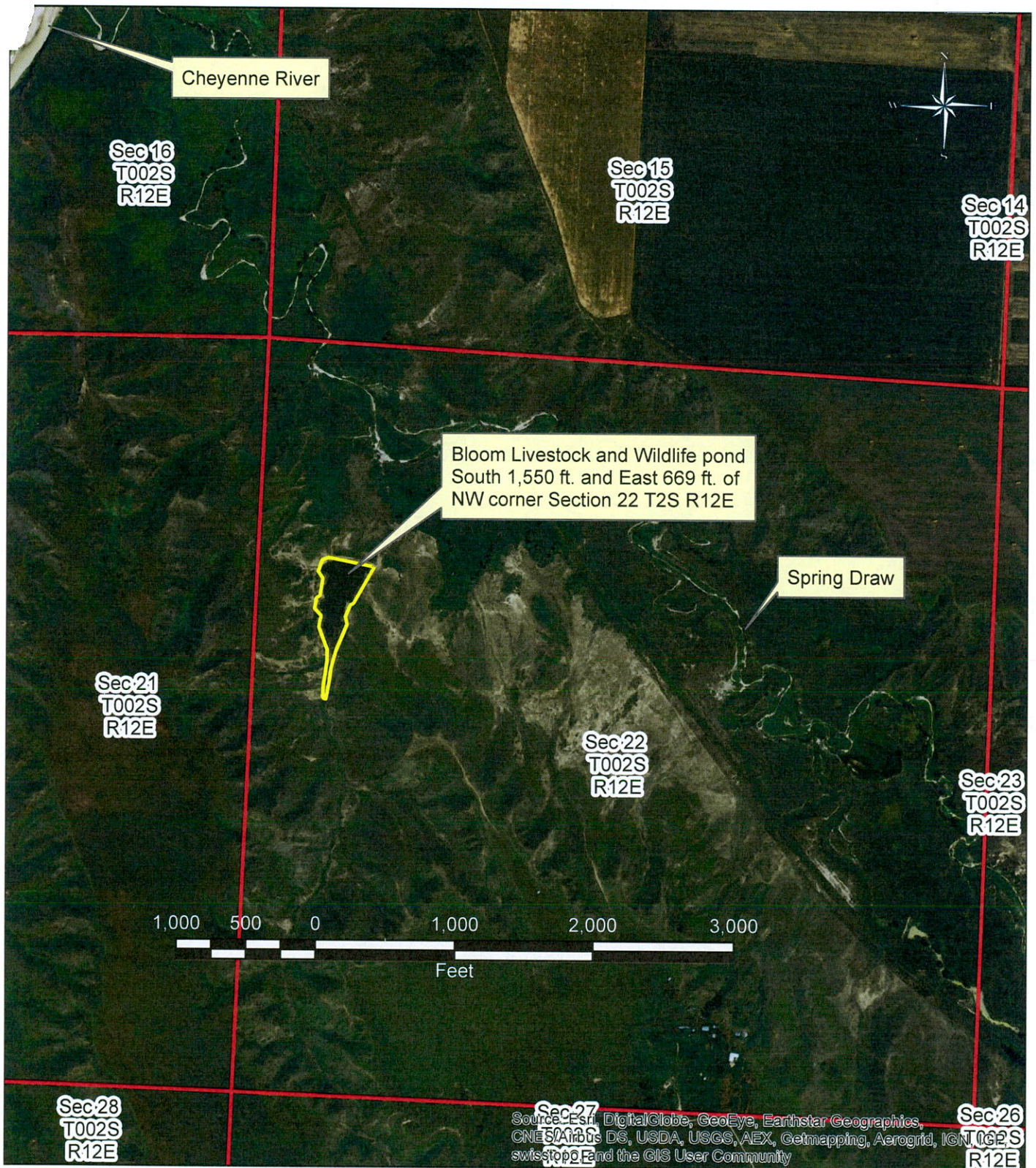
E. Comments or other permit(s) associated with the project: none



Steven Quissell
Water Rights Inspector
DENR, Water Rights Program

Date report completed: 4/6/2016

Water Right #2445-2
Bloom Family Ltd. Partnership
4/5/2016



Steven Quissell

Steven Quissell
Water Rights Inspector
DENR Water Rights Program





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

MAY 02 2016

2445-2

Bloom Family Ltd Partnership
17049 Indian Creek Rd
Scenic SD 57780

Dear Sir:

Enclosed is Water License No. 2445-2. This is the final water right document completing your process of obtaining a Water Right. Also, included with your license is a map prepared by the staff engineer who conducted the investigation.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 2445-2

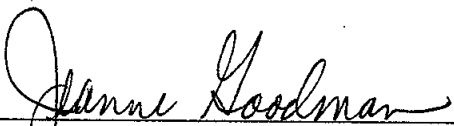
(1) Bloom Family Ltd. Partnership, 17049 Indian Creek Rd, Scenic SD 57780 made Application No. 2445-2, August 21, 2000 for a water permit to impound 47 acre feet of water from runoff, Pennington County, South Dakota for fish and wildlife propagation and livestock watering purposes. Permit No. 2445-2, with a priority date of August 21, 2000 was approved October 16, 2000 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before October 16, 2005 and for the application to beneficial use of water on or before October 16, 2009.

(2) The water supply system has been completed and water applied to beneficial use in accordance with South Dakota State Law. Pursuant to South Dakota Codified Law 46-5-30.1, the holder and/or owner of Water Right No. 2445-2 is issued a license, bearing a priority date of August 21, 2000, to impound 47 acre feet of water from runoff for fish and wildlife propagation and livestock watering purposes.

The location of the storage dam (spillway) is 1,550 feet south and 669 feet east of the NW corner of Section 22-T2S-R12E (SW 1/4 NW 1/4) with water impounded in the same area.

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 2445-2, including the following qualifications:

- Water Permit No. 2445-2 authorizes a dam with a storage capacity of 47 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
- Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.



Jeanne Goodman, Chief Engineer
Water Rights Program

Department of Environment and Natural Resources

MAY 02 2016

date

