AGGREGATES USA, LLC
P.O. Box 15005, Knoxville, TN 37901
865-573-7625 **Fax 865-512-7661**

DEC 28 2016

Via Hand Delivery

December 28, 2016

Bryan Epperson, Manager
Tennessee Department of Environment & Conservation
Division of Water Resources-Surface Mining Section
3711 Middlebrook Pike
Knoxville, TN 37921-6538

Re: Aggregates USA (Elizabethton), LLC Quarry - NPDES TN0068977
Application for NPDES Permit Modification with Revoke & Reissue

Dear Mr. Epperson:

Enclosed please find one (1) original and two (2) copies of the NPDES Permit Modification Application for the Aggregates USA (Elizabethton), LLC Quarry located in Elizabethton, Carter County, Tennessee. With this application Aggregates USA requests that the Division revoke and re-issue the permit for a new five year term.

In this modification application the following changes are proposed to the current approved plans. First the currently permitted overburden storage area located just west of the current product stockpile yard will be increased in size to create a larger finished stone product stockpile capacity. The second purpose is to designate additional areas for overburden placement on the map. The final purpose is to increase in size the designated area on the map for stone extractive activities.

The quarry site was walked with a handheld GPS Unit to check the latitude and longitude locations of the outfall points. As a result, the locations were administratively adjusted on EPA Form 2C but no outfalls have been physically moved on the ground.

Please find Check #034843 in the amount of $1275.00 enclosed for the plans review fee.

If you have any questions concerning this application or correspondence, please contact me at 865-512-7628 or walthillis@aggregatesusa.com.

Sincerely,

Walt Hillis

Walt Hillis
Aggregates USA, LLC

Environmental Manager

Enclosures

FILE COPY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

ENVIRONMENTAL FIELD OFFICE

3711 Middlebrook Pike
Knoxville, TN 37921

(865)594-6035 STATEWIDE 1-888-891-8332 (865)594-6105

Receipt: EAC-K-7438 **Date of Receipt:** 29-Dec-2016 1:34 pm **Created By:** Brittani Dodd (BG57015)

County: Knox **EFO/Office:** Knoxville Field Office

Received From: Walt Hillis

Company/Affiliation: Aggregates USA, LLC

Recipient Address: P.O. Box 15005
KNOXVILLE, TN- 37901

Amount Received: $1,275.00 **Method of Payment:** CHECK **Check Number:** 034843

Comments: NPDES Modification - TN0068977

Division	Description	TDEC Code	Quantity	Unit Price	Line Total
WPC	WPC-MS $25 Non-Coal Mining Acreage Fee	37.000.501	1	$25.00	$25.00
WPC	WPC-MS $1250 Non-Coal Mining Permit Fee	37.*****.G15	1	$1,250.00	$1,250.00

Receipt Total: **$1,275.00**

Visit us at: http://tn.gov/environment/

CN-1139 (Rev. 6-09)

RDA S1730

Aggregates USA, LLC

DEC 2 8 2016

NPDES APPLICATION for MODIFICATION TO EXISTING NPDES PERMIT

for

AGGREGATES USA (Elizabethton), LLC QUARRY
NPDES Permit # TN0068977

Approximate Permitted Acreage: ± 77.1 Acres

Location:
36° 22' 48" N Lat. 82° 11' 01" W Long.
210 Judge Ben Allen Road, Elizabethton, Carter County, Tennessee 37643

Submittal Date:
December 28, 2016

Corporate Officer:

Steven R. Bennett
Tri-Cities Region Area Manager - Aggregates USA, LLC

Application Prepared by:

Ryan Maloney
Professional Engineer
Griggs & Maloney, Incorporated

Walt Hillis
Environmental Manager - Aggregates USA, LLC

DEC 2 8 2016

1	NPDES Permit Application Cover Letter
2	TDEC-Permit Contact Information Form CN-1090
3	EPA Form 1, USGS 8.5x11 Topographic Location Map (Map 1), Water Well Data
4	EPA Form 2C, Site Water Flow Schematic (Drawing A)
5	DMR Copies (3 years)
6	Alternative Analysis
7	Application Narrative
8	Drainage Plan Narrative & Calculations Drawings: Typical Details Berms, E&S Controls, & Drawings B, C, D
9	Site & Property Map (Map 2)
10	Quarry Drainage Plan Map (Map 3)

AVERY® READY INDEX® 600078

AGGREGATES USA, LLC
P.O. Box 15005, Knoxville, TN 37901
865-573-7625 **Fax 865-512-7661**

DEC 2 8 2016

Via Hand Delivery

December 28, 2016

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Tennessee Department of Environment & Conservation
Division of Water Resources-Surface Mining Section
3711 Middlebrook Pike
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Sincerely,

Walt Hillis

Walt Hillis
Aggregates USA, LLC

Environmental Manager

Enclosures

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Water-Based Systems
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243-1102

DEC 2 8 2016

PERMIT CONTACT INFORMATION

Please complete all sections. If one person serves multiple functions, please repeat this information in each section.

PERMIT NUMBER: TN0068977 **DATE:** 11/14/2016

PERMITTED FACILITY: Aggregates USA (Elizabethton), LLC - Quarry **COUNTY:** Carter

OFFICIAL PERMIT CONTACT:

(The permit signatory authority, e.g. responsible corporate officer, principle executive officer or ranking elected official)

Official Contact: Steve Bennett	Title or Position: Area Manager		
Mailing Address: P.O. Box 158	City: Watauga	State: TN	Zip: 37694
Phone number(s): 423-926-0111	E-mail: stevebennett@aggregatesusa.com		

PERMIT BILLING ADDRESS (where invoices should be sent):

Billing Contact: Walt Hillis	Title or Position: Environmental Manager		
Mailing Address: P.O. Box 15005	City: Knoxville	State: TN	Zip: 37901
Phone number(s): 865-573-7625	E-mail: walthillis@aggregatesusa.com		

FACILITY LOCATION (actual location of permit site and local contact for site activity):

Facility Location Contact: Todd Murry	Title or Position: Plant Manager		
Facility Location (physical street address): 210 Judge Ben Allen Road	City: Elizabethton	State: TN	Zip: 37643
Phone number(s): 423-342-4521	E-mail: toddmurray@aggregatesusa.com		

Alternate Contact (if desired): Walt Hillis	Title or Position: Environmental Manager		
Mailing Address: P.O. Box 15005	City: Knoxville	State: TN	Zip: 37901
Phone number(s): 865-512-7628	E-mail: walthillis@aggregatesusa.com		

FACILITY REPORTING (Discharge Monitoring Report (DMR) or other reporting):

Cognizant Official authorized for permit reporting: Walt Hillis	Title or Position: Environmental Manager		
Mailing Address: P.O. Box 15005	City: Knoxville	State: TN	Zip: 37901
Phone number(s): 865-573-7625	E-mail: walthillis@aggregatesusa.com		
Fax number for reporting: 865-512-7661	Does the facility have interest in starting electronic DMR reporting? Yes No Yes		

DEC 2 8 2016

Please print or type in the unshaded areas only.

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F	TN0068977		D
1	2 13	14	15

LABEL ITEMS	
I. EPA I.D. NUMBER	PLEASE PLACE LABEL IN THIS SPACE
III. FACILITY NAME	
V. FACILITY MAILING ADDRESS	
VI. FACILITY LOCATION	

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	Mark "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
	16	17	18		19	20	21
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	X		X	D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
	22	23	24		25	26	27
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
	28	29	30		31	32	33
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
	34	35	36		37	38	39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5)		X	
	40	41	42		43	44	45

III. NAME OF FACILITY

C 1 SKIP AGGREGATES USA (ELIZABETHTON), LLC - QUARRY

15 16 - 29 30 69

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*: C 2 HILLIS WALT ENVIRONMENTAL MANAGER (15 16 45)

B. PHONE *(area code & no.)*: (865) 573-7625 (46 48 49 51 52- 55)

V. FACILTY MAILING ADDRESS

A. STREET OR P.O. BOX: C 3 P.O. BOX 15005 (15 16 45)

B. CITY OR TOWN: C 4 KNOXVILLE (15 16 40)

C. STATE: TN (41 42)

D. ZIP CODE: 37901 (47 51)

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: C 5 210 JUDGE BEN ALLEN ROAD (15 16 45)

B. COUNTY NAME: ARTER (46 70)

C. CITY OR TOWN: C 6 ELIZABETHTON (15 16 40)

D. STATE: TN (41 42)

E. ZIP CODE: 37643 (47 51)

F. COUNTY CODE *(if known)* (52 -54)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 1429 *(specify)* CRUSHED AND BROKEN STONE, NEC (SANDSTONE)	7 1422 *(specify)* CRUSHED AND BROKEN LIMESTONE (DOLOMITIC)
C. THIRD	**D. FOURTH**
7 *(specify)*	7 *(specify)*

VIII. OPERATOR INFORMATION

A. NAME: 8 AGGREGATES USA, LLC

B. Is the name listed in Item VIII-A also the owner? ☑ YES ☐ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box: if "Other," specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P *(specify)*

D. PHONE *(area code & no.)*: A (865) 573-7625

E. STREET OR P.O. BOX: P.O. BOX 15005

F. CITY OR TOWN: B KNOXVILLE

G. STATE: TN

H. ZIP CODE: 37901

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☑ NO

X. EXISTING ENVIRONMENTAL PERMITS

	C	T	I	
A. NPDES *(Discharges to Surface Water)*	9	N		TN0068977
D. PSD *(Air Emissions from Proposed Sources)*	9	P		
B. UIC *(Underground Injection of Fluids)*	9	U		
E. OTHER *(specify)*	9			070331P *(specify)* TDEC-Division of APC, Operating Permit for Rock Crushing & Sizing with wet suppression control
C. RCRA *(Hazardous Wastes)*	9	R		
E. OTHER *(specify)*	9			*(specify)*

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Quarry consisiting of drilling, blasting, excavating, and in-pit truck haulage to processing plant. Crushing, screening, conveying and stockpiling of various product sizes. Manufactured sand plant. Loadout and sales to public, construction companies, and governmental agencies.

Tenants:
None

XIII. CERTIFICATION *(see instructions)*

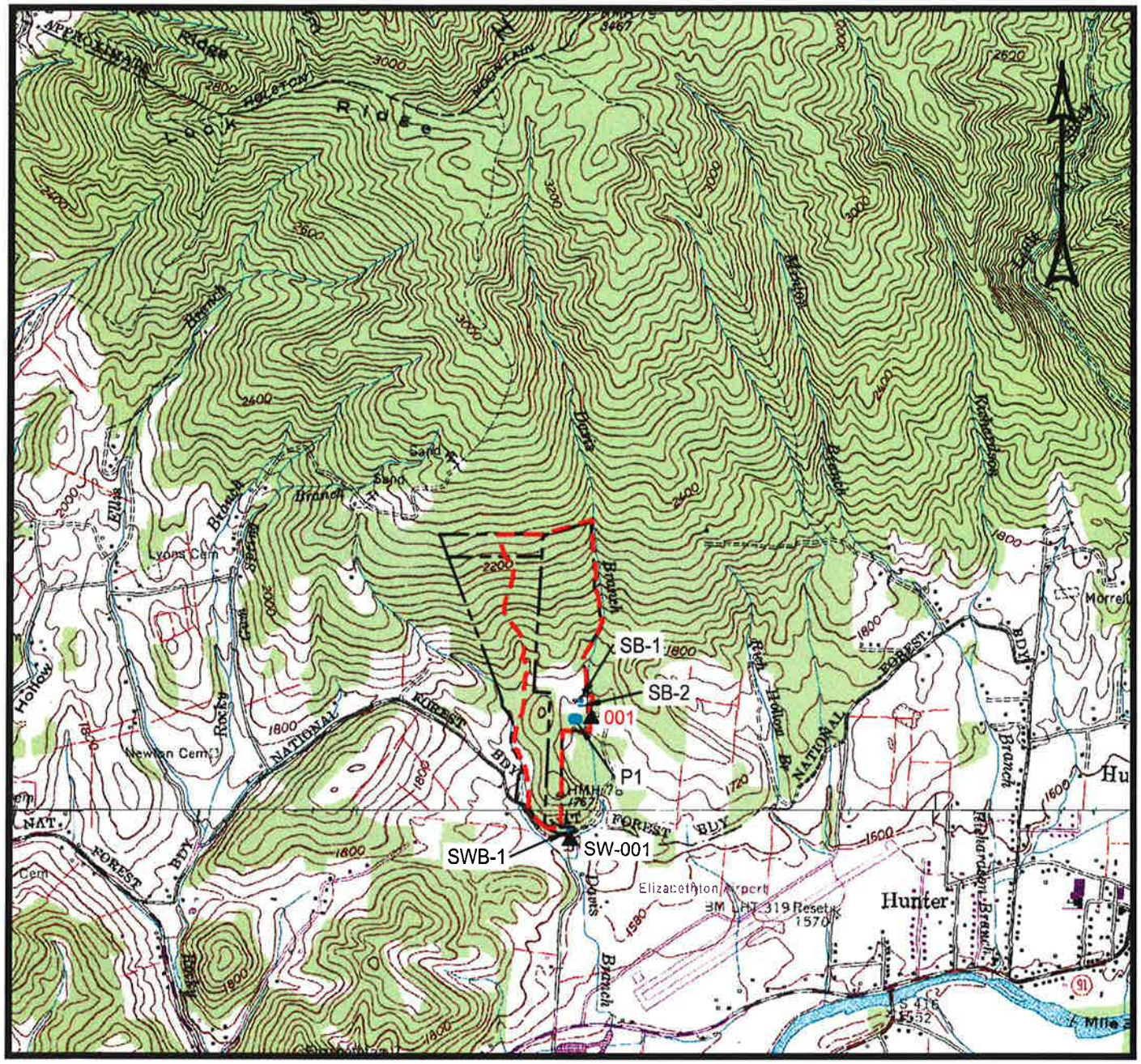
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
Steven R. Bennett, Tri-Cities Region, Area Operations Manager	Steven R Bennett	11/14/16

COMMENTS FOR OFFICIAL USE ONLY

C

DEC 2 8 2016



© 2016 Griggs & Maloney, Inc.

Taken from: U.S.G.S.
7.5 Minute Series (Topographic)
Keenburg / Elizabethton Quadrangles
LAT. 36-22-48N and LONG. 82-11-01W

DISCHARGE MONITORING POINTS (DMPs) ▲

Location Map - Map 1

Aggregates USA (Elizabethton) LLC Quarry
Lat. 36-22-48N and Long. 82-11-01W
Elizabethton, Carter County, Tennessee
Permit Area: +/- 77.1 Acres
Date: 11/7/2016

GRIGGS & MALONEY
INCORPORATED
Engineering & Environmental Consulting
P.O. BOX 2968, MURFREESBORO, TN 37133-2968
(615) 895-8221 * FAX (615) 895-0632

FILE NAME: L: \Enviro\Active\963-13\Permit Modifications\Drawings\Location Map - Map 1.dwg

DEC 2 8 2016

Walt Hillis

From: Robert Hall <Robert.Hall@tn.gov>
Sent: Tuesday, September 20, 2016 9:44 AM
To: Walt Hillis
Subject: RE: Emailing: AggUSA(Elizabethton),LLC Quarry NPDES TN0068977
Attachments: Elizabethton.xls; Keenburg.xls

DEC 2 8 2016

DEC 2 8 2016

Walt,

See attached update reports for the two Quad Maps you requested. Call me if you have any questions.

Robert W. Hall, P.G.
Division of Water Resources
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102
Office: (615) 532-7198
Email: Robert.Hall@tn.gov

-----Original Message-----
From: Walt Hillis [mailto:WaltHillis@aggregatesusa.com]
Sent: Friday, September 16, 2016 12:19 PM
To: Robert Hall
Subject: Emailing: AggUSA(Elizabethton),LLC Quarry NPDES TN0068977

*** This is an EXTERNAL email. Please exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email - STS-Security. ***

Mr. Hall:

I'm now working on an NPDES Permit Modification application for our Elizabethton, TN Quarry. I have attached a copy of the two USGS Maps that the quarry is located on. Can you once again assist me in providing the most current registered water well list for the area around the quarry?

Sincerely,

Walt Hillis
Environmental Manager
Aggregates USA, LLC
P.O. Box 15005
Knoxville, TN 37901
865-255-4349 (cell)
865-512-7628 (office)
865-512-7661 (fax)
walthillis@aggregatesusa.com

Your message is ready to be sent with the following file or link attachments:

DEC 2 8 2016

AggUSA(Elizabethton),LLC Quarry NPDES TN0068977

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

quad_numl	quad_name	quad_nth	well_numbr	owner_name	finish_type	quality	latitude	longitude	county_name	addr_line1	well_use
0207NW	KEENBURG	1	16300223	WASSOM BROS FARM		Good	362848	821239	SULLIVAN		Farm
0207NW	KEENBURG	1	16301352	CRUMLEY, THEODORE	Open Hole	Good	362730	821230	SULLIVAN	MAIN STREET	Residential
0207NW	KEENBURG	1	16301391	MILLER, JIMMY	Open Hole	Good	362730	821230	SULLIVAN	RYDER CHURCH RD	Residential
0207NW	KEENBURG	1	16301392	FARRISS, WALTER	Open Hole	Good	362730	821230	SULLIVAN	WEAVER PIKE	Residential
0207NW	KEENBURG	1	16301399	MILLER, JIMMY	Open Hole	Good	362730	821230	SULLIVAN	HICKORY TREE RD	Residential
0207NW	KEENBURG	1	16301401	DAVIS, CHARLIE	Open Hole		362730	821230	SULLIVAN	TROUBLESOME HOL	Residential
0207NW	KEENBURG	1	16301411	KEENE, MARGARET	Open Hole	Good	362449	821835	SULLIVAN	HUFFMAN RD	Residential
0207NW	KEENBURG	1	20060511	SCALF, GENE	Open Hole	Clear			SULLIVAN		Residential
0207NW	KEENBURG	1	20072608	SAMS, JOHN	Open Hole	Clear			SULLIVAN	548 SIGMON HOLLOW RD	Residential
0207NW	KEENBURG	1	20131835	HARKELROAD, CURTIS	Open Hole	Clear	362756	821435	SULLIVAN	874 DRY BRANCH RD	Farm
0207NW	KEENBURG	1	92000911	REED, DONALD	Open Hole	Good			SULLIVAN	SIGMUN HOLLOW R	Residential
0207NW	KEENBURG	1	93000134	JACKSON, JAMES L	Open Hole				SULLIVAN		Residential
0207NW	KEENBURG	1	93002846	HILLARD, DARRELL	Open Hole				SULLIVAN	PATTY BRANCH RD	Residential
0207NW	KEENBURG	1	99000780	PICKEL, HAROLD	Open Hole				SULLIVAN	SHARPS HOLLOW	Residential
0207NW	KEENBURG	2	16300553	CARRIER J			362844	821119	SULLIVAN		Farm
0207NW	KEENBURG	2	16301343	MOYHER, GEORGE	Open Hole	Good	362730	821000	SULLIVAN	WEAVER CREEK RD	Residential
0207NW	KEENBURG	2	16301400	LADY, DAN	Open Hole		362730	821000	SULLIVAN	HICKORY TREE RD	Residential
0207NW	KEENBURG	2	20023223	GLOVER, HERSCHEL	Open Hole	Clear			SULLIVAN	488 POSSUM CREEK ROAD	Residential
0207NW	KEENBURG	2	20082283	CROSS, JAMES	Open Hole	Clear	362759	821242	SULLIVAN	395 KYTE ROAD	Residential
0207NW	KEENBURG	2	20111453	BAKER, JERRY	Open Hole	Clear	362917	821034	SULLIVAN	RT 44	Residential
0207NW	KEENBURG	2	20150112	MAY, KEVIN	Open Hole	Cloudy	362944	821150	SULLIVAN	344 ROCK LEDGE ROAD	Residential
0207NW	KEENBURG	2	93003929	BROWN, TERESA	Open Hole	Unknown			SULLIVAN		Residential
0207NW	KEENBURG	3	16300206	LOTNER W		Good	362918	820819	SULLIVAN		Residential
0207NW	KEENBURG	3	16300207	BULLINS A		Good	362922	820847	SULLIVAN		Residential
0207NW	KEENBURG	3	16300552	FRITTS G		Good	362745	820910	SULLIVAN		Farm
0207NW	KEENBURG	3	16301330	WELCH, EDWARD	Open Hole		362730	820730	SULLIVAN	HWY 44	Residential
0207NW	KEENBURG	3	16301374	GLOVER, TEDDY	Open Hole	Good	362730	820730	SULLIVAN	HICKORY TREE RD	Residential
0207NW	KEENBURG	3	20013461	CWIRKO, ED	Open Hole	Clear			SULLIVAN	433 RIDDLE CREEK RD	Residential
0207NW	KEENBURG	3	20061251	CARRIER, BARRY	Open Hole	Clear	362916	820618	SULLIVAN	278 RYDER CHURCH RD	Residential
0207NW	KEENBURG	3	20100968	WISE, RANDY	Open Hole	Clear	362758	820958	SULLIVAN	1491 RYDER CHURCH RD	Residential
0207NW	KEENBURG	3	20160525	MILLS , GORDON & BILLIE	Open Hole	Cloudy	362807	821305	SULLIVAN	3959 ROCK HOLD ROAD	Residential
0207NW	KEENBURG	3	93004247	DAVIS, STEVE	Open Hole				SULLIVAN	900 FLATWOODS RD	Residential
0207NW	KEENBURG	3	94001946	ROLLETTE, ROY	Open Hole		362913	820742	SULLIVAN	POTTS HOLLOW 448	Residential
0207NW	KEENBURG	3	99000207	WILLIAMS, DOUG	Open Hole				SULLIVAN		Residential
0207NW	KEENBURG	3	99000602	DAVIS, JOHN	Open Hole				SULLIVAN	RILEY HOLLOW RD	Residential
0207NW	KEENBURG	4	16300534	CUNNINGHAM T		Good	362614	821456	SULLIVAN		Residential
0207NW	KEENBURG	4	16301273	SECARD, RICHARD	Open Hole	Good	362500	821000	SULLIVAN	CHINQUAPIN	Residential
0207NW	KEENBURG	4	20003273	ELLIOT, CHRIS	Open Hole	Dingy			SULLIVAN	BIG ARM BRANCH RD	Residential
0207NW	KEENBURG	4	20032070	CAMPBELL, JERRY	Open Hole	Clear	362517	821345	SULLIVAN	591 BIG ARM ROAD	Residential
0207NW	KEENBURG	4	20060782	BOLING, STEVE	Open Hole	Clear	362521	821303	SULLIVAN	391 BIG ARM BRANCH ROAD	Residential
0207NW	KEENBURG	4	20070811	MALONE, EVELYN	Open Hole	Clear			SULLIVAN	626 BIG ARM BRANCH RD	Residential
0207NW	KEENBURG	4	20083566	WILSON, GLENNA	Open Hole	Clear			SULLIVAN	111 BIG ARM BRANCH ROAD	Residential
0207NW	KEENBURG	4	20121643	COX, DAVID	Open Hole	Clear	362517	821235	SULLIVAN	632 BIG ARM BRANCH RD	Residential

DEC 2 8 2016

quad_numl	quad_name	quad_nth	well_numbr	owner_name	finish_type	quality	latitude	longitude	county_name	addr_line1	well_use
0207NW	KEENBURG	4	93000940	BLACKWELL, RANDY	Open Hole	Good			SULLIVAN		Residential
0207NW	KEENBURG	4	94002797	GLASS, MICHAEL E		Good			CARTER	133	Residential
0207NW	KEENBURG	4	97005208	SHAW, DR VANCE	Open Hole	Unknown			CARTER	PINEY FLATS RD	Residential
0207NW	KEENBURG	4	99005415	HYDER, IVA J	Open Hole				CARTER	1324 RIVER VIEW	Residential
0207NW	KEENBURG	5	16301055	CHINQUAPIN GROVE		Good	362602	821134	SULLIVAN		Municipal
0207NW	KEENBURG	5	16301109	CHINGUAPIN GROVE		Good	362505	821130	SULLIVAN		Municipal
0207NW	KEENBURG	5	20030716	CUNNINGHAM, JOHN	Open Hole	Clear	362638	821033	SULLIVAN	881 MOUNT HOLSTON ROAD	Residential
0207NW	KEENBURG	5	20032610	DINWOODIE, SANDRA	Open Hole	Clear	362710	821203	SULLIVAN	501 JENKINS HOLLOW RD	Residential
0207NW	KEENBURG	5	99001498	BROWN, GEORGE R	Open Hole	Bad			SULLIVAN	549 MILLER HOLO	Residential
0207NW	KEENBURG	5	99003548	*RICE, JOHN					SULLIVAN	JENKINS HOLLOW	Residential
0207NW	KEENBURG	6	20160526	KING , RICHARD	Open Hole	Dingy	362645	821311	SULLIVAN	425 LYONS ROAD	Residential
0207NW	KEENBURG	6	98005464	GRASS, JERRY V	Open Hole				SULLIVAN	TOM HOWARD RD	Residential
0207NW	KEENBURG	7		NO NAME GIVEN			362301	821341	CARTER	1900 OLD ELIZ HIGHWAY	
0207NW	KEENBURG	7	01900415	SAMS, GEORGE	Open Hole		362230	821230	CARTER	19E HWY	Residential
0207NW	KEENBURG	7	01900577	PIERCE, LAURENCE	Open Hole	Good	362230	821230	CARTER	STONEY CREEK	Residential
0207NW	KEENBURG	7	01900578	BUCKLES, MR	Open Hole	Good	362230	821230	CARTER	STONEY CRK RD	Residential
0207NW	KEENBURG	7	20003768	MINTZ, HARRY	Open Hole	Cloudy			CARTER	HIDDEN VALLEY RD	Residential
0207NW	KEENBURG	7	20073026	MINTON, DANNY	Open Hole	Clear			CARTER	1766 OLD ELIZABETHTON HIGH\	Residential
0207NW	KEENBURG	7	20122639	HOLLY, GERALD	Open Hole	Clear	362257	821344	CARTER	1393 BRISTOL HWY	Residential
0207NW	KEENBURG	7	20131212	NORRIS, LARRY	Open Hole	Muddy			CARTER	118 RASNICK HOLLOW RD	Farm
0207NW	KEENBURG	7	92000137	SAVAGE, MICHAEL	Open Hole	Unknown			CARTER		Residential
0207NW	KEENBURG	7	93004104	BUCKLES, IVON	Open Hole				CARTER	BLUE SPRINGS	Residential
0207NW	KEENBURG	7	97002771	GULLION, JOSEPH	Open Hole		362456	821321	SULLIVAN	KEENBURG RD	Residential
0207NW	KEENBURG	7	97004945	REED, EARL	Open Hole				CARTER		Residential
0207NW	KEENBURG	7	99005414	KENNEMORE, STEVE	Open Hole				CARTER	139 KENNEMORE	Residential
0207NW	KEENBURG	8	01900471	BARFIELD, LYNWOOD	Open Hole	Bad	362230	821000	CARTER	SHELLTOWN RD	Other
0207NW	KEENBURG	8	20015211	WHITEHEAD, MICHAEL	Open Hole	Clear			CARTER	GAD CREEK RD	Residential
0207NW	KEENBURG	8	20015212	MAPES PIANO COMPANY	Open Hole	Clear			CARTER	# 1 WIRE MILL RD	Industrial
0207NW	KEENBURG	8	20064326	KARTER, RUTH	Open Hole	Clear	362306	821016	CARTER	152 GUNSMOKE HOLLOW RD.	Residential
0207NW	KEENBURG	8	20100018	CANNON, ERIC	Open Hole	Clear	362255	821008	CARTER	387 AIRPORT ROAD	Residential
0207NW	KEENBURG	8	20120065	BRATTON, GEORGE	Open Hole	Clear	362259	821027	CARTER	AVIATION ROAD	Residential
0207NW	KEENBURG	8	20151955	AGRREGATES USA QUARRY	Open Hole	Clear	362247	821114	CARTER	210 JUDGE BEN ALLEN ROAD	Industrial
0207NW	KEENBURG	8	20160839	HANNAH , DENA	Open Hole	Clear	362308	821013	CARTER	142 TWIN PINE LANE	Residential
0207NW	KEENBURG	8	TN019481	OLIVER, CINDY			362302	821009	CARTER	GUNSMOKEHOLLOW	
0207NW	KEENBURG	9	01900502	WATAGUA IND	Open Hole	Good	362230	820730	CARTER	STONEY CRK RD	Industrial
0207NW	KEENBURG	9	20002885	SHELL, DENNIS	Open Hole	Clear			CARTER	159 GEORGE WILSON RD	Residential
0207NW	KEENBURG	9	20023115	WHITEHEAD, TERRY	Open Hole	Clear	362254	820739	CARTER	7375 PRICE RAD	Residential
0207NW	KEENBURG	9	20064703	WHITEHEAD, MIKE	Open Hole	Clear	362228	820800	CARTER	WILLOW SPRINGS	Residential
0207NW	KEENBURG	9	90000298	TAYLOR, WARREN		Unknown			CARTER	STATE HWY 91 N	Residential
0207NW	KEENBURG	9	93001210	HUGHES, DAVID P	Open Hole	Unknown			CARTER		Residential
0207NW	KEENBURG	9	95000303	KARTER, RUTH A		Good			CARTER	19E	Residential
0207NW	KEENBURG	9	95004524	HARDIN, JOHN	Open Hole				CARTER		Residential
0207NW	KEENBURG	9	97004946	HODGE, LARRY	Open Hole				CARTER		Residential

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quad_numbr	quad_name	quad_nth	well_numbr	owner_name	finish_type	quality	latitude	longitude	county_na	addr_line1	well_use
0207SW	ELIZABETHTON	1	01900382	COLBAUGH, HERMAN	Open Hole		362000	821230	CARTER		Residential
0207SW	ELIZABETHTON	1	01900572	ALLEN, BILL	Open Hole	Good	362000	821230	CARTER	SIAM RD	Residential
0207SW	ELIZABETHTON	1	20022164	WILLIAMS, DON RAY	Open Hole	Clear			CARTER	GUNSMOKE HOLLOW RD	Residential
0207SW	ELIZABETHTON	1	20040522	WAL-MART STORES INC	Open Hole		362050	821439	CARTER	1001 WEST ELK AVENUE	Industrial
0207SW	ELIZABETHTON	1	20040523	WAL-MART STORES INC	Open Hole		362057	821433	CARTER	1001 WEST ELK AVENUE	Industrial
0207SW	ELIZABETHTON	1	20042211	LOWES	Open Hole		362052	821431	CARTER	1002 WEST ELK AVENUE	Industrial
0207SW	ELIZABETHTON	1	20043261	CLARK, CHAD	Open Hole	Clear	362146	821240	CARTER	OLD STONEY LOOP	Residential
0207SW	ELIZABETHTON	1	20072096	OWENS, MIKE	Open Hole	Clear			CARTER	305 AVIATION DRIVE	Residential
0207SW	ELIZABETHTON	1	20160954	WILD , DAVID	Open Hole	Clear	362050	821443	CARTER	1005 OVER MOUNTAIN DR	Irrigation
0207SW	ELIZABETHTON	1	90002161	SMITH, LARRY	Open Hole	Good			CARTER	SCYMOORE DRIVE	Residential
0207SW	ELIZABETHTON	1	92000842	SPITZER, JOE	Open Hole				CARTER	STONEY CREEK	Residential
0207SW	ELIZABETHTON	1	93000057	WOODS, HARRY					CARTER	REYNOLDS RD	Farm
0207SW	ELIZABETHTON	1	93003076	FANNON, LARRY	Open Hole				CARTER	BRISTOL 4 LANE	Residential
0207SW	ELIZABETHTON	1	93005122	FARMS, CRUMLEY	Open Hole				CARTER	CYCEMORE SHOLES	Farm
0207SW	ELIZABETHTON	1	94000071	ENSON, RUBY	Open Hole				CARTER	HURLEY HALLEY R	Residential
0207SW	ELIZABETHTON	1	96002533	HART, DENNIS	Open Hole				CARTER	OLD SYCAMORE SH	Residential
0207SW	ELIZABETHTON	1	TN025996	GOLBAUGH, KAREN			362145	821308	CARTER		
0207SW	ELIZABETHTON	2	01900307	WAUTAUGA INDUSTRIES		Good	362139	821113	CARTER	IODENT WAY	Industrial
0207SW	ELIZABETHTON	2	01900314	WAUTAUGA INDUSTRIES	Open Hole	Good	362137	821111	CARTER	IODENT	Industrial
0207SW	ELIZABETHTON	2	01900331	JESUS FAITH CEN	Open Hole	Good	362130	821212	CARTER	OLD STONEY CREE	Other
0207SW	ELIZABETHTON	2	01900383	CARR, RON	Open Hole		362000	821000	CARTER		Residential
0207SW	ELIZABETHTON	2	01900526	TAYLOR, SKIP	Open Hole	Good	362000	821000	CARTER	ELIZ HWY	Residential
0207SW	ELIZABETHTON	2	01900531	BAILEY, PAUL	Open Hole		362000	821000	CARTER	STEWART	Residential
0207SW	ELIZABETHTON	2	01900585	EDWARDS, JESSE E	Open Hole	Good	362000	821000	CARTER		Residential
0207SW	ELIZABETHTON	2	01900614	NASH, GLENN	Open Hole		362000	821000	CARTER	CLAY ROCK RD	Residential
0207SW	ELIZABETHTON	2	20012198	HUTCHINS, RANDALL	Open Hole	Clear			CARTER	414 BROAD ST	Commercial
0207SW	ELIZABETHTON	2	20082739	CITY OF ELIZABETHTON	Open Hole	Dingy	362115	821110	CARTER	1332 BROAD STREET	Municipal
0207SW	ELIZABETHTON	2	20090796	CITY OF ELIZABETHTON	Open Hole	Clear			CARTER	1332 BROAD STREET	Municipal
0207SW	ELIZABETHTON	2	20111879	TN TECH CENTER			362154	821042	CARTER	426 HWY 91	Test
0207SW	ELIZABETHTON	2	90001673	NARC					CARTER		Other
0207SW	ELIZABETHTON	2	90001674	SNAP-ON TOOLS					CARTER		Other
0207SW	ELIZABETHTON	2	91002758	CANNON, J O	Open Hole	Good			CARTER		Residential
0207SW	ELIZABETHTON	2	91002759	RAY, KEITH E	Open Hole	Good			CARTER		Residential
0207SW	ELIZABETHTON	2	93004447	CULBERT, KEN		Good			CARTER	SMALLING (OFF)	Residential
0207SW	ELIZABETHTON	2	95005018	WILLIAMS, LISA	Open Hole	Unknown			CARTER		Residential
0207SW	ELIZABETHTON	2	96005030	GENTRY, BILL	Open Hole	Unknown	362148	821109	CARTER	STONY CREEK	Other
0207SW	ELIZABETHTON	2	96005031	PIERCE, SHERILL	Open Hole	Unknown	362149	821125	CARTER	STONY CREEK	Other
0207SW	ELIZABETHTON	3	01900570	FRAZIER, WESLEY	Open Hole	Good	362000	820730	CARTER	L N HILL	Residential
0207SW	ELIZABETHTON	3	01900575	MURRY, JINNY	Open Hole	Good	362230	820500	CARTER	BUCKLES	Residential

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0207SW	ELIZABETHTON 3	01900576	YOUNGER, GARRY	Open Hole	Good	362000	820730	CARTER	STONEY CREEK RD	Residential
0207SW	ELIZABETHTON 3	20073027	WHITEHEAD, MIKE	Open Hole	Cloudy	362228	820800	CARTER	WILLOW SPRINGS	Residential
0207SW	ELIZABETHTON 3	20084028	WHITEHEAD, MIKE	Open Hole	Clear	362222	820828	CARTER	HUNTER RIDGE LANE	Residential
0207SW	ELIZABETHTON 3	20151545	NEWTON, BRIAN	Open Hole	Cloudy			CARTER	371 BISHOP HOLLOW ROAD	Residential
0207SW	ELIZABETHTON 3	92000835	MARKLIN, CLARENCE	Open Hole				CARTER	BISHOP RD	Residential
0207SW	ELIZABETHTON 3	97001963	SIAM UTILITY DEPT	Open Hole		362025	820852	CARTER	SIAM RD 2483	Municipal
0207SW	ELIZABETHTON 3	97004944	LEWIS, HUBERT	Open Hole				CARTER	748 HWY 91	Commercial
0207SW	ELIZABETHTON 3	98000670	SIAM UTILITY DISTRIC	Open Hole		362032	820748	CARTER	109 WILL ESTET	Commercial
0207SW	ELIZABETHTON 4	01900227	JONES T		Good			CARTER	RT. 5	Residential
0207SW	ELIZABETHTON 4	20023210	CITY OF ELIZABETHTON			361859	821433	CARTER	122 JOURNEY END	Municipal
0207SW	ELIZABETHTON 4	20050481	KYKER, EDDIE	Open Hole	Clear	361939	821351	CARTER	SNEED HILL	Residential
0207SW	ELIZABETHTON 4	20091141	TEAGUE, MICHAEL	Open Hole	Clear	361902	821410	CARTER	581 PINEY GROVE ROAD	Residential
0207SW	ELIZABETHTON 4	20111771	CHURCH, MARTY	Open Hole	Cloudy			CARTER	398 JIM ELLIOTT ROAD	Residential
0207SW	ELIZABETHTON 4	95000064	ELIZABETHTON, CITY OF			361900	821432	CARTER	GAP CREEK	Test
0207SW	ELIZABETHTON 4	95000065	ELIZABETHTON, CITY OF	Open Hole	Good	361754	821401	CARTER	GAP CREEK HWY 3	Test
0207SW	ELIZABETHTON 4	95000066	ELIZABETHTON, CITY OF	Open Hole	Good	361849	821425	CARTER	GAP CREEK	Test
0207SW	ELIZABETHTON 4	95000067	ELIZABETHTON, CITY OF	Open Hole	Good	361803	821408	CARTER	GAP CREEK HWY 3	Test
0207SW	ELIZABETHTON 4	95000069	ELIZABETHTON, CITY	Open Hole	Good	361846	821422	CARTER	GAP CREEK	Test
0207SW	ELIZABETHTON 4	95004433	CITY OF ELIZABETHTON	Open Hole	Good	361902	821433	CARTER	BIG SPRING	Test
0207SW	ELIZABETHTON 4	95005032	CITY OF ELIZABETHTON	Open Hole		361859	821432	CARTER	BIG SPRING	Test
0207SW	ELIZABETHTON 4	95005034	CITY OF ELIZABETHTON	Open Hole		361858	821423	CARTER	GAP CREEK	Test
0207SW	ELIZABETHTON 4	TN019427	DAWN OF HOPE			361900	821449	CARTER		
0207SW	ELIZABETHTON 5	01900553	ROBERTSON	Open Hole	Good	361730	821000	CARTER	HWY 19 E	Residential
0207SW	ELIZABETHTON 5	01900615	LEWIS, STEVE	Open Hole		361730	821000	CARTER	67	Residential
0207SW	ELIZABETHTON 5	20023661	ALCOA			361947	821216	CARTER	1999 STATELINE ROAD	
0207SW	ELIZABETHTON 5	20052159	BARNETT, TIMOTHY	Open Hole	Clear			CARTER	152 PANLICO ROAD	Residential
0207SW	ELIZABETHTON 5	20080913	MARTY - CRITZ, MONIQUE			361730	821000	CARTER	222 CLAY LITTLE RD	
0207SW	ELIZABETHTON 5	20110622	SHAW, GLENN	Open Hole	Clear			CARTER	BRIARCLIFF ROAD	Residential
0207SW	ELIZABETHTON 5	20130717	WILLIS, MATT	Open Hole	Clear	361854	821314	CARTER	BABB	Residential
0207SW	ELIZABETHTON 5	20150044	VINES, HARRY	Open Hole	Clear	361820	821148	CARTER	105 LONG HOLLOW ROAD	Residential
0207SW	ELIZABETHTON 5	91000261	EXTRUSION, JOEL	Open Hole				CARTER	STATE LINE RD	Industrial
0207SW	ELIZABETHTON 5	93003084	CAMBELL, STEVEN	Open Hole				CARTER	GAP CREEK ST	Residential
0207SW	ELIZABETHTON 5	95005033	SIAM UTILITY DIST	Open Hole				CARTER	SIAM	Test
0207SW	ELIZABETHTON 5	96005285	KING, TED	Open Hole				CARTER	RITTERTOWN RD	Residential
0207SW	ELIZABETHTON 7	01900464	JULIAN, HURSHEL	Open Hole		361500	821230	CARTER	HWY 19E	Residential
0207SW	ELIZABETHTON 7	01900545	MILLER, CATHY	Open Hole	Good	361500	821230	CARTER	SIMERLY CREEK	Residential
0207SW	ELIZABETHTON 7	01900560	SIMERLY, VIRGINIA	Open Hole	Good	361500	821230	CARTER	SIMERLY CREEK	Residential
0207SW	ELIZABETHTON 7	20054469	MALONE, MIKE	Open Hole	Clear			CARTER	205 TOLLEY TOWN RD	Residential
0207SW	ELIZABETHTON 7	20060780	PRAYING MOUNTAIN MEN	Open Hole	Clear	361501	821424	CARTER	1940 GAP CREEK RD	Residential
0207SW	ELIZABETHTON 7	20102319	STATE OF TENNESSEE					CARTER	2403 GAP CREEK RD	Municipal

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0207SW	ELIZABETHTON 7	20110697	STREET, JEREMY	Open Hole	Clear	361502	821420	CARTER	162 FIRE STATION ROAD	Residential
0207SW	ELIZABETHTON 7	20140739	ROHMANN, HERB	Open Hole	Cloudy			CARTER	148 LOVELESS ROAD	Residential
0207SW	ELIZABETHTON 7	20140903	ROHMANN, HERB	Open Hole	Cloudy			CARTER	148 LOVELESS RD	Residential
0207SW	ELIZABETHTON 7	20142081	FREEMAN, JOHN	Open Hole	Clear	361510	821401	CARTER	165 GUM HOLLOW RD	Residential
0207SW	ELIZABETHTON 7	94003681	LEWIS, SHANE	Open Hole				CARTER	SIMILER CREEK R	Residential
0207SW	ELIZABETHTON 7	95000068	BOWERS, DAVID	Slotted	Good	361505	821413	CARTER	CULLEN RD	Residential
0207SW	ELIZABETHTON 7	95000379	BOWERS, DAVID	Open Hole	Good			CARTER	CULLER RD	Residential
0207SW	ELIZABETHTON 7	97004673	WEST, BECKY	Open Hole		361723	821427	CARTER	CHEVY LANE 715	Residential
0207SW	ELIZABETHTON 8	01900517	HOLTSCLAW, BULA	Open Hole	Good	361500	821000	CARTER	TIGER CREEK	Residential
0207SW	ELIZABETHTON 8	01900518	CARROL, JOHN	Open Hole	Good	361130	821100	CARTER	TIGER CREEK	Residential
0207SW	ELIZABETHTON 8	01900519	BLEVINS, RICHARD	Open Hole	Good	361135	821110	CARTER	TIGER CREEK	Residential
0207SW	ELIZABETHTON 8	01900520	BLEVINS, PAUL	Open Hole	Good	361130	821105	CARTER	TIGER CREEK	Residential
0207SW	ELIZABETHTON 8	20022656	JAYNES, MATTHEW	Open Hole	Clear			CARTER	123 RHODODENDRON DR	Residential
0207SW	ELIZABETHTON 8	20054464	CAMPBELL, DALE	Open Hole	Clear			CARTER	HWY 19 EAST	Residential
0207SW	ELIZABETHTON 8	20110057	SHAW, GLEN	Open Hole	Clear	361942	824454	CARTER	1812 BRIARCLIFF	Residential
0207SW	ELIZABETHTON 8	20140737	MOFFETT, BARBARA	Open Hole	Cloudy	361602	821056	CARTER	114 & 116 MARLOWE RD	Residential
0207SW	ELIZABETHTON 8	92003649	DOUT, SAM	Open Hole	Unknown			CARTER	INGRAM BRANCH	Residential
0207SW	ELIZABETHTON 8	93000349	ODOM, FRANCES	Open Hole				CARTER	SEMERLEY CREEK	Residential
0207SW	ELIZABETHTON 8	93001113	BLEVINS, JERRY	Open Hole	Unknown			CARTER	HWY 19E	Residential
0207SW	ELIZABETHTON 8	93004633	POWERS, JIM	Open Hole		361705	821112	CARTER	WIND SONG MT RD	Residential
0207SW	ELIZABETHTON 8	95003101	MORGAN, CHAD	Open Hole	Unknown			CARTER	INGRAM BR	Residential
0207SW	ELIZABETHTON 8	96001792	CABLE, JAMES	Open Hole	Good			CARTER	JENKINS HOLLOW	Residential
0207SW	ELIZABETHTON 8	96002531	JOHNSON, BEN	Open Hole				CARTER	WIND SONG MT RD	Residential
0207SW	ELIZABETHTON 8	99001737	NEELEY, CHARLES	Open Hole	Good			CARTER	INGRAM BRANCH R	Residential
0207SW	ELIZABETHTON 9	01900372	WOODLEY, WILLIAM	Open Hole	Good	361500	820730	CARTER		Residential
0207SW	ELIZABETHTON 9	01900584	TOWNSEND, R J	Open Hole	Good	361500	820730	CARTER	HWY 19 E	Residential
0207SW	ELIZABETHTON 9	01900590	GOAGE, LORETTA	Open Hole	Good	361500	820730	CARTER	HWY 19E	Residential
0207SW	ELIZABETHTON 9	20002151	LYONS, GARY	Open Hole	Dingy			CARTER		Residential
0207SW	ELIZABETHTON 9	20021795	BANKS, TOM	Open Hole	Clear			CARTER	DENNIS COVE RD	Residential
0207SW	ELIZABETHTON 9	20021838	PEREGOY, DOUGLAS L		Clear			CARTER	HWY 321	Residential
0207SW	ELIZABETHTON 9	20052996	FORTNER, IKE	Open Hole	Clear	361552	820754	CARTER	1233 DENNIS COVE ROAD	Residential
0207SW	ELIZABETHTON 9	20063258	PROFFITT, DELLA SUE	Open Hole	Clear			CARTER	1442 DENNIS COVE ROAD	Residential
0207SW	ELIZABETHTON 9	91000602	RANGE, JOHNNY		Good			CARTER	PRICE ST	Residential
0207SW	ELIZABETHTON 9	91001619	BLEVINS, JUNIOR	Open Hole	Unknown			CARTER	FORK MTN RD	Residential
0207SW	ELIZABETHTON 9	92003015	BLANCHARD, JOHN	Open Hole	Unknown			CARTER	FORK MTN	Residential
0207SW	ELIZABETHTON 9	93000067	JOHNSON, DAVID	Open Hole	Unknown			CARTER	WHITE HEAD HL H	Residential
0207SW	ELIZABETHTON 9	94002453	LARGENT, STANLEY	Open Hole				CARTER		
0207SW	ELIZABETHTON 9	94002455	LYONS, TOMMY	Open Hole	Unknown			CARTER	WHITE HEZD HILL	Residential
0207SW	ELIZABETHTON 9	95001641	TIPTON, WARREN	Open Hole	Unknown			CARTER	HWY 19E	Residential
0207SW	ELIZABETHTON 9	96000091	WHITEHEAD, CLARENCE		Good			CARTER	DENNIS COVE RD	Residential
0207SW	ELIZABETHTON 9	96001886	PEOPLES, ROBERT	Open Hole				CARTER	1278 DENNIS COV	Residential
0207SW	ELIZABETHTON 9	97002152	DAVIS, HURLEY	Open Hole	Unknown			CARTER	19 E HWY	Residential
0207SW	ELIZABETHTON 9	97005103	TOWNSEND, JAKE	Open Hole	Unknown			CARTER	HWY 19E WHITHEA	Residential
0207SW	ELIZABETHTON 9	99001500	FROSLEY, DOUG	Open Hole		361630	820930	CARTER	189 DENNIS COVE ROAD	Residential

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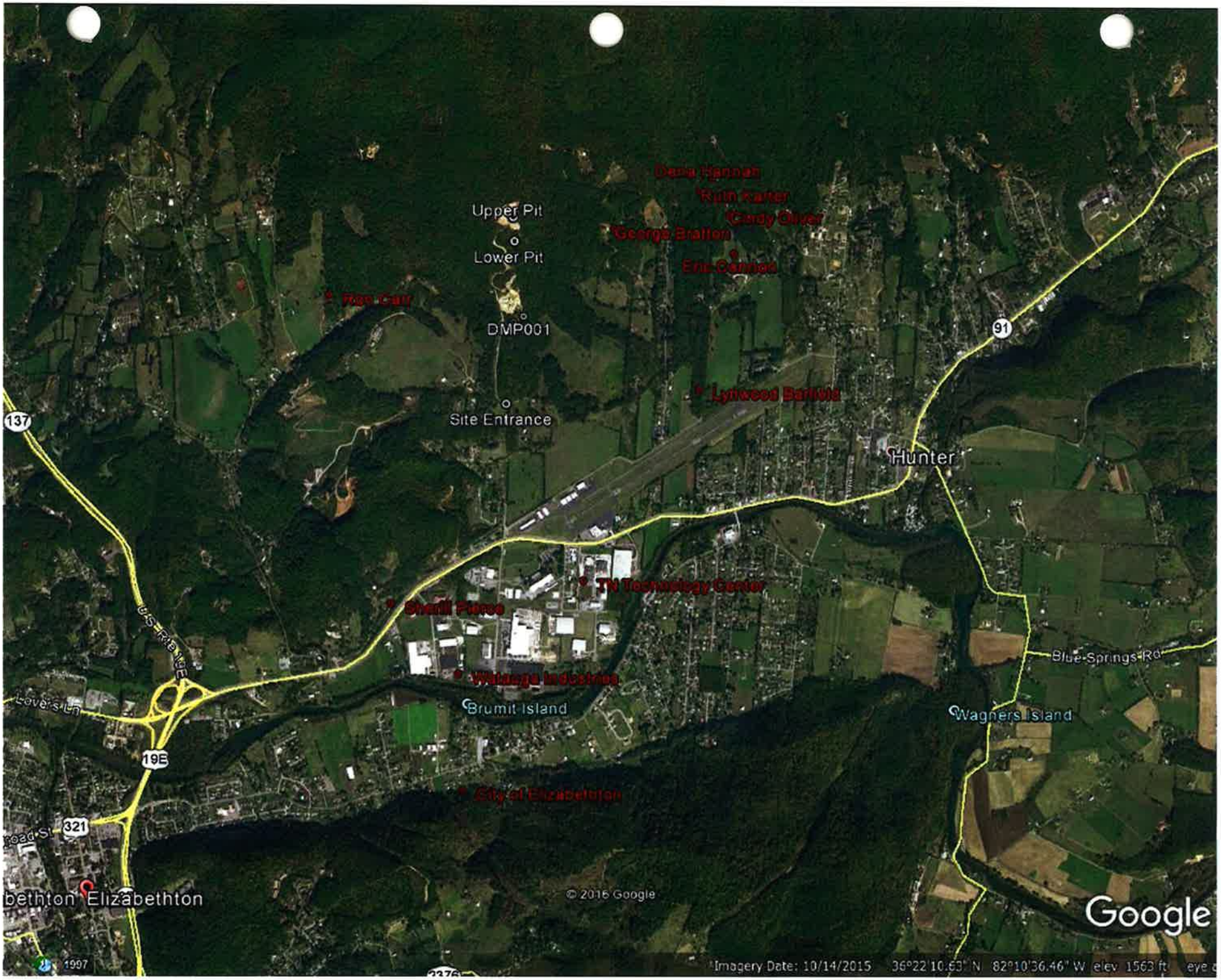
Dana Hannah
Ruth Karter
Cindy Oliver
George Bratton
Eric Cannon
Upper Pit
Lower Pit
DMP001
Site Entrance
Lynwood Barnes
Hunter
91
137
TN Technology Center
Sheriff Pierce
Watauga Industries
Brumit Island
Wagners Island
Blue Springs Rd
Love's Ln
US Rte 19E
19E
321
City of Elizabethton
Elizabethton
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Please print or type in the unshaded areas only.

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)
TN0068977

Form Approved.
OMB No. 2040-0086.
Approval expires 3-31-98.

FORM **2C** NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURE OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (*list*)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (*name*)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	36.00	22.00	43.00	82.00	10.00	56.00	Davis Branch
SW-001	36.00	22.00	27.00	82.00	11.00	0.00	Roadside ditch to Davis Branch

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (*e.g., for certain mining activities*), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (*list*)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (*list*)	b. AVERAGE FLOW (*include units*)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
001	Quarry pit sump dewatering, excess	0-250 GPM	Settling Basins (SB-1, SB-2) & Settling Pond (P-1)	1-U	1-F
	process/wet suppression water			1-G	4-A
	& storm water runoff			4-C	
			Sediment removed from settling ponds is placed in overburden storage area.		
SW001	Storm water runoff from entrance	0-10 GPM	Settling basin (SWB-1)	1-U	1-F
	road			4-A	
			Sediment removed from settling ponds is placed in overburden storage area.		

OFFICIAL USE ONLY (*effluent guidelines sub-categories*)

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☑ YES (*complete the following table*) ☐ NO (*go to Section III*)

1. OUTFALL NUMBER (*list*)	2. OPERATION(s) CONTRIBUTING FLOW (*list*)	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK (*specify average*)	b. MONTHS PER YEAR (*specify average*)	a. FLOW RATE (*in mgd*)		B. TOTAL VOLUME (*specify with units*)		C. DURATION (*in days*)
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
001	Quarry pit dewatering, excess process/wet suppression water, & stormwater	<1	12	unknown	unknown	unknown	unknown	
003	Storm water	<1	12	unknown	unknown	unknown	unknown	

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☑ YES (*complete Item III-B*) ☐ NO (*go to Section IV*)

B. Are the limitations in the applicable effluent guideline expressed in terms of production (*or other measure of operation*)?

☐ YES (*complete Item III-C*) ☑ NO (*go to Section IV*)

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS (*list outfall numbers*)
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. (*specify*)	
N/A	N/A	N/A	N/A

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operations of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES (*complete the following table*) ☑ NO (*go to Item IV-B*)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (*or other environmental projects which may affect your discharges*) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

 CONTINUE ON PAGE 3

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V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding – Complete one set of tables for each outfall – Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
N/A	N/A	N/A	N/A

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES (*list all such pollutants below*) ☑ NO (*go to Item VI-B*)

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES (*identify the test(s) and describe their purposes below*) ☑ NO (*go to Section VIII*)

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☑ YES (*list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below*) ☐ NO (*go to Section IX*)

A. NAME	B. ADDRESS	C. TELEPHONE (*area code & no.*)	D. POLLUTANTS ANALYZED (*list*)
Microbac Laboratories, Inc. (Johnson City, TN)	2109 W. Market Street, Suite 177 Johnson City, TN 37604	(423) 926-6385	TSS, pH (as necessary)
Microbac Laboratories, Inc. (Maryville, TN)	505 East Broadway Avenue, Maryville, TN 37804	(865) 977-1200	TSS, pH (as necessary)
Aggregates USA, LLC	350 W. Fourth Avenue, Watauga, TN 37694	(423) 926-0111	pH (on site)

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE (*type or print*)	B. PHONE NO. (*area code & no.*)
Steven R. Bennett - Tri-Cities Region, Area Operations Manager	(423) 926-0111
C. SIGNATURE Steven R Bennett	D. DATE SIGNED 11/14/16

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages. SEE INSTRUCTIONS.

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V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO.: 001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	2. EFFLUENT a. MAXIMUM DAILY VALUE (2) MASS	2. EFFLUENT b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	2. EFFLUENT b. MAXIMUM 30 DAY VALUE (2) MASS	2. EFFLUENT c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	2. EFFLUENT c. LONG TERM AVRG. VALUE (2) MASS	2. EFFLUENT d. NO. OF ANALYSES	3. UNITS (*specify if blank*) a. CONCEN-TRATION	3. UNITS b. MASS	4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (*BOD*)												
b. Chemical Oxygen Demand (*COD*)												
c. Total Organic Carbon (*TOC*)												
d. Total Suspended Solids (*TSS*)	Unknown							mg/L				
e. Ammonia (*as N*)												
f. Flow	VALUE 0-250 GPM		VALUE 0-250 GPM		VALUE 0 GPM					VALUE		
g. Temperature (*winter*)	VALUE NA		VALUE NA		VALUE			°C		VALUE		
h. Temperature (*summer*)	VALUE NA		VALUE NA		VALUE			°C		VALUE		
i. pH	MINIMUM 6.0	MAXIMUM 9.0	MINIMUM 6.0	MAXIMUM 9.0				STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X" a. BELIEVED PRESENT	2. MARK "X" b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	3. EFFLUENT a. MAXIMUM DAILY VALUE (2) MASS	3. EFFLUENT b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	3. EFFLUENT b. MAXIMUM 30 DAY VALUE (2) MASS	3. EFFLUENT c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	3. EFFLUENT c. LONG TERM AVRG. VALUE (2) MASS	3. EFFLUENT d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	4. UNITS b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual		X												
c. Color		X												
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)		X												
f. Nitrate-Nitrite (*as N*)		X												

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ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (*as N*)		X												
h. Oil and Grease		X												
i. Phosphorus (as P), Total (7723-14-0)		X												
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (*as SO_4*) (14808-79-8)		X												
l. Sulfide (*as S*)		X												
m. Sulfite (*as SO_3*) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)		X												
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

 CONTINUE ON PAGE V-3

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
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CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total (7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)			X												
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)			X												
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

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CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (*Chloromethyl*) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodibromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloroethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichlorobromomethane (75-27-4)			X												
13V. Dichlorodifluoromethane (75-71-8)			X												
14V. 1,1-Dichloroethane (75-34-3)			X												
15V. 1,2-Dichloroethane (107-06-2)			X												
16V. 1,1-Dichloroethylene (75-35-4)			X												
17V. 1,2-Dichloropropane (78-87-5)			X												
18V. 1,3-Dichloropropylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

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CONTINUED FROM PAGE V-4

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloro-ethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloro-ethane (71-55-6)			X												
28V. 1,1,2-Trichloro-ethane (79-00-5)			X												
29V Trichloro-ethylene (79-01-6)			X												
30V. Trichloro-fluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichloro-phenol (120-83-2)			X												
3A. 2,4-Dimethyl-phenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitro-phenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachloro-phenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichloro-phenol (88-05-2)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (*a*) Anthracene (56-55-3)			X												
6B. Benzo (*a*) Pyrene (50-32-8)			X												
7B. 3,4-Benzo-fluoranthene (205-99-2)			X												
8B. Benzo (*ghi*) Perylene (191-24-2)			X												
9B. Benzo (*k*) Fluoranthene (207-08-9)			X												
10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1)			X												
11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4)			X												
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)			X												
13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloro-naphthalene (91-58-7)			X												
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (*a,h*) Anthracene (53-70-3)			X												
20B. 1,2-Dichloro-benzene (95-50-1)			X												
21B. 1,3-Di-chloro-benzene (541-73-1)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichloro-benzene (106-46-7)			X												
23B. 3,3-Dichloro-benzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131 -11-3)			X												
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitro-toluene (121-14-2)			X												
28B. 2,6-Dinitro-toluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenyl-hydrazine (*as Azo-benzene*) (122-66-7)			X												
31B. Fluoranthene (206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachloro-benzene (118-74-1)			X												
34B. Hexachloro-butadiene (87-68-3)			X												
35B. Hexachloro-cyclopentadiene (77-47-4)			X												
36B Hexachloro-ethane (67-72-1)			X												
37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitro-sodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X												

CONTINUE ON REVERSE

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Tri-chlorcbenzene (120-82-1)			X												
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Enosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

 CONTINUE ON PAGE V-9

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
TN0068977	001

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

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PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets (*use the same format*) instead of completing these pages. SEE INSTRUCTIONS.

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V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO.: SW001

PART A –You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	3. UNITS (*specify if blank*) a. CONCEN-TRATION	3. UNITS b. MASS	4. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand (*BOD*)												
b. Chemical Oxygen Demand (*COD*)												
c. Total Organic Carbon (*TOC*)												
d. Total Suspended Solids (*TSS*)	Unknown							mg/L				
e. Ammonia (*as N*)												
f. Flow	VALUE 0-10 GPM		VALUE 0-10 GPM		VALUE 0 GPM					VALUE		
g. Temperature (*winter*)	VALUE NA		VALUE NA		VALUE			°C		VALUE		
h. Temperature (*summer*)	VALUE NA		VALUE NA		VALUE			°C		VALUE		
i. pH	MINIMUM 5.0	MAXIMUM 9.0	MINIMUM 5.0	MAXIMUM 9.0				STANDARD UNITS				

PART B – Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X" a. BELIEVED PRESENT	2. MARK "X" b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (*if available*) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (2) MASS	c. LONG TERM AVRG. VALUE (*if available*) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCEN-TRATION	4. UNITS b. MASS	5. INTAKE (*optional*) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)		X												
b. Chlorine, Total Residual		X												
c. Color		X												
d. Fecal Coliform		X												
e. Fluoride (16984-48-8)		X												
f. Nitrate-Nitrite (*as N*)		X												

 CONTINUE ON REVERSE

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ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (*if available*)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic (*as N*)		X												
h. Oil and Grease		X												
i. Phosphorus (as P), Total (7723-14-0)		X												
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (*as* SO_4) (14808-79-8)		X												
l. Sulfide (*as S*)		X												
m. Sulfite (*as* SO_3) (14265-45-3)		X												
n. Surfactants		X												
o. Aluminum, Total (7429-90-5)		X												
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)		X												
t. Magnesium, Total (7439-95-4)		X												
u. Molybdenum, Total (7439-98-7)		X												
v. Manganese, Total (7439-96-5)		X												
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

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EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
TN0068977	SW001

CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a (*secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions*), mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (*all 7 pages*) for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)			X												
2M. Arsenic, Total (7440-38-2)			X												
3M. Beryllium, Total (7440-41-7)			X												
4M. Cadmium, Total (7440-43-9)			X												
5M. Chromium, Total (7440-47-3)			X												
6M. Copper, Total (7440-50-8)			X												
7M. Lead, Total (7439-92-1)			X												
8M. Mercury, Total (7439-97-6)			X												
9M. Nickel, Total (7440-02-0)			X												
10M. Selenium, Total (7782-49-2)			X												
11M. Silver, Total (7440-22-4)			X												
12M. Thallium, Total (7440-28-0)			X												
13M. Zinc, Total (7440-66-6)			X												
14M. Cyanide, Total (57-12-5)			X												
15M. Phenols, Total			X												
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)			X	DESCRIBE RESULTS											

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Accrolein (107-02-8)			X												
2V. Acrylonitrile (107-13-1)			X												
3V. Benzene (71-43-2)			X												
4V. Bis (*Chloro-methyl*) Ether (542-88-1)			X												
5V. Bromoform (75-25-2)			X												
6V. Carbon Tetrachloride (56-23-5)			X												
7V. Chlorobenzene (108-90-7)			X												
8V. Chlorodi-bromomethane (124-48-1)			X												
9V. Chloroethane (75-00-3)			X												
10V. 2-Chloro-ethylvinyl Ether (110-75-8)			X												
11V. Chloroform (67-66-3)			X												
12V. Dichloro-bromomethane (75-27-4)			X												
13V. Dichloro-difluoromethane (75-71-8)			X												
14V. 1,1-Dichloro-ethane (75-34-3)			X												
15V. 1,2-Dichloro-ethane (107-06-2)			X												
16V. 1,1-Dichloro-ethylene (75-35-4)			X												
17V. 1,2-Dichloro-propane (78-87-5)			X												
18V. 1,3-Dichloro-propylene (542-75-6)			X												
19V. Ethylbenzene (100-41-4)			X												
20V. Methyl Bromide (74-83-9)			X												
21V. Methyl Chloride (74-87-3)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – VOLATILE COMPOUNDS (*continued*)															
22V. Methylene Chloride (75-09-2)			X												
23V. 1,1,2,2-Tetrachloroethane (79-34-5)			X												
24V. Tetrachloro-ethylene (127-18-4)			X												
25V. Toluene (108-88-3)			X												
26V. 1,2-Trans-Dichloroethylene (156-60-5)			X												
27V. 1,1,1-Trichloro-ethane (71-55-6)			X												
28V. 1,1,2-Trichloro-ethane (79-00-5)			X												
29V Trichloro-ethylene (79-01-6)			X												
30V. Trichloro-fluoromethane (75-69-4)			X												
31V. Vinyl Chloride (75-01-4)			X												
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)			X												
2A. 2,4-Dichloro-phenol (120-83-2)			X												
3A. 2,4-Dimethyl-phenol (105-67-9)			X												
4A. 4,6-Dinitro-O-Cresol (534-52-1)			X												
5A. 2,4-Dinitro-phenol (51-28-5)			X												
6A. 2-Nitrophenol (88-75-5)			X												
7A. 4-Nitrophenol (100-02-7)			X												
8A. P-Chloro-M-Cresol (59-50-7)			X												
9A. Pentachloro-phenol (87-86-5)			X												
10A. Phenol (108-95-2)			X												
11A. 2,4,6-Trichloro-phenol (88-05-2)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)			X												
2B. Acenaphtylene (208-96-8)			X												
3B. Anthracene (120-12-7)			X												
4B. Benzidine (92-87-5)			X												
5B. Benzo (*a*) Anthracene (56-55-3)			X												
6B. Benzo (*a*) Pyrene (50-32-8)			X												
7B. 3,4-Benzo-fluoranthene (205-99-2)			X												
8B. Benzo (*ghi*) Perylene (191-24-2)			X												
9B. Benzo (*k*) Fluoranthene (207-08-9)			X												
10B. Bis (*2-Chloro-ethoxy*) Methane (111-91-1)			X												
11B. Bis (*2-Chloro-ethyl*) Ether (111-44-4)			X												
12B. Bis (*2-Chloroisopropyl*) Ether (102-80-1)			X												
13B. Bis (*2-Ethyl-hexyl*) Phthalate (117-81-7)			X												
14B. 4-Bromophenyl Phenyl Ether (101-55-3)			X												
15B. Butyl Benzyl Phthalate (85-68-7)			X												
16B. 2-Chloro-naphthalene (91-58-7)			X												
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)			X												
18B. Chrysene (218-01-9)			X												
19B. Dibenzo (*a,h*) Anthracene (53-70-3)			X												
20B. 1,2-Dichloro-benzene (95-50-1)			X												
21B. 1,3-Di-chloro-benzene (541-73-1)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
22B. 1,4-Dichloro-benzene (106-46-7)			X												
23B. 3,3-Dichloro-benzidine (91-94-1)			X												
24B. Diethyl Phthalate (84-66-2)			X												
25B. Dimethyl Phthalate (131 -11-3)			X												
26B. Di-N-Butyl Phthalate (84-74-2)			X												
27B. 2,4-Dinitro-toluene (121-14-2)			X												
28B. 2,6-Dinitro-toluene (606-20-2)			X												
29B. Di-N-Octyl Phthalate (117-84-0)			X												
30B. 1,2-Diphenyl-hydrazine (*as Azo-benzene*) (122-66-7)			X												
31B. Fluoranthene (206-44-0)			X												
32B. Fluorene (86-73-7)			X												
33B. Hexachloro-benzene (118-74-1)			X												
34B. Hexachloro-butadiene (87-68-3)			X												
35B. Hexachloro-cyclopentadiene (77-47-4)			X												
36B Hexachloro-ethane (67-72-1)			X												
37B. Indeno (*1,2,3-cd*) Pyrene (193-39-5)			X												
38B. Isophorone (78-59-1)			X												
39B. Naphthalene (91-20-3)			X												
40B. Nitrobenzene (98-95-3)			X												
41B. N-Nitro-sodimethylamine (62-75-9)			X												
42B. N-Nitrosodi-N-Propylamine (621-64-7)			X												

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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (*continued*)															
43B. N-Nitro-sodiphenylamine (86-30-6)			X												
44B. Phenanthrene (85-01-8)			X												
45B. Pyrene (129-00-0)			X												
46B. 1,2,4-Tri-chlorobenzene (120-82-1)			X												
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)			X												
2P. α-BHC (319-84-6)			X												
3P. β-BHC (319-85-7)			X												
4P. γ-BHC (58-89-9)			X												
5P. δ-BHC (319-86-8)			X												
6P. Chlordane (57-74-9)			X												
7P. 4,4'-DDT (50-29-3)			X												
8P. 4,4'-DDE (72-55-9)			X												
9P. 4,4'-DDD (72-54-8)			X												
10P. Dieldrin (60-57-1)			X												
11P. α-Enosulfan (115-29-7)			X												
12P. β-Endosulfan (115-29-7)			X												
13P. Endosulfan Sulfate (1031-07-8)			X												
14P. Endrin (72-20-8)			X												
15P. Endrin Aldehyde (7421-93-4)			X												
16P. Heptachlor (76-44-8)			X												

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EPA I.D. NUMBER (*copy from Item 1 of Form 1*)	OUTFALL NUMBER
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1. POLLUTANT AND CAS NUMBER (*if available*)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (*optional*)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (*if available*)		c. LONG TERM AVRG. VALUE (*if available*)		d. NO. OF ANALYSES	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION – PESTICIDES (*continued*)															
17P. Heptachlor Epoxide (1024-57-3)			X												
18P. PCB-1242 (53469-21-9)			X												
19P. PCB-1254 (11097-69-1)			X												
20P. PCB-1221 (11104-28-2)			X												
21P. PCB-1232 (11141-16-5)			X												
22P. PCB-1248 (12672-29-6)			X												
23P. PCB-1260 (11096-82-5)			X												
24P. PCB-1016 (12674-11-2)			X												
25P. Toxaphene (8001-35-2)			X												

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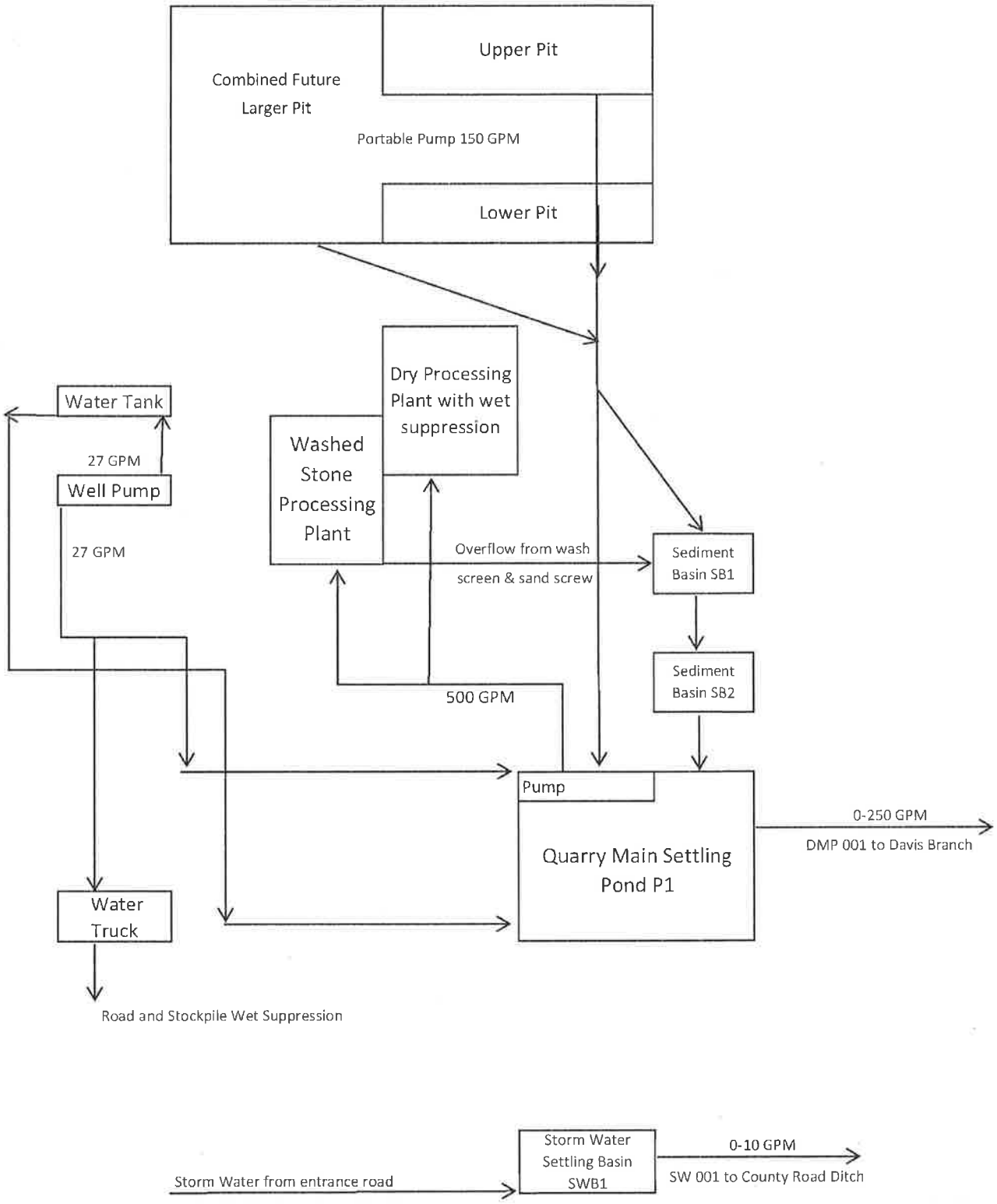

Note: Drawing not to scale. All flow rates shown are maximum rated pump capacities. Actual flow rates are less.

Drawing A - EPA Form 2C Water Flow Line Drawing
Aggregates USA (Elizabethton), LLC Quarry
210 Judge Ben Allen Road,
Carter County, Elizabethton , TN
36-22-48 N & 82-11-01W

Date: 12/20/2016

DEC 2 8 2016

State of Tennessee - Department of Environment and Conservation

Division of Water Resources - Surface Mining Section

Discharge Monitoring Report (DMR)

Permittee Name:	Aggregates USA (Elizabethton), LLC	NPDES #:	TN0068977
Address:	P.O. Box 15005	Site # / Name:	Elizabethton Quarry
City, State, Zip:	Knoxville, Tennessee 37901	Outfall #:	001
Phone Number:	(865) 573-7625	Rec. Stream:	Davis Branch
		County:	Carter

Parameter	Flow	pH	TSS								STORMWATER		
minimum		6.0									Reporting Levels		
maximum		9.0	40.0								pH	TSS	O&G
average											5 - 9	150	15
units	gpm	s.u.	mg/L								su	mg/L	mg/L
frequency	2 / mo	2 / mo	2 / mo								annual		
sample type	est.	grab	grab								grab		
Date			**max**								**SW1**		
1/1/2016-1/15/2016	ND										ND		
1/16/2016-1/31/2016	ND										ND		
2/1/2016-2/15/2016	ND										ND		
2/15/2016-2/29/2016	ND										ND		
3/1/2016-3/15/2016	ND										ND		
3/16/2016-3/31/2016	ND										ND		
4/1/2016-4/15/2016	ND										ND		
4/16/2016-4/30/2016	ND										ND		
5/1/2016-5/15/2016	ND										ND		
5/16/2016-5/31/2016	ND										ND		
6/1/2016-6/15/2016	ND										ND		
6/16/2016-6/30/2016	ND										ND		
7/1/2016-7/15/2016	ND										ND		
7/16/2016-7/31/2016	ND										ND		
8/1/2016-8/15/2016	ND										ND		
8/16/2016-8/31/2016	ND										ND		
9/1/2016-9/15/2016	ND										ND		
9/16/2016-9/30/2016	ND										ND		
10/1/2016-10/15/2016													
10/16/2016-10/31/2016													
11/1/2016-11/15/2016													
11/16/2016-11/30/2016													
12/1/2016-12/15/2016													
12/16/2016-12/31/2016													
Average													
Maximum	**0.0**	**0.0**	**0.0**										
Minimum		**0.0**											
Violations													

Name of Company(s) Collecting Samples and/or Performing Analyses: **Aggregates USA, LLC; Microbac Laboratories, Inc.**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 33 USC §1318; 40 CFR 125.27. (Penalties under these statues may include fines not to exceed $10,000 per day of violation, or in criminal penalties not to exceed $25, 000 per day of violation, or by imprisonment for not more than one year, or by both.)

Walt Hillis, Environmental Manager	Walt Hillis	10/6/16
Name & Title of Responsible Official	Signature	Date

COMMENTS and VIOLATIONS require a seperate memo to be submitted

DEC 2 8 2016

State of Tennessee - Department of Environment and Conservation

Division of Water Resources - Surface Mining Section

Discharge Monitoring Report (DMR)

Permittee Name:	Aggregates USA (Elizabethton), LLC	NPDES #:	TN0068977
Address:	P.O. Box 15005	Site # / Name:	Elizabethton Quarry
City, State, Zip:	Knoxville, Tennessee 37901	Outfall #:	001
Phone Number:	(865) 573-7625	Rec. Stream:	Davis Branch
		County:	Carter

Parameter	Flow	pH	TSS								STORMWATER Reporting Levels		
minimum		6.0											
maximum		9.0	40.0								pH	TSS	O&G
average											5 - 9	150	15
units	gpm	s.u.	mg/L								su	mg/L	mg/L
frequency	2 / mo	2 / mo	2 / mo.								annual		
sample type	est.	grab	grab								grab		
Date			max								SW1		
1/1/2015-1/15/2015	ND										NS		
1/16/2015-1/31/2015	ND										NS		
2/1/2015-2/15/2015	ND										NS		
2/15/2015-2/28/2015	ND										NS		
3/1/2015-3/15/2015	ND										NS		
3/16/2015-3/31/2015	ND										NS		
4/1/2015-4/15/2015	ND										NS		
4/16/2015-4/30/2015	ND										NS		
5/1/2015-5/15/2015	ND										NS		
5/16/2015-5/31/2015	ND										NS		
6/1/2015-6/15/2015	ND										NS		
6/16/2015-6/30/2015	ND										NS		
7/1/2015-7/15/2015	ND										NS		
7/16/2015-7/31/2015	ND										NS		
8/1/2015-8/15/2015	ND										NS		
8/16/2015-8/31/2015	ND										NS		
9/1/2015-9/15/2015	ND										NS		
9/16/2015-9/30/2015	ND										NS		
10/1/2015-10/15/2015	ND										NS		
10/16/2015-10/31/2015	ND										NS		
11/1/2015-11/15/2015	ND										NS		
11/16/2015-11/30/2015	ND										NS		
12/1/2015-12/15/2015	ND										NS		
12/16/2015-12/31/2015	ND										NS		
Average													
Maximum	0.0	0.0	0.0										
Minimum		0.0											
Violations													

Name of Company(s) Collecting Samples and/or Performing Analyses: **Aggregates USA, LLC; Microbac Laboratories, Inc.**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 33 USC §1318; 40 CFR 125.27. (Penalties under these statues may include fines not to exceed $10,000 per day of violation, or in criminal penalties not to exceed $25, 000 per day of violation, or by imprisonment for not more than one year, or by both.)

Walt Hillis, Environmental Manager	Walt Hillis	1/8/16
Name & Title of Responsible Official	Signature	Date

COMMENTS and VIOLATIONS require a seperate memo to be submitted

DEC 2 8 2016

State of Tennessee - Department of Environment and Conservation

Division of Water Pollution Control - Surface Mining Section

Discharge Monitoring Report (DMR)

Permittee Name:	*Aggregates USA (Elizabethton), LLC*	NPDES #:	*TN0068977*
Address:	*P.O. Box 15005*	Site # / Name:	*Elizabethton Quarry*
City, State, Zip:	*Knoxville, Tennessee 37901*	Outfall #:	*001*
Phone Number:	*(865) 573-4501*	Rec. Stream:	*Davis Branch*
		County:	*Carter*

Parameter	Flow	pH	TSS								STORMWATER		
minimum		6.0									Reporting Levels		
maximum		9.0	40.0								pH	TSS	O&G
average											5 - 9	150	15
units	gpm	s.u.	mg/L								su	mg/L	mg/L
frequency	2 / mo	2 / mo	2 / mo								annual		
sample type	est.	grab	grab								grab		
Date			**max**								**SW-001**		
1/1/2014-1/15/2014	ND										ND	ND	ND
1/16/2014-1/31/2014	ND												
2/1/2014-2/15/2014	ND												
2/15/2014-2/28/2014	ND												
3/1/2014-3/15/2014	ND												
3/16/2014-3/31/2014	ND												
4/1/2014-4/15/2014	ND												
4/16/2014-4/30/2014	ND												
5/1/2014-5/15/2014	ND												
5/16/2014-5/31/2014	ND												
6/1/2014-6/15/2014	ND												
6/16/2014-6/30/2014	ND												
7/1/2014-7/15/2014	ND												
7/16/2014-7/31/2014	ND												
8/1/2014-8/15/2014	ND												
8/16/2014-8/31/2014	ND												
9/1/2014-9/15/2014	ND												
9/16/2014-9/30/2014	ND												
10/1/2014-10/16/2014	ND												
10/17/2014-10/31/2014	ND												
11/1/2014-11/15/2014	ND												
11/16/2014-11/30/2014	ND												
12/1/2014-12/16/2014	ND												
12/17/2014-12/31/2014	ND												
Average	#DIV/0!	#####	#####	#####	#####	#####	#####	#####	#####	#####			
Maximum	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Minimum	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Violations													

Name of Company(s) Collecting Samples and/or Performing Analyses: **Aggregates USA, LLC & Microbac Labs Incorporated**

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See 18 USC §1001 & 33 USC §1319. (Penalties under these statues may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Walt Hillis, Environmental Manager, Aggregates USA, LLC — Walt Hillis — 1/8/15

Name & Title of Responsible Official — Signature — Date

COMMENTS and VIOLATIONS require a seperate memo to be submitted

DEC 2 8 2016

State of Tennessee - Department of Environment and Conservation

Division of Water Pollution Control - Surface Mining Section

Discharge Monitoring Report (DMR)

Permittee Name:	*Aggregates USA (Elizabethton), LLC*	NPDES #:	*TN0068977*
Address:	*P.O. Box 15005*	Site # / Name:	*Elizabethton Quarry*
City, State, Zip:	*Knoxville, Tennessee 37901*	Outfall #:	*001*
Phone Number:	*(865) 573-4501*	Rec. Stream:	*Davis Branch*
		County:	*Carter*

Parameter	Flow	pH	TSS								STORMWATER		
minimum		6.0									Reporting Levels		
maximum		9.0	40.0								pH	TSS	O&G
average											5 - 9	150	15
units	gpm	s.u.	mg/L								su	mg/L	mg/L
frequency	2 / mo	2 / mo	2 / mo								annual		
sample type	est.	grab	grab								grab		
Date			max								SW-001		
1/1/2013-1/15/2013	ND												
1/15/2013-1/16/2013	ND												
2/1/2013-2/15/2013	ND												
2/16/2013-2/28/2013	ND												
3/1/2013-3/15/2013	ND												
3/16/2013-3/31/2013	ND												
4/1/2013-4/15/2013	ND												
4/16/2013-4/30/2013	ND												
5/1/2013-5/15/2013	ND												
5/16/2013-5/31/2013	ND												
6/1/2013-6/15/2013	ND												
6/16/2013-6/30/2013	ND												
7/1/2013-7/15/2013	ND												
7/16/2013-7/31/2013	ND												
8/1/2013-8/15/2013	ND												
8/16/2013-8/31/2013	ND												
9/1/2013-9/15/2013	ND												
9/16/2013-9/30/2013	ND												
10/1/2013-10/15/2013	ND												
10/16/2013-10/31/2013	ND												
11/1/2013-11/15/2013	ND												
11/16/2013-11/30/2013	ND												
12/1/2013-12/15/2013	ND												
12/16/2013-12/31/2013	ND												
Average	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
Maximum	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Minimum	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Violations													

Name of Company(s) Collecting Samples and/or Performing Analyses: **Aggregates USA, LLC & Microbac Labs Incorporated**

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See 18 USC §1001 & 33 USC §1319. (Penalties under these statues may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Travis A. Paris, Environmental Manager, Aggregates USA, LLC — Travis A. Paris — 1/13/14

Name & Title of Responsible Official — Signature — Date

COMMENTS and VIOLATIONS require a seperate memo to be submitted

ND = No Discharge

DEC 2 8 2016

Antidegradation Guidance

To Be Used When Administering Tennessee's Antidegradation Statement as Associated with Obtaining a National Pollutant Discharge Elimination System (NPDES) Permit or an Individual Aquatic Alteration Permit (ARAP)

This document is intended to provide guidance for satisfying *Tennessee's Antidegradation Statement Rule 1200-4-3-.06* as it pertains to completing the application requirements for a NPDES or an ARAP permit.

As stated in *Tennessee's Antidegradation Statement Rule 1200-4-3-.06*, an applicant may choose to substitute equivalent information for the EPA Antidegradation forms. This document is intended to serve as that equivalent information. However, if preferred, the applicant may choose to use the EPA Worksheets listed below.

Parts 1 – 3 of this form are to be completed when performing an alternative analysis with reference to the social and economic considerations and environmental consequences for each alternative. Parts 1 - 3 serve as equivalent information to EPA Worksheets A and G (A and B for the public sector).

If the receiving water is an Exceptional Tennessee Water, and the proposed discharge will cause degradation, then the applicant must provide more detailed and comprehensive information to show that the proposed degradation is justified economically and socially. As part of this process, the applicant is to complete the entire Antidegradation Guidance Form (Parts 1 – 5). This information is to serve as equivalent information for EPA Worksheets A, G, O, R, V, W, X, Y, Z, and AB (O, P, Q, S, T, U, and AA for the public sector).

Part 1. Contact Information	
1. Company name:	Aggregates USA, LLC
2. NPDES No.: TN00	68977
3. Facility or mine name:	Aggregates USA (Elizabethton), LLC Quarry
4. County:	Carter
5. Name of contact person:	Walt Hillis
6. Facility or mine address:	210 Judge Ben Allen Road
7. City:	Elizabethton
8. State:	TN
9. Zip:	37643

Part 3. Alternatives Analysis

The following are examples of alternatives relative to natural resource extraction that are to be considered by applicants under Tennessee's *Antidegradation Statement 1200-4-3-.06 (3)(a)*. Please indicate if you have considered this option and implemented it at your facility. Discuss the social and economic considerations and environmental consequences of each alternative considered and/or implemented. Describe any other alternative options as they apply to your facility. Attach additional pages if necessary to fully characterize the alternatives analysis at the facility.

1. Indicate which alternative process or treatment options are currently used at the facility and state the reasons others were not considered feasible. Include the social and economic considerations and environmental consequences for each alternative.

- Connection to existing treatment system.

The existing ponds/pits are sufficient to handle all water processing needs. No new discharge points are proposed. What is recycled and conserved as much as possible to meet operation needs for wash water for stone processing and wet suppression water to comply with air permit limitations. Water can be pumped from quarry pit or well to ponds, processing plant, and water truck as necessary for use. If a discharge from a pond via a permitted discharge point is necessary it occurs via an overflow pipe to Davis Branch.

- Construction of oversized ponds to receive wastewater.

Pit and pond capacity and designed pond calculations are the planned designs at this location.

4. Evaluate the type of mining used at the site. Would another type of mining result in a reduction in quantity or improvement in quality of the discharge from the site?

Conventional open quarry pit mining, drilling, and blasting for rock removal. Alternative mining techniques wouldn't be applicable for this site. Change of mining type wouldn't amount in a reduction of quantity or improvement in quality of site discharges.

5. Were other locations for the facility evaluated? Describe the reasons why other locations were selected or rejected.

This is an ongoing quarrying activity. The location is dictated by rock quality/quantity, availability of land that can be properly zoned/permitted, and proximity to markets. Development of new sites is typically rejected by local governments with allowance being made for expansion of existing operations. This operation is in an area within 1.5 miles of the Elizabethton Airport, an Industrial Park, and Landfill.
Major funds have been expended in developing the site. Relocation is financially Prohibitive and would entail the abandonment of known permitted quality reserves.

6. List any alternative process or treatment options that were considered, for example, land application of wastewater. Discuss which options were selected and why they were.

There are currently no alternative uses of this wastewater other than on-site recycle and inclusion to a minor extent in products. There is no land available for land application of wastewater. Currently discharges are minor in extent. Influx of water from the surrounding areas hasn't presented a problem.

7. Evaluation of natural resource extraction locations. How long has the company mined at this location? If the option to mine has been reserved through payments to the owner or lessor of the rights, how long has that option been reserved?

The Elizabethton Quarry as it currently exists began operation in approximately 1994. Prior to this date various other entities had operated sand operations on the properties. Aggregates USA, LLC leases/controls approximately 287 acres of which approximately acres are proposed for quarry operations.

8. Other pollution prevention control options in use or proposed for use at the facility.

Erosion prevention and Sediment control BMPs will be installed as necessary for disturbed areas.

Parts 4 and 5 are to be completed by the applicant if the receiving water is an Exceptional Tennessee Water, as per Tennessee's *Antidegradation Statement 1200-4-3-.06 (4)(c) and (d).* In this case, the applicant must provide the Division with additional detailed and comprehensive information, as well as public notice, and public participation. These additional requirements are detailed in the "Antidegradation Guidance" instructional section that is found on page 8 of this document.

Part 4. Economic Justification

The following section shows economic/financial information for the facility. This information is necessary to determine if the applicant can afford to implement appropriate pollution control measures to protect water quality in the receiving water. Attach additional pages if needed.

1. Annual cost of operation and maintenance of pollution control project (including but not limited to monitoring, inspection, permitting fees, waste disposal charges, repair, administration, and replacement).	$
2. Annual earnings without pollution control project costs	$
3. Annual earnings with pollution control project costs	$

Part 5. Social Justification

The following section shows social justification of the proposed degradation within the community where the facility is located. Attach additional pages if needed.

1. Define the affected community in this case; what areas are included.	
2. Current unemployment rate in affected community (if available).	
3. Current national unemployment rate.	
4. Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards.	

posting process. The information requirements for these types of applications are as follows:

1. *Complete and submit the Draft Guidance document or the EPA worksheets. These documents will describe the social and economic justification for the proposed degradation, including the alternatives analysis that was considered in the proposal.*

2. *Show that the discharge will not interfere with the classified uses of the receiving stream. The criteria for these uses are also contained in Chapter 1200-4-3 of the Rules.*

3. *Publish a newspaper ad with the following information: identify the proposed discharge, provide the specific location, including affected waters, describe the general basis for your request to degrade Exceptional Tennessee Waters, inform the public of the opportunity to comment, announce a forthcoming public meeting in the local area, (to be held by the Division at least 45 days after the announcement), provide Division contact information for comments or hearing location and date. Comments and questions should be addressed to:*

   Gary W. Mullins
   NPDES Permitting Supervisor
   Division of Water Pollution Control
   3711 Middlebrook Pike
   Knoxville, TN 37921-6538
   (865) 594-5536
   gary.mullins@tn.gov

4. *Post a sign near the site with the same information as in the newspaper ad. The sign must be legible from the nearest public road. An example sign is attached for your reference.*

5. *Proof of the sign posting and a copy of the newspaper ad must be submitted to the Division. Once the information requested above is received, the Division will schedule a public meeting about your proposed degradation. Announcement of this meeting will be placed on public notice for a minimum of 45 days. The meeting will not be scheduled until your information is received. After the meeting is a 10 day comment period. After this period, we consider comments and issue a Notice of Determination that the degradation is either justified or not justified. If justified, the Draft permit is issued and the normal permit process follows. If not justified, the permit is denied and the applicant may appeal.*

- If you are **renewing a permit with no changes that discharges to Non Exceptional Tennessee Waters (NETW)**, you do not need to complete this form. However, it's a good idea to complete Parts 1 through 3 and have them in the file.

- If you are **applying for a new or expanded permit that discharges to Non Exceptional Tennessee Waters (NETW),** you need to complete the alternatives analysis requirement. However, you do not have to complete the social and economic justification section or go through the public meeting process. So, you would fill out Part 1 through 3 of the Antidegradation Guidance document.

5. Expected unemployment rate in the affected community after compliance with water quality standards (Current number of persons collecting unemployment in affected community + (4)/labor force in affected community.	
6. Number of jobs facility provides in the affected community.	
7. Average salary of these jobs.	$
8. Median household income in affected community.	$
9. Total number of households in affected community.	
10. Current total tax revenues in the affected community.	$
11. Tax revenues paid by the private entity to the affected community.	$

How to use the Antidegradation Guidance document

The Antidegradation Guidance document is to be used in accordance with the State of Tennessee's Antidegradation Statement. It may be used in lieu of the EPA Worksheets. Specifically the document is divided into five parts. Parts 1 -2 are general information regarding the facility. Part 3 details the alternatives analysis (including social, economic, and environmental considerations of each alternative). Parts 4 – 5 detail the social and economic justification required to demonstrate that the degradation associated with the proposed discharge is justified. Please review this form. The following explanation should help explain this process.

- If you are **renewing a permit with no changes that discharges to Exceptional Tennessee Waters (ETW)**, you need to complete the alternatives analysis requirement. However, you do not have to complete the social and economic justification requirements or go through the public meeting process. So, you would fill out Part 1 through 3 of the Antidegradation Guidance document.

- If you are **applying for a new or expanded permit that discharges to Exceptional Tennessee Waters (ETW),** you need to complete all parts (Parts 1 - 5) of the Antidegradation Guidance document. This would also trigger the public meeting and

9. Describe the proposed mitigation activity for the ARAP.
No new ARAPs are proposed during the five year term of the NPDES Permit being applied for.

- Diverting off-site flow away from treatment structures.

Where possible, off-site flow has been diverted by use of berms. The quarry pit is the preferred method of treatment of process water, pit inflow, and storm water in disturbed areas. Current topography and site grading allows for this preferred treatment method. Sedimentation retention basins/sumps were constructed as needed to manage flows not controlled by the quarry pit and to receive pump out.

- Using pit storage as primary treatment.

The quarry pit is used as a primary settling and treatment structure. Water is pumped from the pit to Pond 1. Water from Pond 1 is pumped to the plant for use.

- Construction of additional treatment, for example using ponds in series.

Sediment Basins 1 & 2 are in series. These basins receive water from the processing Plant and overflow as necessary to Pond 1.

2. Is there another discharge location that would have less impact on the watershed?

No, water must be discharged to surface waters or additional permits obtained to pump to karst features.

3. Describe any water reuse or water recycling used at the facility. What level of water reuse or recycling is possible? What percentage of the total wastewater load may be reused or recycled?

Waste (process) water is currently reused/recycled at the site when the plant operates. Evaporation percolation, and entrapment in the product sold and shipped from the site accounts for a vast amount of the water usage on-site. Discharges to surface waters are limited and are dependent on rainfall.

Part 2. Mine and Stream Information

1. Please select the type of mine.

☑ Noncoal ☐ Coal

☑ Limestone ☐ Shale

☐ Sand and Gravel ☐ Dimension Stone

☐ Industrial Sand ☐ Zinc

☐ Ball Clay

✓ Sandstone

2. Check which type of permit activity is requested by applicant.

____ Renewal of permit based on currently approved plans
__X__ Renewal and modification of permit
____ Modification of permit
____ New permit
____ Termination of permit
____ Individual Aquatic Resource Alteration Permit

3. Please list each outfall number, the name of receiving stream(s) and the corresponding stream designation (either Outstanding National Resource Water (ONRW), Exceptional Tennessee Water (ETW), or Non Exceptional Tennessee Water (Non ETW). Use separate paper if necessary.

Outfall(s)	Receiving Stream(s)	Stream Designation		
		ONRW	ETW	NON ETW
001	Davis Branch			X
SW001	Roadside ditch to Davis Branch			X

NARRATIVE FOR NPDES PERMIT MODIFICATION APPLICATION
(November 14, 2016)

DEC 2 8 2016

AGGREGATES USA (ELIZABETHTON), LLC QUARRY

Reason for Application

The current NPDES Permit (TN0068977) for the Elizabethton Quarry expires on February 4, 2019. This application is to modify the current permit to include additional permitted acreage. The additional acreage will allow for the increase in product stockpile area, overburden placement area, and quarry pit area. The current permitted acreage is 26 acres and the proposed new permit acreage would be approximately 77.1 acres. Because the renewal application date for the permit would occur in the summer of 2018, Aggregates USA, LLC requests that the permit be revoked and reissued for a new five year term with this modification in order to avoid having to complete and file another application in the near future.

Site Information

Aggregates USA, LLC leases approximately 287 acres of surface and mineral rights at the Elizabethton Quarry and approximately 111.5 acres of this area are shown on the enclosed Permit Maps. The remaining acreage is located north of the current and proposed permit areas and won't be affected in the current permit cycle.

The main entrance to the permitted portion of the quarry is at 210 Judge Ben Allen Road, about 3½ miles northeast of downtown Elizabethton, Carter County, Tennessee. The site can be reached by driving east on U.S. 321 from Johnson City and through Elizabethton to the junction with U.S. 19E. At the junction with U.S. 19E turn left, cross the Watauga River and immediately exit right (eastward) to Tennessee Highway 91 towards Carter and Mountain City. Go about one mile on 91, then turn left (northward) onto Judge Ben Allen Road just as you reach the airport. Continue north on Judge Ben Allen Road for about ½-mile. The quarry entrance is on the right, just after making a 90° left turn.

Operational Information

Aggregates USA, LLC purchased the operation on February 5, 2010. The operation was originally initiated in its current form as a quarry by American Limestone Company who purchased the plant of Split Rock Sand and Gravel Company, Inc. and leased the land and reserves from Gary Hyder in approximately late September 1993. Split Rock (Hyder) had developed a small stone crushing and screening plant in 1992 and began cutting access roads, haul roads, and development of two pits. Stone sales from the site by Split Rock apparently began in early 1993 and continued until the time American Limestone took over the property. American Limestone directed Split Rock to cease mining before American Limestone took possession of the property. At that point mining ceased.

American Limestone took possession of the property and began activity to redesign and rebuild the plant and to obtain appropriate permits in order to resume quarrying in early 1994. A construction permit for the plant was obtained from the Tennessee Department of Environment and Conservation's Division of Air Pollution Control. An NPDES permit (TN0068977) for discharge of stormwater and process water from the site was issued on April 6, 1994 by the Division of Water Pollution Control. American Limestone Company initiated operations with issuance of the permit.

American Limestone Company, Inc. actively quarried and processed stone at the Elizabethton Quarry from April 1994 to December 1995, with sales and removal of equipment continuing until the end of December 1996. The site was in idle status from that time until Aggregates USA, LLC began on-site work in 2014 to prepare the site for operations. The new processing plant started up in May 2015.

Third Party Facilities

There is no third party facilities (e.g. asphalt or ready mix concrete plants) located on the Elizabethton Quarry site.

Geology/Geomorphology

The Elizabethton Quarry is located on the lower slopes of the south side of Holston Mountain. The area is covered with a patchwork of pine and hardwood forests, cultivated areas, and pasture areas at the base of the mountain. Most housing is at the base of the mountain in flat areas or on gentle, rolling slopes. The area of the leased properties on the lower side of the mountain, including the Elizabethton Quarry affected area, contains sandstone bluffs and some scree slopes. Colluvium as much as 100 feet thick occurs in the larger valleys at the break in slope at the base of the mountain. It is comprised of sandstone debris ranging in size from silt to large boulders. Davis Branch flows through a colluvium-choked valley.

The stratigraphy in the area of the Elizabethton Quarry is comprised of the Erwin Formation (dominantly sandstone) overlain by the Shady Formation (dominantly dolostone and limestone). The small ridges and "flat" areas at the base of the mountain are underlain by Shady Formation carbonates, exposed in scattered outcrops and in the cut made when building the entrance road. The area at the break in slope in the plant area to the lower of the two quarry pits is underlain by a mixed sequence of shale and sandstone known as the Helenmode Member of the Erwin Formation. The two quarry pits in the affected area are opened in the Hesse Member of the Erwin Formation, a clean sandstone interval with very little in the way of shale partings or other contaminants, which occurs immediately below the Helenmode Member. Folding has tilted the stratigraphy such that as you proceed from the entrance at Judge Ben Allen Road up the mountain, you go progressively down in the stratigraphic section.

Location Map

The Location Map (Map 1) for this permit application is from the south central edge of the Keenburg, Tennessee 7½' quadrangle (DMA 4556 I NW-Series V841) and the north central edge of the Elizabethton, Tennessee 7½' quadrangle (AMS 4556 I SW-Series V841). Scale is 1-inch = 2,000 feet. Additional information is as follows:

Public and private sources of water supply: The First Utility District of Carter County serves homes south of the quarry along Judge Ben Allen Road. The City of Elizabethton Water Department and First Utility District of Carter County serve businesses, houses, apartments, and the airport along Tennessee Highway 91. Residences along the landfill road and surrounding that area are served by the North Elizabethton Utility District. A list of registered water wells within a quarter mile area of the quarry that was obtained from TDEC-Division of Water Resources is located in Section 3 of the permit application.

Site Conditions

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1. Areas under lease or owned:

Aggregates USA, LLC leases three parcels of land (028 008, 028 001, & 035 017.02) from Gary Hyder and/or his company Construction and Paving Services (CAPS) and one parcel (028 007) from Betty Moore Pritchard. The land outlined on Map 2 & Map 3 with a solid black line depicts three of these parcels. The dashed black lines on the maps are internal property lines depicting each parcel. The dashed red line depicts the proposed area to be permitted for quarrying and related activities. The fourth parcel is up the mountain (north) from the parcels depicted on the maps and it is not outlined because it wasn't surveyed because any activities on this parcel will occur far in the future.

2. Proposed permitted area:

The area previously disturbed by quarrying, plant operations, stockpiles, roads and other facilities is approximately 26 acres and with this application that area will increase to approximately 77.1 acres. The area that is and may be disturbed in the next five years by operations are depicted on the map in various colors, lines, and symbols as detailed in the legends on the maps. The proposed permitted area is divided into (7) Drainage Areas (A-G) and consists of 76.6 acres. There is approximately 0.5 acres of land in the northwest corner of the property proposed to be included in the permit that appears to not be in one of the (7) areas. This area is not proposed for disturbance in the next five years but before any disturbance to this area does ever occur a berm will be constructed to direct any runoff back into either Drainage Area D or E.

3. Areas affected by previous mining:

Quarrying has taken place previously (not by American Limestone Co., Rinker Materials, or Aggregates USA, LLC) on an area leased by Aggregates USA, LLC. This previously mined area is northwest of the presently permitted area (the CAPS leased property). Previous mining operations in that area were conducted by Mountain Sand and Gravel Company and by Appalachian Sand and Gravel Company. Drainage from those mining operations does not enter the present Aggregates USA, LLC mining area. It does enter Davis Branch via an unnamed tributary located west of the Aggregates USA, LLC operations. Responsibility for water discharges from these previous mining areas belongs to the present landowner.

4. Watershed into which runoff will drain: Watauga River (HUC 06010102)

Runoff from the quarry operation occurs in the form of sheet runoff, runoff from the access road, and overflow from the settling pond if necessary, which would flow into Davis Branch on the east side of the property. Some stormwater from the entrance road will flow south in ditches along Judge Ben Allen Road to Davis Branch. Davis Branch ultimately flows into the Watauga River on the south side of Tennessee Highway 91 after passes through various impoundments and culverts.

The discharge monitoring point for the main settling pond is at approximately 36° 22' 43" N. latitude; 82° 10' 56" W. longitude. This is the sample point for process water and stormwater discharge from the plant, point DMP001. Stormwater drains into ravines, draws, and into the quarry pits and is then directed to the settling pond. Some stormwater flows as sheet runoff and shallow channel flows into Davis Branch from undisturbed areas. Davis Branch and the unnamed tributary are marked and labeled on the Maps 2 & 3 of the application.

Site Map (Map 2) & Drainage Map (Map3)

The Maps for the Elizabethton Quarry are a 1-inch = 200-feet map with 10' contour intervals. The maps were prepared from an aerial flyover of the property in February 2016. The property is located on two different U.S.G.S. Topographic Maps (Keenburg and Elizabethton quadrangles).

1. Leased/Owned Parcels & Adjacent Property Owners:

Property lines for leased/owned parcels are show in solid and dashed black lines. Owners of the leased parcels along with adjacent property owners are labeled in black lettering and numbering on Map 2.

2. Water bodies in the vicinity of the quarry:

Davis Branch forms the eastern property line of the leased tract. The first property line at the upstream edge of the property is a common corner of Gary Hyder (Aggregates USA, LLC lease), the U.S. National Forest Service (Cherokee National Forest), and Christopher Hurt. No streams flow through the permitted area. To the west of the operations is an unnamed tributary to Davis Branch, which originates on the Construction and Paving Services (CAPS) parcel. This is the body of water that was evaluated by Griggs & Maloney Incorporated for Aggregates USA, LLC and the evaluation report dated September 2016 was submitted to the Division on November 9, 2016. On November 29, 2016 the Division issued a letter concurring with the report findings. This tributary flows via a culvert under Judge Ben Allen Road northwest of the quarry entrance and into a pond on the other side, overflows from the pond and sheet flows across some property, back through a culvert in the road, and into Davis Branch.

3. Previous mining activities in the immediate area of the quarry:

Aggregates USA, LLC and its predecessors have maintained NPDES and Air Permits for the facility since 1994 for quarrying activities on the property. There was a time between 1997 and 2015 that active quarrying was idle on the site.

Mountain Sand and Gravel (MSG) and/or Appalachian Sand and Gravel (ASG) operated a sand and crushed stone quarrying and processing operation northwest of the present site on lands now owned by Hyder Construction Company. Two pits are present, the larger at approximately 36° 23' 11.1" N. lat.; 82° 11' 29.6" W. long. There is potential for some runoff from these operations to enter Davis Branch via an unnamed tributary. While Aggregates USA, LLC has leased the reserves on the ASG/MSG tract from Hyder Construction Company (CAPS), there is no intent to mine on that property in the near future, and it is not made a part of this permit application.

5. Location of access and/or haul roads:

Access and haul roads are shown on Maps 2 and 3. Drainage from the internal haul and yard roads are directed via ditch and sloped to either the active pit, internal ditches, sediment traps, or eventually the facility sediment basins and/or pond. Berms are used along haul roads to comply with MSHA safety requirements and assist in directing overland water flow.

Storm water on the entrance road is directed to a rock lined ditch via sloping and speed bumps in the road. There are clean out points in the ditch and eventually water makes it way to the storm water basin (SWB-1) located at the corner of the entrance location on Judge Ben Allen Road.

6. Location of existing sedimentation structure(s): shown on maps in blue

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The main settling pond (Pond P1) is located across from the scale house and below the processing plant and product stockpile yard. This pond existed on site when American Limestone leased the property and from information that was obtained by them it appeared to have been built at some point prior to or in the early 1980's. This pond holds water but may seep very slowly into fractures in the underlying limestone. The pond is used as a source of water for dust suppression and making washed stone and sand. It also serves as the final sedimentation basin for water before discharge at discharge monitoring point (DMP) 001.

There are also two settling basins (SB1 and SB2) located up gradient from Pond P1. Settling takes place in these two smaller basins entrapping fines from the wash plant. Any water that overflows from these ponds discharges into Pond P1 where the water is pumped back to the plant for use.

7. Spoil placement, off-site storage areas and stockpiles:

There are no off-site storage areas. When possible overburden from the quarry site will be sold to customers as a viable fill material for off-site construction projects. The present and future overburden storage areas are shown on the maps in yellow. The generalized areas where stockpiles are and could be located are shown on the maps in gray around the plant and the new stockpile area (Area #2), which will be on top of an overburden storage area is shown in orange. The general layout of the plant is also shown on the map. This layout may change in minor detail over time as construction permits and operational flexibility approvals from TDEC Division of APC are applied for and received to either add or remove processing equipment.

8. Location of discharge points and monitoring points:

The process/storm water discharge monitoring point is marked on maps by a red triangle and is as follows:

Discharge monitoring point DMP-001 - Stormwater and plant process water (sand plant, dust suppression) discharge from Main Settling Pond (P1). Outfall location is at approximately 36° 22' 43" N. latitude; 82° 10' 56" W. longitude. This point is located in Carter County and discharges into Davis Branch

Storm water from the facility entrance road is monitored at the point marked on the maps by a black triangle at the intersection of the paved entrance road and Judge Ben Allen Road and is as follows:

Storm water monitoring point SW-001 – storm water from the facility entrance road discharge from storm water basin (SWB-1). Outfall locations is at approximately approximately 36° 22' 27" N. latitude; 82° 11' 0" W. longitude. This point is located in Carter County and discharge into ditches along Judge Ben Allen Road that eventually empty into Davis Branch.

9. Location of quarrying and direction of expansion:

In 1994 American Limestone originally began mining in the pit leftover from previous operators on site aka "Lower Pit" due to stability concerns they created the "Upper Pit" just north of this area and mined here until operations ceased in the mid 1990's. Aggregates USA, LLC began operating in the Upper Pit in 2015. Plans are to expand this pit to the north and west over the life of the next five year permit cycle. The area depicting the current and proposed expanded pit is labeled Area #4 on the maps and identified with a yellow/brown cross hatch.

10. Location of all water treatment structures:

Present sedimentation structures are shown in blue on the Site/Property Map – Map 2 and Drainage Map – Map 3. These include the Main Settling Pond (P1), two process water settling ponds associated with the plant and sand screw (SB1 & SB2), and a sediment trap/basin (SWB-1) for stormwater from the access road at the entrance to the property.

The approximate location of temporary erosion and sediment control structures are shown in brown below the expanded current overburden placement area and future product stockpile area (Area#2). These measures will be in place until good vegetative cover is established. Following establishment of good vegetation, these erosion and sediment control measures will be removed as appropriate and the area cleaned up.

The proposed berm around the product stockpile area (Area #2) will be constructed as the area is constructed. The rest of the berm between between the unnamed tributary to Davis Branch and overburden placement area (Area #3) will be constructed as necessary as the overburden area is developed over time. This berm is shown in green along the western side of Areas #2 and #3.

Special Technique Plans

None at this time

Monitoring Proposal

Currently there is one (1) permitted process discharge monitoring point at the quarry.

Discharge point 001 is a mixed discharge consisting of water from quarry dewatering, groundwater seepage into the pit, stormwater which has been routed across disturbed areas, stockpiles and plant equipment, and settled process water which has overflowed from the settling basins into the main settling pond. Water discharges via a metal culvert via overflow to Davis Branch.

The discharge point will be sampled during the first discharge during the first half of the month and during the first discharge of the second half of the month if a discharge occurs. Sample type will be grab and will be analyzed for pH and total suspended solids. Flow rate at the points of discharge will be estimated. Water is recycled as much as possible. The water is recycled through the dust suppression system, plant clean-up, and occasional stone washing. A small percentage of water used at the site is lost through evaporation and infiltration. Storm water from the access road will be monitored and sampled once annually if a point discharge occurs.

Reclamation

As necessary temporary reclamation of disturbed areas is an ongoing process and will consist of grading, fertilization, and liming of the soils in accordance when possible with recommendations of the USDA Natural Resources Conservation Service and UT Agricultural Extension. Plantings would consist of grasses and trees as advised by the Services and the landowner on leased lands.

Upon termination of mining the property will be reclaimed to the specifications of the Division as necessary to have the NPDES Permit released.

Water structures to remain would be the main settling pond, possibly the sediment basins, and the lake in the quarry pit, which could be used for recreation and/or a local water supply reservoir. Any other permanent ponds will most likely be used as stock watering ponds and where practical limited grading will slope the land allowing water to flow to the quarry pits.

DRAINAGE PLAN NARRATIVE
NPDES PERMIT APPLICATION (November 14, 2016)

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Drainage Map-Map 3

The Maps for the Elizabethton Quarry are a 1-inch = 200-feet map with 10' contour intervals. The maps were prepared from an aerial flyover of the property in February 2016. The property is located on two different U.S.G.S. Topographic Maps (Keenburg and Elizabethton quadrangles). The following details can be identified on Map 3.

A. Area to be disturbed including topsoil, overburden placement and stockpiles:

General areas where stockpiles will be located are shown on Map 3 in gray around the processing plant and with orange hatching on top of overburden placement Area #2. Present and future overburden placement areas are shown with yellow hatching and are identified as Areas #1 and #3. The current and proposed future quarry pit expansion are shown in brown hatching and identified as Area #4. The solid black lines are the external boundaries of the property parcels, the dashed black lines are the internal boundaries, and the red dashed line is the permitted area boundary.

B. Present drainage patterns:

Present drainage patterns are shown with dark blue arrows and the letter "P" on Map 3. Drainage from the quarry site and the surrounding area flows to Davis Branch either through a permitted outfall (001) or via a ditch along part of the entrance road to the sediment basin and then mixed with other water in ditches along Judge Ben Allen Road. Uncontaminated stormwater reaches Davis Branch by sheet flows from undisturbed areas to the unnamed tributary west of the property or sheet flow.

The Drainage Map is divided into a series of non-interconnected drainage basins, shown by purple lines and lettered "A" through "G". Data for these basins is shown in Table 1. This data includes the area of the drainage basins in acres, area of the basin within the permitted boundary, and area within the basin to be disturbed by mining or associated activity within the next five years. The Army Corp of Engineer's Hydrologic Modeling System (**HEC-HMS**) was used tp estimate peak stormwater runoff and to verfiy the routing of the stormwater through the existing sedimentation ponds with the expansion of the new stockpile area. The SCS method was used within the HEC-HMS model to estimate peak runoff from the watershed for both the 10-year and 25-year 24 hour storms. Printouts of data inputs and hydrologic calculations for watersheds expected to be impacted by mining to and associated activities are included in Section 7 of the application.

C. Expected drainage patterns, during mining and after reclamation, including location of discharge point:

Expected drainage patterns for the next five years are shown in light blue on Map 3. Quarry life would be expected to exceed 20 years, therefore final drainage patterns after reclamation are impossible to determine with absolute certainty at this time, however, potential final drainage patterns are shown with green arrows and the letter "R". Discharge Monitoring Point (DMP) 001 is shown at the point where a red triangle touches Davis Branch. Only watersheds C, E, and F are affected or expected to be affected by mining and associated activities (pit development, overburden storage, processing plant, and product stockpiles) in the next five years. Watershed characteristics follow in Table 1.

Watershed "A"

Watershed A consists of 5.4 acres and is located south of Watershed B being bounded to the west by the unnamed tributary of Davis Branch and the western property boundary and to the south by Judge Ben Allen Road. It is comprised mainly of the paved access road and adjoining slopes and undisturbed wooded areas. Water in the area flows to a sedimentation basin adjacent to the junction of the access road with Judge Ben Allen Road. This basin collects the majority of stormwater that flows from the access road and adjacent slopes. Water on the west side of Watershed A sheet flows to the unnamed tributary of Davis Branch. No mining or processing activity currently takes place in Watershed A. Maintenance and stabilization activity of roadway slopes occurs as necessary and annual stormwater sampling of the basin discharge (SW-001) if a discharge occurs.

Watershed "B"

Watershed B is bounded on the west by the unnamed tributary to Davis Branch and the western property line, to the south is Watershed A, and to the east Watershed G and the entrance road. The watershed is a vegetated (wooded) buffer zone between the active area and unnamed tributary to Davis Branch. The total area of the watershed is 8.7 acres. No development is expected to occur within it in the foreseeable future. Water within Watershed B sheet flows to the unnamed tributary of Davis Branch and channelizes before crossing under Judge Ben Allen Road flowing through two properties and then back under the road and into Davis Branch downstream from the quarry entrance Located on Judge Ben Allen Road . No mining or processing activity is currently taking place in Watershed A. Maintenance and stabilization activity of roadway slopes occur as necessary.

Watershed "C"

Watershed C encompasses the center of the permitted area. It contains about 24.6 acres including areas of overburden placement shown on the Map 2/Map 3 and the new stockpile area. Watershed C has an estimated 18 acres of currently affected permitted area and approximately 6.6 acres of woodlands. Runoff from Watershed C is intercepted by the haul road drainage channel and berms diverting water away from Davis Branch and its unnamed tributary and routing it to the main settling pond (Pond P1). The discharge monitoring point (DMP001) for the main settling pond is within this watershed and shown on Maps 2 and 3. The point discharges to Davis Branch adjacent to the property line.

Watershed "D"

Watershed D immediately west of the active pit, processing, and storage areas and contains about 12 acres.. The area is forested and undisturbed. Runoff from Watershed D flows overland to the west toward the unnamed tributary to Davis Branch. A 25-foot buffer is maintained between the tributary and watershed D for the length of the western boundary. Erosion controls and best management practices (BMP) will be utilized during construction of the diversion berm and new stockpile area within Watershed C located to the east. The BMPs will be maintained during the overburden placement and until diversion berms are in place, functioning, and stabilized. No development is expected to occur in this watershed in the foreseeable future.

Watershed "E"

Water shed E is the expanded quarry pit shown on Map 3. The watershed contains 17.8 acres and will be graded so that water surrounding the pit drains and is contained within the existing and/or expanded quarry pit. The pit will serve as Watershed E's affected area sediment pond.

Watershed "F"

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Watershed F is the area of the existing processing plant operations. It occurs east of Watershed C/D, south of Watershed C, and west of Davis Branch. The watershed contains 4.0 acres. Watershed F also contains the ponds, SB-1 and SB-2. SB-1 and SB-2 were expanded 40 feet and 30 feet, respectively. SB-1 and SB-2 have 18 inch corrugated metal standpipes and emergency spillways which direct overflow to main sedimentation pond (Pond 1).

Watershed "G"

Watershed G is the area west of Davis Branch and adjacent to the northern portion of the entrance road on. The watershed contains approximately 4.1 acres. Water flow in this watershed consists of stormwater in the entrance road and Davis Branch areas. These flows are sheet toward Davis Branch for the unaffected area and channelizes along the entrance roadside ditch to the sediment basin SWB-1 along Judge Ben Allen Road . No mining or processing activity is currently taking place in Watershed G. Maintenance and stabilization activity of roadway slopes continues as necessary.

D. Location, type, and size of any culverts which may be installed:

There are no plans for culvert installations in the next five years. Should additional culverts be necessary for water flow control, they will be sized consistent with good engineering practices. The culvert in the road between the scales and the plant is a 15", the culverts in the sediment basins are 18", and the culvert at DMP001 is a 24".

E. Descriptions of drain ways through disturbed areas, over highwalls, along benches, and across outslopes:

Stormwater movement currently occurs as sheet run-off, as flow in unconstructed swales, and roadside ditches. Water from the quarry pit is pumped out to a roadside ditch that leads to Pond P1. Water from the plant area is directed into the Sediment Basins (SB1 and SB2) and the Main Settling Pond (P1) through grading of the site, ditches, and pipes.

F. Descriptions of sediment control structures, including plans for construction, exact location, size, and capacity:

A schematic of water usage, distribution, and discharge points is shown in Section 4 on Drawing A. The air pollution dust suppression system used in the crushing and screening plant utilizes water spray technology. Water was pumped from the Main Settling Pond to the to the dust suppression system points in the plant. Water was applied at a rate such that almost all water is adsorbed onto the aggregate during crushing and screening. Excess dust suppression and wash-down water from the plant flows back to the pond. The plant has a sand screw for making washed sand. Discharge water from the sand screw goes to two settling ponds in series and then discharges from the downstream basin into Pond (P1). Water from Pond (P1) is used for make-up water at the sand screw.

1. Main Settling Pond (P1):

Pond (P1)is a pre-existing pond on the property about 1,500 feet north of the intersection of the access road with Judge Ben Allen Road. The pond has a surface area of approximately 18,975 ft^2 and is about 115 feet long, 165 feet wide, and a maximum of 14 feet deep. However, the pond is capable of additional storage within its bermed area and has the potential have a surface area of approximately 40,000 square feet before its berm is overtopped. Discharge from the pond is via a 24-inch corrugated metal pipe to Davis Branch. The base of this pipe is three feet below the rim of the dam.
The discharge end of the pipe is on leased property about four feet from the bank of Davis Creek and about 2 feet above creek level. Coarse stream gravel serves as the outlet's erosion protection. Some riprap was added to ensure the prevention of erosion from discharges of the outlet. The discharge end of this pipe is Discharge Monitoring Point 001. An emergency spillway was also constructed to prevent washout of the pond dam in case of an extraordinary storm event. This pond is shown in light blue on the Drainage Map- Map 3 and in the Details sheet.

2. Sand Screw/Plant Sediment Basins (SB1 & SB2):

Two settling ponds in series were built to handle fines generated by the sand screw. They are located on the east side of the property, southeast of the main plant. The ponds are upslope of the Main Settling Pond, and overflow by gravity to the Main Settling Pond. Surface area for SB-1 is approximately 4,000 ft^2; SB-2 is 3,600 ft^2 with a design initial depth of 15 feet. Settled fine material from each pond is sold or placed in the overburden dumps. A decant trap has been dug just upstream of SB1 to allow fine material from the basins to dry some before transporting.

3. Quarry Sump:

As the pit is developed the floor developed in order to have water collect in one corner of the pit. There is some percolation along fractures over time but there is time for settling. Excess water is pumped out and allowed to flow in roadsides ditches through various sediment traps eventually making its way to Pond P1.

4. Access Road Sediment Basin (SWB1):

The Access Road sediment basin is used to collect and settle sediment from stormwater run-off from the southern part of the access road and road embankments. The area of this basin is approximately 1200 ft^2, and it is about 6 feet deep. This sediment basin is shown in light blue on Map 3 at the intersection of the entrance road and Judge Ben Allen Road.

5. Best Management Practices - Temporary Siltation Control Measures:

Silt fence, waddles, and constructed earthen berms are used as temporary methods of sedimentation control during access road bank stabilization and placement of overburden for new stockpile areas (See #1-3 on Drainage Map – Map 3). They will also be used where any ground disturbing work may create a potential for contaminated stormwater to flow off site until permanent control measures are established. These measures will be in place until a final vegetative cover is established. A general design drawing is given in Details in Section 7.

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G. Expected drainage control measures along haul roads to include design and calculation of ditches:

At the present, there are no designed ditches along the quarry haul or access roads. Within the present areas water flows by sheet run-off to the haul roads, and from there to the Main Settling Pond (P1). No ditches were engineered in the plant or stockpile areas. Plans for quarrying and upgrading pit access roads call for the roads to be sloped gently towards the highwall along the road with an earth berm on the outside part of the road. Stormwater will flow in the swale thus created and will be directed to the Main Settling Pond. The outside of the berms will be sown with grass as soon as they are completed. Appropriates BMPs will be used downslope of the berms until vegetation is established. Additional ditching and possible culverts have not been designed at this time. No new formal ditches or culverts are planned at this time for the crushing and screening plant area, in part because of the constantly changing of the shape and placement of stockpiles. The ground is to be graded and sloped, however, to carry contaminated water to the Main Settling Pond (P1).

H. Location of diversion ditches (temporary or permanent); design and calculation used in designing the ditches:

None formally planned at this time.

TABLE 1
ELIZABETHTON QUARRY - WATERSHEDS IN SUMMARY

WATERSHED DESIGNATOR	ACRES TO BE AFFECTED BY MINING ACTIVITY IN NEXT 5 YEARS	ACRES IN AFFECTED ("PERMITTED") AREA	TOTAL AREA (acres)	Runoff Curve Number (CN)	Time of Concentration Tc (min) After Devel.
A	0	5.4	5.4	70	<10 min
B	0	8.7	8.7	70	<10 min
C	18.6	6	24.6	83	<10 min
D	0	12	12	70	<10 min
E	17.8	17.8	17.2	87	<10 min
F	4	4	4	87	<10 min
G	0	4.1	4.1	70	<10 min

NOTE: (a) Data is for developed watershed at the end of the next five years.
(b) Weighted Curve Number is 79..

SEDIMENT CONTROL STRUCTURES

The Drainage Map (Map 3) submitted with this document shows the location of the main settling pond (P1), sand screw settling ponds (SB1 & SB2), and the access road sediment basin (SWB1), which are used to treat surface water runoff from disturbed areas. The watershed analysis and sedimentation control structure design information submitted with this document is based on a ten-year, 24-hour storm event. The existing 18" and 24" CMPs and overflow structures on Pond P1, SB-1, and SB-2 are able to convey the flows from the ponds for the 25 year – 24 hour storm. Printouts of data inputs and hydrologic calculations for watersheds expected to be impacted by mining to and associated activities are included in Section 7.

Main Settling Pond (P1)

Watersheds C & F contribute water flow to the Main Settling Pond (P1). The flow include(s) excess process water from the crushing and screening plant, sand screw settling ponds, roadway dust suppression water, possible quarry pump out, and storm water run-off from the quarry and haul roads. Pond capacity and water handling data presented below is for rainfall amounts from a 24-hour storm based on ten-year frequency:

Rainfall	- 4.8 inches (10 year - 24 hour) and 5.4 inches (25 year – 24 hour)
Drainage area	- 24.6 acres (Watershed C) and 4.0 acres (Watershed F)
Hydrologic Groupings	- C
Runoff Curve Number (CN)	- 79
Slope	- Moderate/Steep to Flat
Land Use	- Woodlands, Quarry, Roads, Processing
Peak Discharge (Q)	- Watershed Area C - 118.8 ft^3/sec & Watershed Area F - 20.2 ft^3/sec

The volume of runoff from a 4.8 inch rainfall in the watersheds for sediment ponds based on the SCS hydrograph is 8.5 acre feet or 2.77 million gallons of water.

SURFACE AREA CALCULATION (Stokes Law Settling)

Stokes Law = $V_S = \frac{g}{18u}(S-1)D^2$

Where
u = Kinematic viscosity at 4°C
D = Particle diameter of 0.004 cm
S = Specific gravity = 2.6 for sandstone/limestone
g = Constant = 981

hence $V_S = \frac{981}{18(0.018)}(2.6-1)(0.004)^2$

V_S = 0.078 cm/sec. V_S = 0.078 cm/sec. x 0.0321 = 0.0026 ft./sec.

To determine the surface area needed for settling in the Main Settling Pond in accordance with Stokes Law Velocity, the continuity equation is used where:

$A = Q/V_S$ A = 57/0.0026 A = 21,923 ft^2

The total area for the basin is:

Basin surface area (design)	= 18,975 ft^2	Basin surface area (max)	= 40,000 ft^2
Average depth	= 14 ft.	Volume 10 Year	= 6.4 acre-ft., = 278,784 ft^3
Total volume	= 10.9 acre-ft.,	= 474,800 ft^3	

The potential storm water inflow from a 10-year, 24-hour storm into the Main Settling Pond is adequately stored by the pond's maximum capacity. The primary function of this pond is the settling out of very fine sediments from process waters from the plant (when present and operating), roads, and stockpile areas (when the plant is present and operating). Based on experience while operating, and the fact that there are two smaller intervening basins, and storage of water in the upper quarry pit, the pond appears to have sufficient capacity to handle up to a 10-year, 24-hour storm without discharging. The pond is designed to eventually overflow and discharge to Davis Branch. To date even heavy storms have not caused an overflow. Because the pond is not expected to discharge except during a 10-year, 24-hour storm or greater, this should not present a problem. Should water levels in the pond during normal use rise to a point that discharge would be expected, then either baffles, a floating silt curtain, or relocation of water inlets to the pond, or a combination of these methods could be used to ensure proper water quality standards are met. A secondary or emergency spillway is present in the pond rim on the eastern side of the pond near the discharge culvert. As built drawings of the Main Settling Pond (P1) are given in the 'Details' Drawing.

Sand Plant Basins (SB1 & SB2)

The Sand Screw Sediment Basins receive process water from the sand screw when the plant is active, as well as plant wash down and storm water. Pond capacity and water handling data presented below is for expected water discharge rates from the sand screw. They are arranged to discharge in series with final discharge into the Main Settling Pond (P1).

Pond SB-1 will be expanded to be 40' longer and SB-2 will be expanded to be 30' longer. The depth will remain unchanged. SB-1 will be approximately 100' x 40' wide and SB-2 will be approximately 90' long x 40' wide. An 18-inch corrugated metal standpipe conducts overflow from one pond to the next by gravity flow, with another 18-inch corrugated metal pipe directing final decant from the lower pond to the Main Settling Pond (P1). Depth at clean out is 15 feet below the overflow into the standpipes. The pond configurations are shown in 'Details' Drawing . Each of these ponds will normally hold about 43,560 ft^3 of water. Now and for the foreseeable future, these ponds will receive runoff from Watershed F and represent additional storage of runoff from Watershed C.

Entrance/Access Road Sediment Basin (SWB1)

A sediment basin/trap has been built at the junction of the entrance/access road with Judge Ben Allen Road. This basin receives storm water runoff from the embankments and ditches along the access road (Watershed A). This basin is stabilized as part of the ditch and check dam system to discharge water into ditches along Judge Ben Allen Road. Flow rates into the trap from a 24-hour storm based on ten-year frequency is expected to be:

Rainfall, 10 year-24 hour	- 4.8 inches
Drainage area	- 2.78 acres
Hydrologic Groupings	- D
Runoff Curve Number (CN)	- 94
Runoff depth in inches	- 4.1
Slope	- Moderate
Land Use	- Roadway
Peak Discharge (Q)	- $22 ft^2/sec$

The volume of runoff from a 4.8 inch rainfall in this watershed with a runoff depth of 4.1 inches would be:

2.78 acres x 4.1 inches = 11.4 acre-inches
11.4 acre-inches ÷ 12 = 0.95 acre-feet
11.4 acre-inches x 27,154 gallons/acre-inch = 309,556 gal. (approximate)

SURFACE AREA CALCULATION (Stokes Law Settling)

Stokes Law = $V_S = \frac{g}{18u}(S-1)D^2$

Where
u = Kinematic viscosity at 4°C
D = Particle diameter of 0.004 cm
S = Specific gravity = 2.6 for sandstone/limestone
g = Constant = 981

hence $V_S = \frac{981}{18(0.018)}(2.6-1)(0.004)^2$

V_S = 0.078 cm/sec. V_S = 0.078 cm/sec. x 0.0321 = 0.0026 ft./sec.

To determine the surface area needed for settling in the Quarry sump in accordance with Stokes Law Velocity, the continuity equation is used where:

$A = Q/V_S$ A = 22/0.0026 A = 8,462 ft^2

The total area for the expected sediment trap is:

Basin/Trap surface area	=	1,200 ft^2
Average depth	=	6 ft.
Total volume	=	7,200 ft^3
	=	53,860 gal.

While this trap would not hold a 10-year, 24-hour storm, it would provide filtration and slowing of water discharge rates. A schematic of this structure is shown in the Details in Section 7.

Quarry Pit Sump(s)

At this time, there are no formally developed sumps in the area quarried by Aggregates USA, LLC (AUSA). As AUSA develops the pit, depressed areas for use as sumps may gradually be developed. Water to these sumps is likely to be a combination of ground water and storm water. At present, water is pumped and/or flows over the surface from the pit to the Main Settling Pond (P1). With the expansion of the upper pit , plans call for water from the sump(s) to be pumped to Pond P1 as a source of make up water. Excess water would be discharged to Davis Branch through DMP001. Although no formal sump has been designed, there is a depressed area in the lower pit that holds some water. Flow rates into the lower pit from a 24-hour storm based on ten-year frequency would be:

Rainfall	- 4.8 inches
Drainage area	- 17.8 acres
Hydrologic Groupings	- C
Runoff Curve Number (CN)	- 87
Slope	- Moderate
Land Use	- Quarry
Peak Discharge (Q)	- 77 cu. ft./sec

The volume of runoff from a 4.8 inch rainfall in this watershed based on the SCS hydrograph is 5.4 acre feet or 1.76 million gallons of water:

SURFACE AREA CALCULATION (Stokes Law Settling)

Stokes Law = $V_S = \frac{g}{18u}(S-1)D^2$

Where u = Kinematic viscosity at 4°C
D = Particle diameter of 0.004 cm
S = Specific gravity = 2.6 for sandstone/limestone
g = Constant = 981

hence $V_S = \frac{981}{18(0.018)}(2.6-1)(0.004)^2$

V_S = 0.078 cm/sec. V_S = 0.078 cm/sec. x 0.0321 = 0.0026 ft./sec.

To determine the surface area needed for settling in the Quarry sump in accordance with Stokes Law Velocity, the continuity equation is used where:

$A = Q/V_S$ A = 32/0.0026 A = 12,307 ft²

The total area for the expected quarry sump is assumed to be:

Sump surface area = 40,000 ft², Average depth = 5 ft., Total volume = 240,000 ft.^{3}, = 1.76 million gal.

The stormwater inflow into the upper pit for a 10-year, 24-hour storm will be less than the quarry capacity (quarry floor area x quarry depth). These factors allow for sufficient time and capacity for settling and retention. The storage in the quarry pit lessens the flow to Pond P1 and aids in sediment control.

Project: AUSA 4.2 Simulation Run: 25 Storm

Start of Run: 25Oct1977, 00:00 Basin Model: Subbasin C
End of Run: 26Oct1977, 00:30 Meteorologic Model: 25 yr 24 hr
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-C	0.03840	118.8	25Oct1977, 12:00	3.64
Reach-1	0.03840	118.8	25Oct1977, 12:07	3.64
SB-1	0.00625	20.0	25Oct1977, 12:04	3.42
SB-2	0.00625	19.9	25Oct1977, 12:05	3.39
SB-3	0.04465	61.8	25Oct1977, 12:16	3.46
DMP to Davis Branch	0.04465	61.8	25Oct1977, 12:17	3.46
Subbasin-F	0.00625	20.2	25Oct1977, 11:58	3.44
Reach-2	0.00625	20.2	25Oct1977, 12:03	3.44

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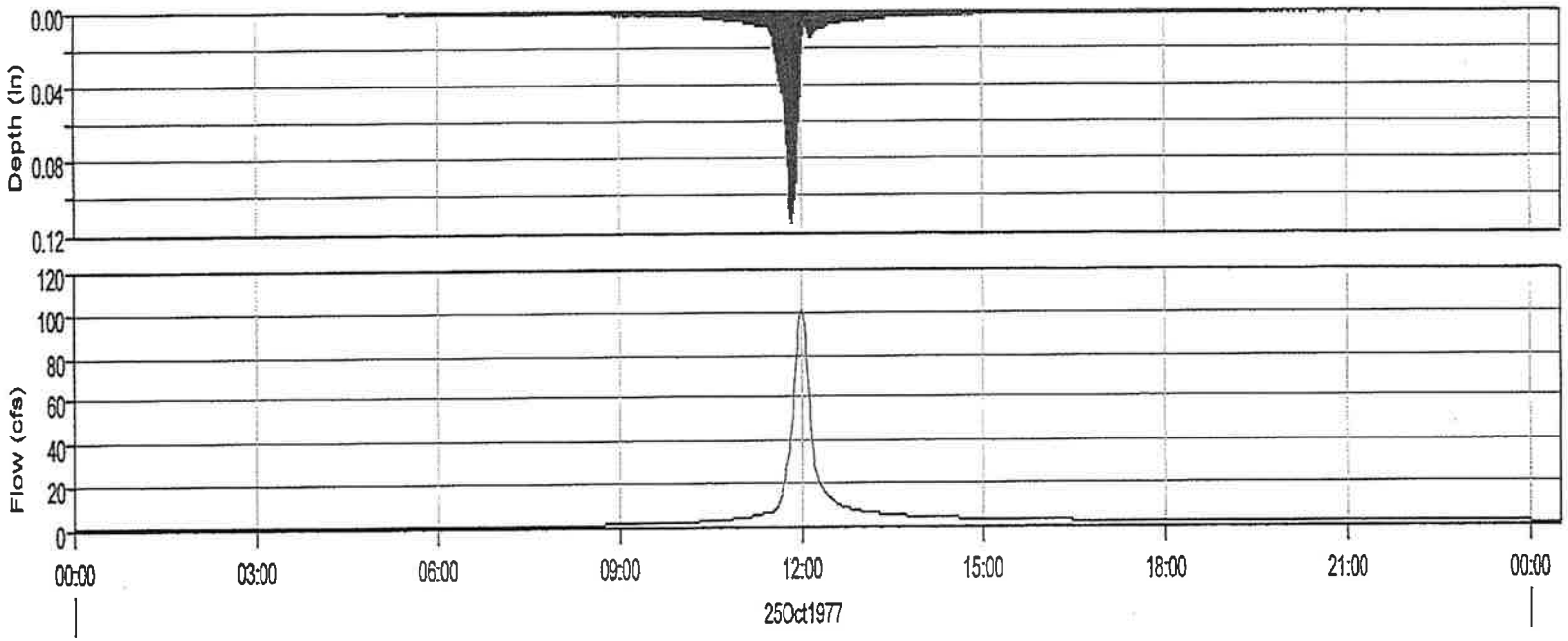
Project: AUSA 4.2 Simulation Run: 10 Storm

Start of Run: 25Oct1977, 00:00 Basin Model: Subbasin C
End of Run: 26Oct1977, 00:30 Meteorologic Model: 10yr 24 hour
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-C	0.03840	101.5	25Oct1977, 12:00	3.10
Reach-1	0.03840	101.5	25Oct1977, 12:07	3.10
SB-1	0.00625	16.9	25Oct1977, 12:04	2.89
SB-2	0.00625	16.8	25Oct1977, 12:05	2.87
SB-3	0.04465	52.4	25Oct1977, 12:16	2.94
DMP to Davis Branch	0.04465	52.4	25Oct1977, 12:17	2.94
Subbasin-F	0.00625	17.2	25Oct1977, 11:58	2.92
Reach-2	0.00625	17.2	25Oct1977, 12:03	2.92

Subbasin "Subbasin-C" Results for Run "10 Storm"



Run:10 Storm Element:Subbasin-C Result:Precipitation

Run:10 Storm Element:Subbasin-C Result:Precipitation Loss

Run:10 Storm Element:Subbasin-C Result:Outflow

Run:10 Storm Element:Subbasin-C Result:Baseflow

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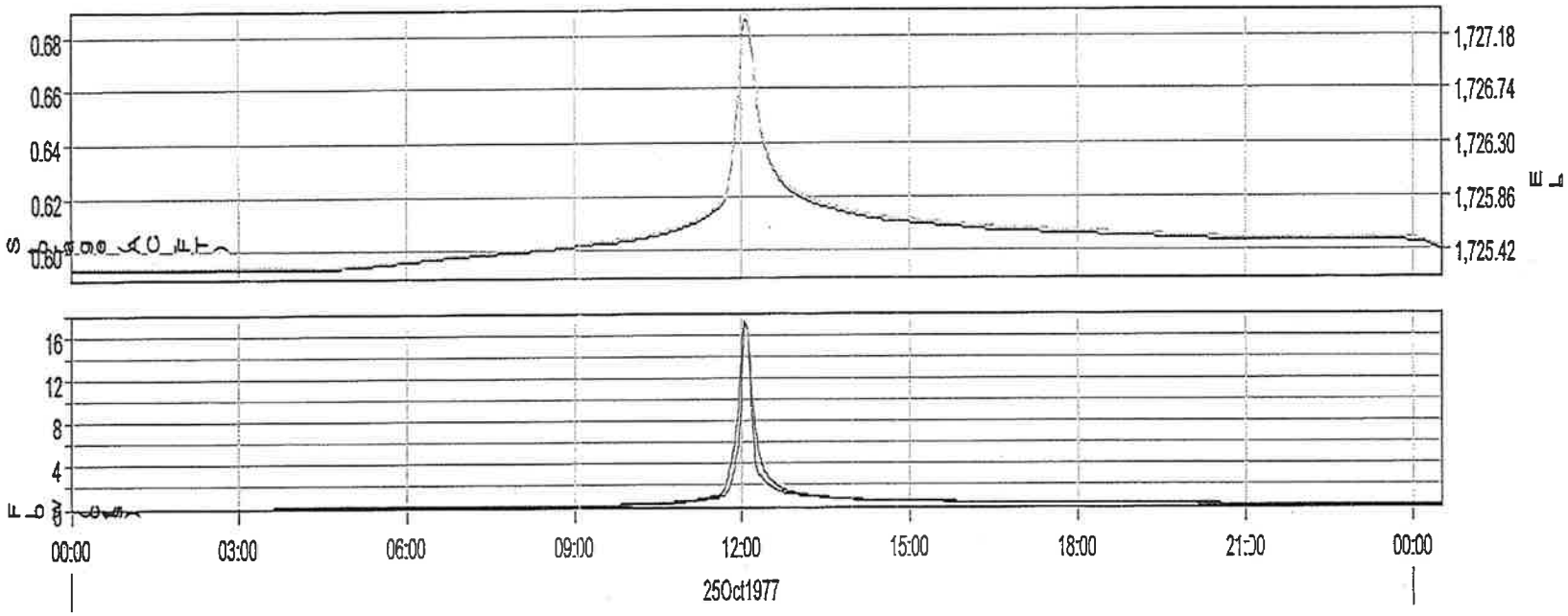
Reservoir "SB-1" Results for Run "10 Storm"



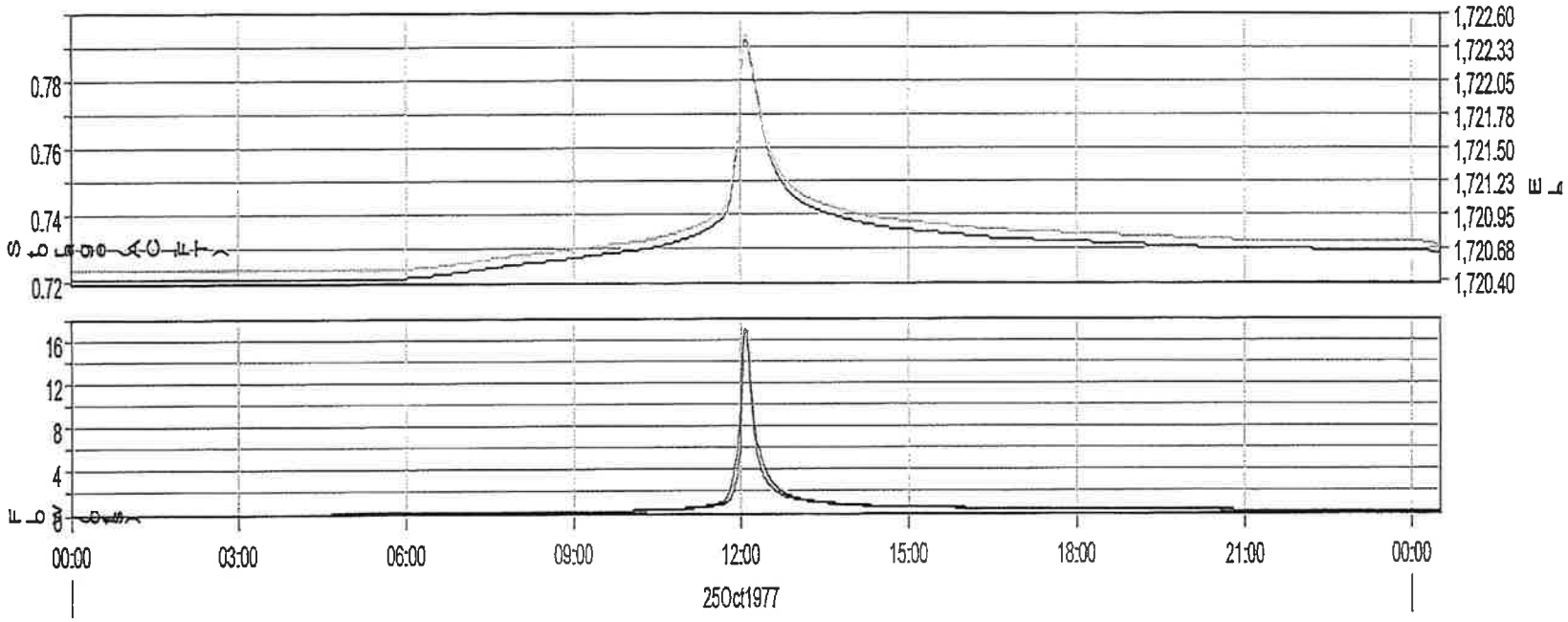
Run:10 Storm Element:SB-1 Result:Storage EXPIRED

Run:10 Storm Element:SB-1 Result:Pool Elevation EXPIRED

Run:10 Storm Element:SB-1 Result:Outflow EXPIRED

Run:10 Storm Element:SB-1 Result:Combined Inflow EXPIRED

Reservoir "SB-2" Results for Run "10 Storm"



Run:10 Storm Element:SB-2 Result:Storage EXPIRED

Run:10 Storm Element:SB-2 Result:Pool Elevation EXPIRED

Run:10 Storm Element:SB-2 Result:Outflow EXPIRED

Run:10 Storm Element:SB-2 Result:Combined Inflow EXPIRED

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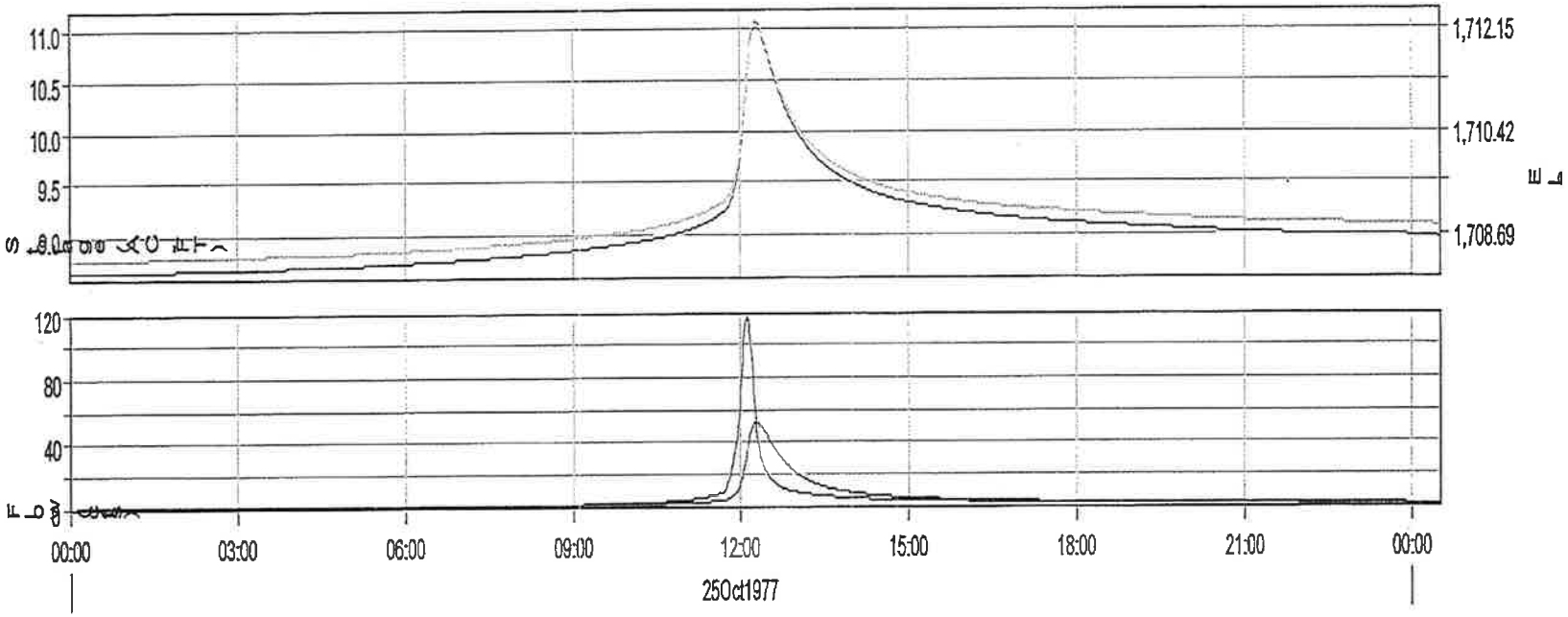
Reservoir "SB-3" Results for Run "10 Storm"



Run:10 Storm Element:SB-3 Result:Storage EXPIRED

Run:10 Storm Element:SB-3 Result:Pool Elevation EXPIRED

Run:10 Storm Element:SB-3 Result:Outflow EXPIRED

Run:10 Storm Element:SB-3 Result:Combined Inflow EXPIRED

Project: AUSA 4.2 Simulation Run: 10 Storm
Reservoir: SB-3

Start of Run: 25Oct1977, 00:00 Basin Model: Subbasin C
End of Run: 26Oct1977, 00:30 Meteorologic Model: 10yr 24 hour
Compute Time: DATA CHANGED, RECOMPUTE Control Specifications:Control 1

25Oct1977	00:00	0.0	8.7	1708.3	0.0
25Oct1977	00:01	0.0	8.7	1708.3	0.0
25Oct1977	00:02	0.0	8.7	1708.3	0.0
25Oct1977	00:03	0.0	8.7	1708.3	0.0
25Oct1977	00:04	0.0	8.7	1708.3	0.0
25Oct1977	00:05	0.0	8.7	1708.3	0.0
25Oct1977	00:06	0.0	8.7	1708.3	0.0
25Oct1977	00:07	0.0	8.7	1708.3	0.0
25Oct1977	00:08	0.0	8.7	1708.3	0.0
25Oct1977	00:09	0.0	8.7	1708.3	0.0
25Oct1977	00:10	0.0	8.7	1708.3	0.0
25Oct1977	00:11	0.0	8.7	1708.3	0.0
25Oct1977	00:12	0.0	8.7	1708.3	0.0
25Oct1977	00:13	0.0	8.7	1708.3	0.0
25Oct1977	00:14	0.0	8.7	1708.3	0.0
25Oct1977	00:15	0.1	8.7	1708.3	0.0

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25Oct1977	00:16	0.1	8.7	1708.3	0.0
25Oct1977	00:17	0.1	8.7	1708.3	0.0
25Oct1977	00:18	0.1	8.7	1708.3	0.0
25Oct1977	00:19	0.1	8.7	1708.3	0.0
25Oct1977	00:20	0.1	8.7	1708.3	0.0
25Oct1977	00:21	0.1	8.7	1708.3	0.0
25Oct1977	00:22	0.1	8.7	1708.3	0.0
25Oct1977	00:23	0.1	8.7	1708.3	0.0
25Oct1977	00:24	0.1	8.7	1708.3	0.0
25Oct1977	00:25	0.1	8.7	1708.3	0.0
25Oct1977	00:26	0.1	8.7	1708.3	0.0
25Oct1977	00:27	0.1	8.7	1708.3	0.0
25Oct1977	00:28	0.1	8.7	1708.3	0.0
25Oct1977	00:29	0.1	8.7	1708.3	0.0
25Oct1977	00:30	0.1	8.7	1708.3	0.0
25Oct1977	00:31	0.1	8.7	1708.3	0.0
25Oct1977	00:32	0.1	8.7	1708.3	0.0
25Oct1977	00:33	0.1	8.7	1708.3	0.0
25Oct1977	00:34	0.1	8.7	1708.3	0.0
25Oct1977	00:35	0.1	8.7	1708.3	0.0
25Oct1977	00:36	0.1	8.7	1708.3	0.0

25Oct1977	00:37	0.1	8.7	1708.3	0.0
25Oct1977	00:38	0.1	8.7	1708.3	0.0
25Oct1977	00:39	0.1	8.7	1708.3	0.0
25Oct1977	00:40	0.1	8.7	1708.3	0.0
25Oct1977	00:41	0.1	8.7	1708.3	0.0
25Oct1977	00:42	0.1	8.7	1708.3	0.0
25Oct1977	00:43	0.1	8.7	1708.3	0.0
25Oct1977	00:44	0.1	8.7	1708.3	0.0
25Oct1977	00:45	0.1	8.7	1708.3	0.0
25Oct1977	00:46	0.1	8.7	1708.3	0.0
25Oct1977	00:47	0.1	8.7	1708.3	0.0
25Oct1977	00:48	0.1	8.7	1708.3	0.0
25Oct1977	00:49	0.1	8.7	1708.3	0.0
25Oct1977	00:50	0.1	8.7	1708.3	0.0
25Oct1977	00:51	0.1	8.7	1708.3	0.0
25Oct1977	00:52	0.1	8.7	1708.3	0.0
25Oct1977	00:53	0.1	8.7	1708.3	0.0
25Oct1977	00:54	0.1	8.7	1708.3	0.0
25Oct1977	00:55	0.1	8.7	1708.3	0.0
25Oct1977	00:56	0.1	8.7	1708.3	0.0
25Oct1977	00:57	0.1	8.7	1708.3	0.0

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25Oct1977	00:58	0.1	8.7	1708.3	0.0
25Oct1977	00:59	0.1	8.7	1708.3	0.0
25Oct1977	01:00	0.1	8.7	1708.3	0.0
25Oct1977	01:01	0.1	8.7	1708.3	0.0
25Oct1977	01:02	0.1	8.7	1708.3	0.0
25Oct1977	01:03	0.1	8.7	1708.3	0.0
25Oct1977	01:04	0.1	8.7	1708.3	0.0
25Oct1977	01:05	0.1	8.7	1708.3	0.0
25Oct1977	01:06	0.1	8.7	1708.3	0.0
25Oct1977	01:07	0.1	8.7	1708.3	0.0
25Oct1977	01:08	0.1	8.7	1708.3	0.0
25Oct1977	01:09	0.1	8.7	1708.3	0.0
25Oct1977	01:10	0.1	8.7	1708.3	0.0
25Oct1977	01:11	0.1	8.7	1708.3	0.0
25Oct1977	01:12	0.1	8.7	1708.3	0.0
25Oct1977	01:13	0.1	8.7	1708.3	0.0
25Oct1977	01:14	0.1	8.7	1708.3	0.0
25Oct1977	01:15	0.1	8.7	1708.3	0.0
25Oct1977	01:16	0.1	8.7	1708.3	0.0
25Oct1977	01:17	0.1	8.7	1708.3	0.0
25Oct1977	01:18	0.1	8.7	1708.3	0.0

25Oct1977	01:19	0.1	8.7	1708.3	0.0
25Oct1977	01:20	0.1	8.7	1708.3	0.0
25Oct1977	01:21	0.1	8.7	1708.3	0.0
25Oct1977	01:22	0.1	8.7	1708.3	0.0
25Oct1977	01:23	0.1	8.7	1708.3	0.0
25Oct1977	01:24	0.1	8.7	1708.3	0.0
25Oct1977	01:25	0.1	8.7	1708.3	0.0
25Oct1977	01:26	0.1	8.7	1708.3	0.0
25Oct1977	01:27	0.1	8.7	1708.3	0.0
25Oct1977	01:28	0.1	8.7	1708.3	0.0
25Oct1977	01:29	0.1	8.7	1708.3	0.0
25Oct1977	01:30	0.1	8.7	1708.3	0.0
25Oct1977	01:31	0.1	8.7	1708.3	0.0
25Oct1977	01:32	0.1	8.7	1708.3	0.0
25Oct1977	01:33	0.1	8.7	1708.3	0.0
25Oct1977	01:34	0.1	8.7	1708.3	0.0
25Oct1977	01:35	0.1	8.7	1708.3	0.0
25Oct1977	01:36	0.1	8.7	1708.3	0.0
25Oct1977	01:37	0.1	8.7	1708.3	0.0
25Oct1977	01:38	0.1	8.7	1708.3	0.0
25Oct1977	01:39	0.1	8.7	1708.3	0.0

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25Oct1977	01:40	0.1	8.7	1708.3	0.0
25Oct1977	01:41	0.1	8.7	1708.3	0.0
25Oct1977	01:42	0.1	8.7	1708.3	0.0
25Oct1977	01:43	0.1	8.7	1708.3	0.0
25Oct1977	01:44	0.1	8.7	1708.3	0.0
25Oct1977	01:45	0.1	8.7	1708.3	0.0
25Oct1977	01:46	0.1	8.7	1708.3	0.0
25Oct1977	01:47	0.1	8.7	1708.3	0.0
25Oct1977	01:48	0.1	8.7	1708.3	0.0
25Oct1977	01:49	0.1	8.7	1708.3	0.0
25Oct1977	01:50	0.1	8.7	1708.3	0.0
25Oct1977	01:51	0.1	8.7	1708.3	0.0
25Oct1977	01:52	0.1	8.7	1708.3	0.0
25Oct1977	01:53	0.1	8.7	1708.3	0.0
25Oct1977	01:54	0.1	8.7	1708.3	0.0
25Oct1977	01:55	0.1	8.7	1708.3	0.0
25Oct1977	01:56	0.1	8.7	1708.3	0.0
25Oct1977	01:57	0.1	8.7	1708.3	0.0
25Oct1977	01:58	0.1	8.7	1708.3	0.0
25Oct1977	01:59	0.1	8.7	1708.3	0.0
25Oct1977	02:00	0.1	8.7	1708.3	0.0

25Oct1977	02:01	0.1	8.7	1708.3	0.0
25Oct1977	02:02	0.1	8.7	1708.3	0.0
25Oct1977	02:03	0.1	8.7	1708.3	0.0
25Oct1977	02:04	0.1	8.7	1708.3	0.0
25Oct1977	02:05	0.1	8.7	1708.3	0.0
25Oct1977	02:06	0.1	8.7	1708.3	0.0
25Oct1977	02:07	0.1	8.7	1708.3	0.0
25Oct1977	02:08	0.1	8.7	1708.3	0.0
25Oct1977	02:09	0.1	8.7	1708.3	0.0
25Oct1977	02:10	0.1	8.7	1708.3	0.0
25Oct1977	02:11	0.1	8.7	1708.3	0.0
25Oct1977	02:12	0.1	8.7	1708.3	0.0
25Oct1977	02:13	0.1	8.7	1708.3	0.0
25Oct1977	02:14	0.1	8.7	1708.3	0.0
25Oct1977	02:15	0.1	8.7	1708.3	0.0
25Oct1977	02:16	0.1	8.7	1708.3	0.0
25Oct1977	02:17	0.1	8.7	1708.3	0.0
25Oct1977	02:18	0.1	8.7	1708.3	0.0
25Oct1977	02:19	0.1	8.7	1708.3	0.0
25Oct1977	02:20	0.1	8.7	1708.3	0.0
25Oct1977	02:21	0.1	8.7	1708.3	0.0

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25Oct1977	02:22	0.1	8.7	1708.3	0.0
25Oct1977	02:23	0.1	8.7	1708.3	0.0
25Oct1977	02:24	0.1	8.7	1708.3	0.0
25Oct1977	02:25	0.1	8.7	1708.3	0.0
25Oct1977	02:26	0.1	8.7	1708.3	0.0
25Oct1977	02:27	0.1	8.7	1708.3	0.0
25Oct1977	02:28	0.1	8.7	1708.3	0.0
25Oct1977	02:29	0.2	8.7	1708.3	0.0
25Oct1977	02:30	0.2	8.7	1708.3	0.0
25Oct1977	02:31	0.1	8.7	1708.3	0.0
25Oct1977	02:32	0.1	8.7	1708.3	0.0
25Oct1977	02:33	0.1	8.7	1708.3	0.0
25Oct1977	02:34	0.1	8.7	1708.3	0.0
25Oct1977	02:35	0.1	8.7	1708.3	0.0
25Oct1977	02:36	0.1	8.7	1708.3	0.0
25Oct1977	02:37	0.1	8.7	1708.3	0.0
25Oct1977	02:38	0.1	8.7	1708.3	0.0
25Oct1977	02:39	0.1	8.7	1708.3	0.0
25Oct1977	02:40	0.1	8.7	1708.3	0.0
25Oct1977	02:41	0.1	8.7	1708.3	0.0
25Oct1977	02:42	0.1	8.7	1708.3	0.0

25Oct1977	02:43	0.1	8.7	1708.3	0.0
25Oct1977	02:44	0.1	8.7	1708.3	0.0
25Oct1977	02:45	0.1	8.7	1708.3	0.0
25Oct1977	02:46	0.1	8.7	1708.3	0.0
25Oct1977	02:47	0.1	8.7	1708.3	0.0
25Oct1977	02:48	0.1	8.7	1708.3	0.0
25Oct1977	02:49	0.1	8.7	1708.3	0.0
25Oct1977	02:50	0.1	8.7	1708.3	0.0
25Oct1977	02:51	0.1	8.7	1708.3	0.0
25Oct1977	02:52	0.1	8.7	1708.3	0.0
25Oct1977	02:53	0.1	8.7	1708.3	0.0
25Oct1977	02:54	0.1	8.7	1708.3	0.0
25Oct1977	02:55	0.1	8.7	1708.3	0.0
25Oct1977	02:56	0.1	8.7	1708.3	0.0
25Oct1977	02:57	0.1	8.7	1708.3	0.0
25Oct1977	02:58	0.2	8.7	1708.3	0.0
25Oct1977	02:59	0.2	8.7	1708.3	0.0
25Oct1977	03:00	0.2	8.7	1708.3	0.0
25Oct1977	03:01	0.2	8.7	1708.3	0.0
25Oct1977	03:02	0.2	8.7	1708.3	0.0
25Oct1977	03:03	0.2	8.7	1708.3	0.0

DEC 2 8 2016

25Oct1977	03:04	0.2	8.7	1708.3	0.0
25Oct1977	03:05	0.2	8.7	1708.4	0.0
25Oct1977	03:06	0.2	8.7	1708.4	0.0
25Oct1977	03:07	0.2	8.7	1708.4	0.0
25Oct1977	03:08	0.2	8.7	1708.4	0.0
25Oct1977	03:09	0.2	8.7	1708.4	0.0
25Oct1977	03:10	0.2	8.7	1708.4	0.0
25Oct1977	03:11	0.2	8.7	1708.4	0.0
25Oct1977	03:12	0.2	8.7	1708.4	0.0
25Oct1977	03:13	0.2	8.7	1708.4	0.0
25Oct1977	03:14	0.2	8.7	1708.4	0.0
25Oct1977	03:15	0.2	8.7	1708.4	0.0
25Oct1977	03:16	0.2	8.7	1708.4	0.0
25Oct1977	03:17	0.2	8.7	1708.4	0.0
25Oct1977	03:18	0.2	8.7	1708.4	0.0
25Oct1977	03:19	0.2	8.7	1708.4	0.0
25Oct1977	03:20	0.2	8.7	1708.4	0.0
25Oct1977	03:21	0.2	8.7	1708.4	0.0
25Oct1977	03:22	0.2	8.7	1708.4	0.0
25Oct1977	03:23	0.2	8.7	1708.4	0.0
25Oct1977	03:24	0.2	8.7	1708.4	0.0

25Oct1977	03:25	0.2	8.7	1708.4	0.0
25Oct1977	03:26	0.2	8.7	1708.4	0.0
25Oct1977	03:27	0.2	8.7	1708.4	0.0
25Oct1977	03:28	0.2	8.7	1708.4	0.0
25Oct1977	03:29	0.2	8.7	1708.4	0.0
25Oct1977	03:30	0.2	8.7	1708.4	0.0
25Oct1977	03:31	0.2	8.7	1708.4	0.0
25Oct1977	03:32	0.2	8.7	1708.4	0.0
25Oct1977	03:33	0.2	8.7	1708.4	0.0
25Oct1977	03:34	0.2	8.7	1708.4	0.0
25Oct1977	03:35	0.2	8.7	1708.4	0.0
25Oct1977	03:36	0.2	8.7	1708.4	0.0
25Oct1977	03:37	0.2	8.7	1708.4	0.0
25Oct1977	03:38	0.2	8.7	1708.4	0.0
25Oct1977	03:39	0.2	8.7	1708.4	0.0
25Oct1977	03:40	0.2	8.7	1708.4	0.0
25Oct1977	03:41	0.2	8.7	1708.4	0.0
25Oct1977	03:42	0.2	8.7	1708.4	0.0
25Oct1977	03:43	0.2	8.7	1708.4	0.0
25Oct1977	03:44	0.2	8.7	1708.4	0.0
25Oct1977	03:45	0.2	8.7	1708.4	0.0

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25Oct1977	03:46	0.2	8.7	1708.4	0.0
25Oct1977	03:47	0.2	8.7	1708.4	0.0
25Oct1977	03:48	0.2	8.7	1708.4	0.0
25Oct1977	03:49	0.2	8.7	1708.4	0.0
25Oct1977	03:50	0.2	8.7	1708.4	0.0
25Oct1977	03:51	0.2	8.7	1708.4	0.0
25Oct1977	03:52	0.2	8.7	1708.4	0.0
25Oct1977	03:53	0.2	8.7	1708.4	0.0
25Oct1977	03:54	0.2	8.7	1708.4	0.0
25Oct1977	03:55	0.2	8.7	1708.4	0.0
25Oct1977	03:56	0.2	8.7	1708.4	0.0
25Oct1977	03:57	0.2	8.7	1708.4	0.0
25Oct1977	03:58	0.2	8.7	1708.4	0.0
25Oct1977	03:59	0.2	8.7	1708.4	0.0
25Oct1977	04:00	0.2	8.7	1708.4	0.0
25Oct1977	04:01	0.2	8.7	1708.4	0.0
25Oct1977	04:02	0.2	8.7	1708.4	0.0
25Oct1977	04:03	0.2	8.7	1708.4	0.0
25Oct1977	04:04	0.2	8.7	1708.4	0.0
25Oct1977	04:05	0.2	8.7	1708.4	0.0
25Oct1977	04:06	0.2	8.7	1708.4	0.0

25Oct1977	04:07	0.2	8.7	1708.4	0.0
25Oct1977	04:08	0.2	8.7	1708.4	0.0
25Oct1977	04:09	0.2	8.7	1708.4	0.0
25Oct1977	04:10	0.2	8.7	1708.4	0.0
25Oct1977	04:11	0.2	8.7	1708.4	0.0
25Oct1977	04:12	0.2	8.7	1708.4	0.0
25Oct1977	04:13	0.2	8.7	1708.4	0.0
25Oct1977	04:14	0.2	8.7	1708.4	0.0
25Oct1977	04:15	0.2	8.7	1708.4	0.0
25Oct1977	04:16	0.2	8.7	1708.4	0.0
25Oct1977	04:17	0.2	8.7	1708.4	0.0
25Oct1977	04:18	0.2	8.7	1708.4	0.0
25Oct1977	04:19	0.2	8.7	1708.4	0.0
25Oct1977	04:20	0.2	8.7	1708.4	0.0
25Oct1977	04:21	0.2	8.7	1708.4	0.0
25Oct1977	04:22	0.2	8.7	1708.4	0.0
25Oct1977	04:23	0.2	8.7	1708.4	0.0
25Oct1977	04:24	0.2	8.7	1708.4	0.0
25Oct1977	04:25	0.2	8.7	1708.4	0.0
25Oct1977	04:26	0.2	8.7	1708.4	0.0
25Oct1977	04:27	0.2	8.7	1708.4	0.0

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25Oct1977	04:28	0.2	8.7	1708.4	0.0
25Oct1977	04:29	0.2	8.7	1708.4	0.0
25Oct1977	04:30	0.2	8.7	1708.4	0.0
25Oct1977	04:31	0.2	8.7	1708.4	0.0
25Oct1977	04:32	0.2	8.7	1708.4	0.0
25Oct1977	04:33	0.2	8.7	1708.4	0.0
25Oct1977	04:34	0.2	8.7	1708.4	0.0
25Oct1977	04:35	0.2	8.7	1708.4	0.0
25Oct1977	04:36	0.2	8.7	1708.4	0.0
25Oct1977	04:37	0.2	8.7	1708.4	0.0
25Oct1977	04:38	0.2	8.7	1708.4	0.0
25Oct1977	04:39	0.2	8.7	1708.4	0.0
25Oct1977	04:40	0.2	8.7	1708.4	0.0
25Oct1977	04:41	0.2	8.7	1708.4	0.0
25Oct1977	04:42	0.2	8.7	1708.4	0.0
25Oct1977	04:43	0.3	8.7	1708.4	0.0
25Oct1977	04:44	0.3	8.7	1708.4	0.0
25Oct1977	04:45	0.3	8.7	1708.4	0.0
25Oct1977	04:46	0.3	8.7	1708.4	0.0
25Oct1977	04:47	0.3	8.7	1708.4	0.0
25Oct1977	04:48	0.3	8.7	1708.4	0.0

25Oct1977	04:49	0.3	8.7	1708.4	0.0
25Oct1977	04:50	0.3	8.7	1708.4	0.0
25Oct1977	04:51	0.3	8.7	1708.4	0.0
25Oct1977	04:52	0.3	8.7	1708.4	0.0
25Oct1977	04:53	0.3	8.7	1708.4	0.0
25Oct1977	04:54	0.3	8.7	1708.4	0.0
25Oct1977	04:55	0.3	8.7	1708.4	0.0
25Oct1977	04:56	0.3	8.7	1708.4	0.0
25Oct1977	04:57	0.3	8.7	1708.4	0.0
25Oct1977	04:58	0.3	8.7	1708.4	0.0
25Oct1977	04:59	0.3	8.7	1708.4	0.0
25Oct1977	05:00	0.3	8.7	1708.4	0.0
25Oct1977	05:01	0.3	8.7	1708.4	0.0
25Oct1977	05:02	0.3	8.7	1708.4	0.0
25Oct1977	05:03	0.3	8.7	1708.4	0.0
25Oct1977	05:04	0.3	8.7	1708.4	0.0
25Oct1977	05:05	0.3	8.7	1708.4	0.0
25Oct1977	05:06	0.3	8.7	1708.4	0.0
25Oct1977	05:07	0.3	8.7	1708.4	0.0
25Oct1977	05:08	0.3	8.7	1708.4	0.0
25Oct1977	05:09	0.3	8.7	1708.4	0.0

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25Oct1977	05:10	0.3	8.7	1708.4	0.0
25Oct1977	05:11	0.3	8.7	1708.4	0.0
25Oct1977	05:12	0.3	8.7	1708.4	0.0
25Oct1977	05:13	0.3	8.7	1708.4	0.0
25Oct1977	05:14	0.3	8.7	1708.4	0.0
25Oct1977	05:15	0.3	8.7	1708.4	0.0
25Oct1977	05:16	0.3	8.7	1708.4	0.1
25Oct1977	05:17	0.3	8.7	1708.4	0.1
25Oct1977	05:18	0.3	8.7	1708.4	0.1
25Oct1977	05:19	0.3	8.7	1708.4	0.1
25Oct1977	05:20	0.3	8.7	1708.4	0.1
25Oct1977	05:21	0.3	8.7	1708.4	0.1
25Oct1977	05:22	0.3	8.7	1708.4	0.1
25Oct1977	05:23	0.3	8.7	1708.4	0.1
25Oct1977	05:24	0.3	8.7	1708.4	0.1
25Oct1977	05:25	0.3	8.7	1708.4	0.1
25Oct1977	05:26	0.3	8.7	1708.4	0.1
25Oct1977	05:27	0.3	8.7	1708.4	0.1
25Oct1977	05:28	0.3	8.7	1708.4	0.1
25Oct1977	05:29	0.3	8.7	1708.4	0.1
25Oct1977	05:30	0.4	8.7	1708.4	0.1

25Oct1977	05:31	0.4	8.7	1708.4	0.1
25Oct1977	05:32	0.4	8.7	1708.4	0.1
25Oct1977	05:33	0.4	8.7	1708.4	0.1
25Oct1977	05:34	0.4	8.7	1708.4	0.1
25Oct1977	05:35	0.4	8.7	1708.4	0.1
25Oct1977	05:36	0.4	8.7	1708.4	0.1
25Oct1977	05:37	0.4	8.7	1708.4	0.1
25Oct1977	05:38	0.4	8.7	1708.4	0.1
25Oct1977	05:39	0.4	8.7	1708.4	0.1
25Oct1977	05:40	0.4	8.7	1708.4	0.1
25Oct1977	05:41	0.4	8.7	1708.4	0.1
25Oct1977	05:42	0.4	8.7	1708.4	0.1
25Oct1977	05:43	0.4	8.7	1708.4	0.1
25Oct1977	05:44	0.4	8.7	1708.4	0.1
25Oct1977	05:45	0.4	8.7	1708.4	0.1
25Oct1977	05:46	0.4	8.7	1708.4	0.1
25Oct1977	05:47	0.4	8.7	1708.4	0.1
25Oct1977	05:48	0.4	8.7	1708.4	0.1
25Oct1977	05:49	0.4	8.7	1708.4	0.1
25Oct1977	05:50	0.4	8.7	1708.4	0.1
25Oct1977	05:51	0.4	8.7	1708.4	0.1

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25Oct1977	05:52	0.4	8.7	1708.4	0.1
25Oct1977	05:53	0.4	8.7	1708.4	0.1
25Oct1977	05:54	0.4	8.7	1708.4	0.1
25Oct1977	05:55	0.4	8.7	1708.4	0.1
25Oct1977	05:56	0.4	8.7	1708.4	0.1
25Oct1977	05:57	0.4	8.7	1708.4	0.1
25Oct1977	05:58	0.4	8.7	1708.4	0.1
25Oct1977	05:59	0.4	8.7	1708.4	0.1
25Oct1977	06:00	0.4	8.7	1708.4	0.1
25Oct1977	06:01	0.4	8.7	1708.4	0.1
25Oct1977	06:02	0.4	8.7	1708.4	0.1
25Oct1977	06:03	0.4	8.7	1708.4	0.1
25Oct1977	06:04	0.4	8.7	1708.4	0.1
25Oct1977	06:05	0.4	8.7	1708.4	0.1
25Oct1977	06:06	0.4	8.7	1708.4	0.1
25Oct1977	06:07	0.4	8.7	1708.4	0.1
25Oct1977	06:08	0.4	8.7	1708.4	0.1
25Oct1977	06:09	0.4	8.7	1708.4	0.1
25Oct1977	06:10	0.4	8.7	1708.4	0.1
25Oct1977	06:11	0.4	8.7	1708.4	0.1
25Oct1977	06:12	0.4	8.7	1708.4	0.1

25Oct1977	06:13	0.4	8.7	1708.4	0.1
25Oct1977	06:14	0.5	8.7	1708.4	0.1
25Oct1977	06:15	0.5	8.7	1708.4	0.1
25Oct1977	06:16	0.5	8.7	1708.4	0.1
25Oct1977	06:17	0.5	8.7	1708.4	0.1
25Oct1977	06:18	0.5	8.7	1708.4	0.1
25Oct1977	06:19	0.5	8.7	1708.4	0.1
25Oct1977	06:20	0.5	8.7	1708.4	0.1
25Oct1977	06:21	0.5	8.7	1708.5	0.1
25Oct1977	06:22	0.5	8.7	1708.5	0.1
25Oct1977	06:23	0.5	8.7	1708.5	0.1
25Oct1977	06:24	0.5	8.7	1708.5	0.1
25Oct1977	06:25	0.5	8.7	1708.5	0.1
25Oct1977	06:26	0.5	8.7	1708.5	0.1
25Oct1977	06:27	0.5	8.7	1708.5	0.1
25Oct1977	06:28	0.5	8.7	1708.5	0.1
25Oct1977	06:29	0.5	8.7	1708.5	0.1
25Oct1977	06:30	0.5	8.7	1708.5	0.1
25Oct1977	06:31	0.5	8.7	1708.5	0.1
25Oct1977	06:32	0.5	8.7	1708.5	0.1
25Oct1977	06:33	0.5	8.7	1708.5	0.1

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25Oct1977	06:34	0.5	8.8	1708.5	0.1
25Oct1977	06:35	0.5	8.8	1708.5	0.1
25Oct1977	06:36	0.5	8.8	1708.5	0.1
25Oct1977	06:37	0.5	8.8	1708.5	0.1
25Oct1977	06:38	0.5	8.8	1708.5	0.1
25Oct1977	06:39	0.5	8.8	1708.5	0.1
25Oct1977	06:40	0.5	8.8	1708.5	0.1
25Oct1977	06:41	0.5	8.8	1708.5	0.1
25Oct1977	06:42	0.5	8.8	1708.5	0.1
25Oct1977	06:43	0.5	8.8	1708.5	0.1
25Oct1977	06:44	0.5	8.8	1708.5	0.1
25Oct1977	06:45	0.5	8.8	1708.5	0.1
25Oct1977	06:46	0.5	8.8	1708.5	0.1
25Oct1977	06:47	0.6	8.8	1708.5	0.1
25Oct1977	06:48	0.6	8.8	1708.5	0.1
25Oct1977	06:49	0.6	8.8	1708.5	0.1
25Oct1977	06:50	0.6	8.8	1708.5	0.1
25Oct1977	06:51	0.6	8.8	1708.5	0.1
25Oct1977	06:52	0.6	8.8	1708.5	0.1
25Oct1977	06:53	0.6	8.8	1708.5	0.2
25Oct1977	06:54	0.6	8.8	1708.5	0.2

25Oct1977	06:55	0.6	8.8	1708.5	0.2
25Oct1977	06:56	0.6	8.8	1708.5	0.2
25Oct1977	06:57	0.6	8.8	1708.5	0.2
25Oct1977	06:58	0.6	8.8	1708.5	0.2
25Oct1977	06:59	0.6	8.8	1708.5	0.2
25Oct1977	07:00	0.6	8.8	1708.5	0.2
25Oct1977	07:01	0.6	8.8	1708.5	0.2
25Oct1977	07:02	0.6	8.8	1708.5	0.2
25Oct1977	07:03	0.6	8.8	1708.5	0.2
25Oct1977	07:04	0.6	8.8	1708.5	0.2
25Oct1977	07:05	0.6	8.8	1708.5	0.2
25Oct1977	07:06	0.6	8.8	1708.5	0.2
25Oct1977	07:07	0.6	8.8	1708.5	0.2
25Oct1977	07:08	0.6	8.8	1708.5	0.2
25Oct1977	07:09	0.6	8.8	1708.5	0.2
25Oct1977	07:10	0.6	8.8	1708.5	0.2
25Oct1977	07:11	0.6	8.8	1708.5	0.2
25Oct1977	07:12	0.6	8.8	1708.5	0.2
25Oct1977	07:13	0.6	8.8	1708.5	0.2
25Oct1977	07:14	0.6	8.8	1708.5	0.2
25Oct1977	07:15	0.6	8.8	1708.5	0.2

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25Oct1977	07:16	0.6	8.8	1708.5	0.2
25Oct1977	07:17	0.6	8.8	1708.5	0.2
25Oct1977	07:18	0.6	8.8	1708.5	0.2
25Oct1977	07:19	0.6	8.8	1708.5	0.2
25Oct1977	07:20	0.7	8.8	1708.5	0.2
25Oct1977	07:21	0.7	8.8	1708.5	0.2
25Oct1977	07:22	0.7	8.8	1708.5	0.2
25Oct1977	07:23	0.7	8.8	1708.5	0.2
25Oct1977	07:24	0.7	8.8	1708.5	0.2
25Oct1977	07:25	0.7	8.8	1708.5	0.2
25Oct1977	07:26	0.7	8.8	1708.5	0.2
25Oct1977	07:27	0.7	8.8	1708.5	0.2
25Oct1977	07:28	0.7	8.8	1708.5	0.2
25Oct1977	07:29	0.7	8.8	1708.5	0.2
25Oct1977	07:30	0.7	8.8	1708.5	0.2
25Oct1977	07:31	0.7	8.8	1708.5	0.2
25Oct1977	07:32	0.7	8.8	1708.5	0.2
25Oct1977	07:33	0.7	8.8	1708.5	0.2
25Oct1977	07:34	0.7	8.8	1708.5	0.2
25Oct1977	07:35	0.7	8.8	1708.5	0.2
25Oct1977	07:36	0.7	8.8	1708.5	0.2

25Oct1977	07:37	0.7	8.8	1708.5	0.2
25Oct1977	07:38	0.7	8.8	1708.5	0.2
25Oct1977	07:39	0.7	8.8	1708.5	0.2
25Oct1977	07:40	0.7	8.8	1708.5	0.2
25Oct1977	07:41	0.7	8.8	1708.5	0.2
25Oct1977	07:42	0.7	8.8	1708.5	0.2
25Oct1977	07:43	0.7	8.8	1708.5	0.3
25Oct1977	07:44	0.7	8.8	1708.5	0.3
25Oct1977	07:45	0.8	8.8	1708.5	0.3
25Oct1977	07:46	0.8	8.8	1708.5	0.3
25Oct1977	07:47	0.8	8.8	1708.5	0.3
25Oct1977	07:48	0.8	8.8	1708.5	0.3
25Oct1977	07:49	0.8	8.8	1708.5	0.3
25Oct1977	07:50	0.8	8.8	1708.5	0.3
25Oct1977	07:51	0.8	8.8	1708.5	0.3
25Oct1977	07:52	0.8	8.8	1708.5	0.3
25Oct1977	07:53	0.8	8.8	1708.5	0.3
25Oct1977	07:54	0.8	8.8	1708.5	0.3
25Oct1977	07:55	0.8	8.8	1708.5	0.3
25Oct1977	07:56	0.8	8.8	1708.5	0.3
25Oct1977	07:57	0.8	8.8	1708.5	0.3

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25Oct1977	07:58	0.8	8.8	1708.5	0.3
25Oct1977	07:59	0.8	8.8	1708.5	0.3
25Oct1977	08:00	0.8	8.8	1708.5	0.3
25Oct1977	08:01	0.8	8.8	1708.6	0.3
25Oct1977	08:02	0.8	8.8	1708.6	0.3
25Oct1977	08:03	0.8	8.8	1708.6	0.3
25Oct1977	08:04	0.8	8.8	1708.6	0.3
25Oct1977	08:05	0.8	8.8	1708.6	0.3
25Oct1977	08:06	0.8	8.8	1708.6	0.3
25Oct1977	08:07	0.8	8.8	1708.6	0.3
25Oct1977	08:08	0.8	8.8	1708.6	0.3
25Oct1977	08:09	0.8	8.8	1708.6	0.3
25Oct1977	08:10	0.9	8.8	1708.6	0.3
25Oct1977	08:11	0.9	8.8	1708.6	0.3
25Oct1977	08:12	0.9	8.8	1708.6	0.3
25Oct1977	08:13	0.9	8.8	1708.6	0.3
25Oct1977	08:14	0.9	8.8	1708.6	0.3
25Oct1977	08:15	0.9	8.8	1708.6	0.3
25Oct1977	08:16	0.9	8.8	1708.6	0.3
25Oct1977	08:17	0.9	8.8	1708.6	0.3
25Oct1977	08:18	0.9	8.8	1708.6	0.3

25Oct1977	08:19	0.9	8.8	1708.6	0.4
25Oct1977	08:20	0.9	8.8	1708.6	0.4
25Oct1977	08:21	0.9	8.8	1708.6	0.4
25Oct1977	08:22	0.9	8.8	1708.6	0.4
25Oct1977	08:23	0.9	8.8	1708.6	0.4
25Oct1977	08:24	1.0	8.8	1708.6	0.4
25Oct1977	08:25	1.0	8.8	1708.6	0.4
25Oct1977	08:26	1.0	8.8	1708.6	0.4
25Oct1977	08:27	1.0	8.8	1708.6	0.4
25Oct1977	08:28	1.0	8.8	1708.6	0.4
25Oct1977	08:29	1.0	8.8	1708.6	0.4
25Oct1977	08:30	1.0	8.8	1708.6	0.4
25Oct1977	08:31	1.0	8.8	1708.6	0.4
25Oct1977	08:32	1.0	8.8	1708.6	0.4
25Oct1977	08:33	1.0	8.8	1708.6	0.4
25Oct1977	08:34	1.0	8.8	1708.6	0.4
25Oct1977	08:35	1.1	8.8	1708.6	0.4
25Oct1977	08:36	1.1	8.8	1708.6	0.4
25Oct1977	08:37	1.1	8.8	1708.6	0.4
25Oct1977	08:38	1.1	8.8	1708.6	0.4
25Oct1977	08:39	1.1	8.8	1708.6	0.4

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25Oct1977	08:40	1.1	8.8	1708.6	0.4
25Oct1977	08:41	1.1	8.8	1708.6	0.4
25Oct1977	08:42	1.1	8.8	1708.6	0.4
25Oct1977	08:43	1.1	8.8	1708.6	0.4
25Oct1977	08:44	1.1	8.8	1708.6	0.4
25Oct1977	08:45	1.2	8.8	1708.6	0.5
25Oct1977	08:46	1.2	8.8	1708.6	0.5
25Oct1977	08:47	1.2	8.8	1708.6	0.5
25Oct1977	08:48	1.2	8.8	1708.6	0.5
25Oct1977	08:49	1.2	8.8	1708.6	0.5
25Oct1977	08:50	1.2	8.8	1708.6	0.5
25Oct1977	08:51	1.2	8.8	1708.6	0.5
25Oct1977	08:52	1.2	8.8	1708.6	0.5
25Oct1977	08:53	1.3	8.8	1708.6	0.5
25Oct1977	08:54	1.3	8.8	1708.6	0.5
25Oct1977	08:55	1.3	8.8	1708.6	0.5
25Oct1977	08:56	1.3	8.9	1708.6	0.5
25Oct1977	08:57	1.3	8.9	1708.6	0.5
25Oct1977	08:58	1.3	8.9	1708.6	0.5
25Oct1977	08:59	1.3	8.9	1708.6	0.5
25Oct1977	09:00	1.3	8.9	1708.6	0.5

25Oct1977	09:01	1.3	8.9	1708.6	0.5
25Oct1977	09:02	1.3	8.9	1708.6	0.5
25Oct1977	09:03	1.3	8.9	1708.6	0.5
25Oct1977	09:04	1.4	8.9	1708.6	0.6
25Oct1977	09:05	1.4	8.9	1708.6	0.6
25Oct1977	09:06	1.4	8.9	1708.6	0.6
25Oct1977	09:07	1.4	8.9	1708.6	0.6
25Oct1977	09:08	1.4	8.9	1708.6	0.6
25Oct1977	09:09	1.4	8.9	1708.7	0.6
25Oct1977	09:10	1.4	8.9	1708.7	0.6
25Oct1977	09:11	1.5	8.9	1708.7	0.6
25Oct1977	09:12	1.5	8.9	1708.7	0.6
25Oct1977	09:13	1.5	8.9	1708.7	0.6
25Oct1977	09:14	1.5	8.9	1708.7	0.6
25Oct1977	09:15	1.5	8.9	1708.7	0.6
25Oct1977	09:16	1.5	8.9	1708.7	0.6
25Oct1977	09:17	1.5	8.9	1708.7	0.6
25Oct1977	09:18	1.5	8.9	1708.7	0.6
25Oct1977	09:19	1.5	8.9	1708.7	0.6
25Oct1977	09:20	1.5	8.9	1708.7	0.7
25Oct1977	09:21	1.5	8.9	1708.7	0.7

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25Oct1977	09:22	1.5	8.9	1708.7	0.7
25Oct1977	09:23	1.5	8.9	1708.7	0.7
25Oct1977	09:24	1.6	8.9	1708.7	0.7
25Oct1977	09:25	1.6	8.9	1708.7	0.7
25Oct1977	09:26	1.6	8.9	1708.7	0.7
25Oct1977	09:27	1.6	8.9	1708.7	0.7
25Oct1977	09:28	1.6	8.9	1708.7	0.7
25Oct1977	09:29	1.6	8.9	1708.7	0.7
25Oct1977	09:30	1.6	8.9	1708.7	0.7
25Oct1977	09:31	1.6	8.9	1708.7	0.7
25Oct1977	09:32	1.6	8.9	1708.7	0.7
25Oct1977	09:33	1.6	8.9	1708.7	0.7
25Oct1977	09:34	1.6	8.9	1708.7	0.8
25Oct1977	09:35	1.6	8.9	1708.7	0.8
25Oct1977	09:36	1.6	8.9	1708.7	0.8
25Oct1977	09:37	1.6	8.9	1708.7	0.8
25Oct1977	09:38	1.6	8.9	1708.7	0.8
25Oct1977	09:39	1.6	8.9	1708.7	0.8
25Oct1977	09:40	1.6	8.9	1708.7	0.8
25Oct1977	09:41	1.6	8.9	1708.7	0.8
25Oct1977	09:42	1.6	8.9	1708.7	0.8

25Oct1977	09:43	1.7	8.9	1708.7	0.8
25Oct1977	09:44	1.7	8.9	1708.7	0.8
25Oct1977	09:45	1.7	8.9	1708.7	0.8
25Oct1977	09:46	1.7	8.9	1708.7	0.8
25Oct1977	09:47	1.7	8.9	1708.7	0.9
25Oct1977	09:48	1.7	8.9	1708.7	0.9
25Oct1977	09:49	1.7	8.9	1708.7	0.9
25Oct1977	09:50	1.7	8.9	1708.7	0.9
25Oct1977	09:51	1.8	8.9	1708.7	0.9
25Oct1977	09:52	1.8	8.9	1708.7	0.9
25Oct1977	09:53	1.8	8.9	1708.7	0.9
25Oct1977	09:54	1.8	8.9	1708.7	0.9
25Oct1977	09:55	1.8	8.9	1708.7	0.9
25Oct1977	09:56	1.8	8.9	1708.7	0.9
25Oct1977	09:57	1.9	8.9	1708.7	0.9
25Oct1977	09:58	1.9	8.9	1708.7	0.9
25Oct1977	09:59	1.9	8.9	1708.8	1.0
25Oct1977	10:00	1.9	8.9	1708.8	1.0
25Oct1977	10:01	1.9	8.9	1708.8	1.0
25Oct1977	10:02	2.0	8.9	1708.8	1.0
25Oct1977	10:03	2.0	8.9	1708.8	1.0

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25Oct1977	10:04	2.0	8.9	1708.8	1.0
25Oct1977	10:05	2.0	8.9	1708.8	1.0
25Oct1977	10:06	2.0	8.9	1708.8	1.0
25Oct1977	10:07	2.1	8.9	1708.8	1.0
25Oct1977	10:08	2.1	8.9	1708.8	1.0
25Oct1977	10:09	2.1	8.9	1708.8	1.0
25Oct1977	10:10	2.1	8.9	1708.8	1.1
25Oct1977	10:11	2.1	8.9	1708.8	1.1
25Oct1977	10:12	2.1	8.9	1708.8	1.1
25Oct1977	10:13	2.2	8.9	1708.8	1.1
25Oct1977	10:14	2.2	8.9	1708.8	1.1
25Oct1977	10:15	2.2	8.9	1708.8	1.1
25Oct1977	10:16	2.2	8.9	1708.8	1.1
25Oct1977	10:17	2.3	9.0	1708.8	1.1
25Oct1977	10:18	2.3	9.0	1708.8	1.1
25Oct1977	10:19	2.3	9.0	1708.8	1.2
25Oct1977	10:20	2.4	9.0	1708.8	1.2
25Oct1977	10:21	2.4	9.0	1708.8	1.2
25Oct1977	10:22	2.4	9.0	1708.8	1.2
25Oct1977	10:23	2.4	9.0	1708.8	1.2
25Oct1977	10:24	2.5	9.0	1708.8	1.2

25Oct1977	10:25	2.5	9.0	1708.8	1.2
25Oct1977	10:26	2.5	9.0	1708.8	1.3
25Oct1977	10:27	2.6	9.0	1708.8	1.3
25Oct1977	10:28	2.6	9.0	1708.8	1.3
25Oct1977	10:29	2.6	9.0	1708.8	1.3
25Oct1977	10:30	2.6	9.0	1708.8	1.3
25Oct1977	10:31	2.7	9.0	1708.8	1.3
25Oct1977	10:32	2.7	9.0	1708.8	1.3
25Oct1977	10:33	2.7	9.0	1708.8	1.4
25Oct1977	10:34	2.8	9.0	1708.8	1.4
25Oct1977	10:35	2.8	9.0	1708.8	1.4
25Oct1977	10:36	2.8	9.0	1708.8	1.4
25Oct1977	10:37	2.9	9.0	1708.9	1.4
25Oct1977	10:38	2.9	9.0	1708.9	1.4
25Oct1977	10:39	2.9	9.0	1708.9	1.5
25Oct1977	10:40	3.0	9.0	1708.9	1.5
25Oct1977	10:41	3.0	9.0	1708.9	1.5
25Oct1977	10:42	3.0	9.0	1708.9	1.5
25Oct1977	10:43	3.1	9.0	1708.9	1.5
25Oct1977	10:44	3.1	9.0	1708.9	1.5
25Oct1977	10:45	3.2	9.0	1708.9	1.6

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25Oct1977	10:46	3.2	9.0	1708.9	1.6
25Oct1977	10:47	3.2	9.0	1708.9	1.6
25Oct1977	10:48	3.3	9.0	1708.9	1.6
25Oct1977	10:49	3.3	9.0	1708.9	1.6
25Oct1977	10:50	3.4	9.0	1708.9	1.7
25Oct1977	10:51	3.4	9.0	1708.9	1.7
25Oct1977	10:52	3.5	9.0	1708.9	1.7
25Oct1977	10:53	3.5	9.0	1708.9	1.7
25Oct1977	10:54	3.6	9.0	1708.9	1.7
25Oct1977	10:55	3.6	9.0	1708.9	1.8
25Oct1977	10:56	3.7	9.0	1708.9	1.8
25Oct1977	10:57	3.7	9.0	1708.9	1.8
25Oct1977	10:58	3.8	9.0	1708.9	1.8
25Oct1977	10:59	3.8	9.0	1708.9	1.9
25Oct1977	11:00	3.9	9.0	1708.9	1.9
25Oct1977	11:01	4.0	9.0	1708.9	1.9
25Oct1977	11:02	4.0	9.0	1708.9	1.9
25Oct1977	11:03	4.1	9.0	1709.0	2.0
25Oct1977	11:04	4.1	9.1	1709.0	2.0
25Oct1977	11:05	4.2	9.1	1709.0	2.0
25Oct1977	11:06	4.2	9.1	1709.0	2.1

25Oct1977	11:07	4.3	9.1	1709.0	2.1
25Oct1977	11:08	4.3	9.1	1709.0	2.1
25Oct1977	11:09	4.4	9.1	1709.0	2.2
25Oct1977	11:10	4.4	9.1	1709.0	2.2
25Oct1977	11:11	4.5	9.1	1709.0	2.2
25Oct1977	11:12	4.6	9.1	1709.0	2.2
25Oct1977	11:13	4.7	9.1	1709.0	2.3
25Oct1977	11:14	4.7	9.1	1709.0	2.3
25Oct1977	11:15	4.8	9.1	1709.0	2.4
25Oct1977	11:16	4.9	9.1	1709.0	2.4
25Oct1977	11:17	5.0	9.1	1709.0	2.4
25Oct1977	11:18	5.1	9.1	1709.0	2.5
25Oct1977	11:19	5.2	9.1	1709.0	2.5
25Oct1977	11:20	5.3	9.1	1709.0	2.5
25Oct1977	11:21	5.4	9.1	1709.1	2.6
25Oct1977	11:22	5.6	9.1	1709.1	2.6
25Oct1977	11:23	5.7	9.1	1709.1	2.7
25Oct1977	11:24	5.8	9.1	1709.1	2.7
25Oct1977	11:25	5.9	9.1	1709.1	2.8
25Oct1977	11:26	6.0	9.1	1709.1	2.8
25Oct1977	11:27	6.2	9.1	1709.1	2.9

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25Oct1977	11:28	6.3	9.1	1709.1	2.9
25Oct1977	11:29	6.5	9.1	1709.1	3.0
25Oct1977	11:30	6.6	9.1	1709.1	3.0
25Oct1977	11:31	6.8	9.2	1709.1	3.1
25Oct1977	11:32	6.9	9.2	1709.1	3.2
25Oct1977	11:33	7.0	9.2	1709.1	3.2
25Oct1977	11:34	7.2	9.2	1709.2	3.3
25Oct1977	11:35	7.3	9.2	1709.2	3.4
25Oct1977	11:36	7.4	9.2	1709.2	3.4
25Oct1977	11:37	7.5	9.2	1709.2	3.5
25Oct1977	11:38	7.6	9.2	1709.2	3.6
25Oct1977	11:39	7.8	9.2	1709.2	3.6
25Oct1977	11:40	8.1	9.2	1709.2	3.7
25Oct1977	11:41	8.6	9.2	1709.2	3.8
25Oct1977	11:42	9.2	9.2	1709.2	3.9
25Oct1977	11:43	10.0	9.2	1709.2	4.0
25Oct1977	11:44	11.0	9.2	1709.3	4.1
25Oct1977	11:45	12.3	9.2	1709.3	4.3
25Oct1977	11:46	13.9	9.3	1709.3	4.4
25Oct1977	11:47	15.8	9.3	1709.3	4.6
25Oct1977	11:48	17.9	9.3	1709.3	4.9

25Oct1977	11:49	20.3	9.3	1709.4	5.2
25Oct1977	11:50	22.9	9.3	1709.4	5.5
25Oct1977	11:51	25.6	9.4	1709.5	5.9
25Oct1977	11:52	28.5	9.4	1709.5	6.4
25Oct1977	11:53	31.5	9.4	1709.6	6.9
25Oct1977	11:54	34.7	9.4	1709.6	7.6
25Oct1977	11:55	38.3	9.5	1709.7	8.3
25Oct1977	11:56	42.5	9.5	1709.8	9.1
25Oct1977	11:57	47.4	9.6	1709.8	10.1
25Oct1977	11:58	53.4	9.6	1709.9	11.2
25Oct1977	11:59	60.5	9.7	1710.0	12.6
25Oct1977	12:00	69.1	9.8	1710.1	14.2
25Oct1977	12:01	80.0	9.8	1710.3	16.1
25Oct1977	12:02	90.5	9.9	1710.4	18.5
25Oct1977	12:03	99.7	10.0	1710.6	21.2
25Oct1977	12:04	107.4	10.2	1710.8	24.2
25Oct1977	12:05	113.1	10.3	1711.0	27.6
25Oct1977	12:06	116.6	10.4	1711.2	31.0
25Oct1977	12:07	117.7	10.5	1711.4	34.5
25Oct1977	12:08	116.5	10.6	1711.5	37.9
25Oct1977	12:09	113.0	10.7	1711.7	41.2

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25Oct1977	12:10	107.4	10.8	1711.9	44.1
25Oct1977	12:11	100.1	10.9	1712.0	46.6
25Oct1977	12:12	91.6	11.0	1712.1	48.7
25Oct1977	12:13	82.3	11.0	1712.2	50.3
25Oct1977	12:14	72.9	11.1	1712.3	51.4
25Oct1977	12:15	63.8	11.1	1712.3	52.1
25Oct1977	12:16	55.5	11.1	1712.3	52.4
25Oct1977	12:17	48.2	11.1	1712.3	52.4
25Oct1977	12:18	42.2	11.1	1712.3	52.1
25Oct1977	12:19	37.4	11.1	1712.3	51.6
25Oct1977	12:20	33.6	11.0	1712.2	50.9
25Oct1977	12:21	30.8	11.0	1712.2	50.1
25Oct1977	12:22	28.6	11.0	1712.1	49.3
25Oct1977	12:23	26.9	11.0	1712.1	48.4
25Oct1977	12:24	25.5	10.9	1712.1	47.4
25Oct1977	12:25	24.2	10.9	1712.0	46.5
25Oct1977	12:26	23.0	10.9	1712.0	45.5
25Oct1977	12:27	21.8	10.8	1711.9	44.5
25Oct1977	12:28	20.8	10.8	1711.8	43.6
25Oct1977	12:29	19.8	10.8	1711.8	42.6
25Oct1977	12:30	18.9	10.7	1711.7	41.6

25Oct1977	12:31	18.1	10.7	1711.7	40.6
25Oct1977	12:32	17.4	10.7	1711.6	39.7
25Oct1977	12:33	16.7	10.6	1711.6	38.7
25Oct1977	12:34	16.2	10.6	1711.5	37.8
25Oct1977	12:35	15.6	10.6	1711.5	36.9
25Oct1977	12:36	15.1	10.6	1711.4	36.0
25Oct1977	12:37	14.6	10.5	1711.4	35.1
25Oct1977	12:38	14.1	10.5	1711.4	34.3
25Oct1977	12:39	13.6	10.5	1711.3	33.4
25Oct1977	12:40	13.1	10.4	1711.3	32.6
25Oct1977	12:41	12.7	10.4	1711.2	31.8
25Oct1977	12:42	12.3	10.4	1711.2	31.0
25Oct1977	12:43	11.9	10.4	1711.1	30.3
25Oct1977	12:44	11.5	10.3	1711.1	29.5
25Oct1977	12:45	11.2	10.3	1711.0	28.8
25Oct1977	12:46	10.9	10.3	1711.0	28.1
25Oct1977	12:47	10.7	10.3	1711.0	27.4
25Oct1977	12:48	10.5	10.2	1710.9	26.8
25Oct1977	12:49	10.3	10.2	1710.9	26.1
25Oct1977	12:50	10.1	10.2	1710.9	25.5
25Oct1977	12:51	10.0	10.2	1710.8	24.9

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25Oct1977	12:52	9.8	10.2	1710.8	24.4
25Oct1977	12:53	9.7	10.1	1710.8	23.8
25Oct1977	12:54	9.6	10.1	1710.7	23.3
25Oct1977	12:55	9.4	10.1	1710.7	22.8
25Oct1977	12:56	9.3	10.1	1710.7	22.3
25Oct1977	12:57	9.2	10.1	1710.6	21.8
25Oct1977	12:58	9.0	10.1	1710.6	21.3
25Oct1977	12:59	8.9	10.0	1710.6	20.9
25Oct1977	13:00	8.8	10.0	1710.6	20.5
25Oct1977	13:01	8.7	10.0	1710.5	20.0
25Oct1977	13:02	8.6	10.0	1710.5	19.6
25Oct1977	13:03	8.5	10.0	1710.5	19.2
25Oct1977	13:04	8.3	10.0	1710.5	18.9
25Oct1977	13:05	8.2	9.9	1710.4	18.5
25Oct1977	13:06	8.1	9.9	1710.4	18.1
25Oct1977	13:07	8.0	9.9	1710.4	17.8
25Oct1977	13:08	7.9	9.9	1710.4	17.5
25Oct1977	13:09	7.8	9.9	1710.3	17.1
25Oct1977	13:10	7.8	9.9	1710.3	16.8
25Oct1977	13:11	7.7	9.9	1710.3	16.5
25Oct1977	13:12	7.6	9.9	1710.3	16.2

25Oct1977	13:13	7.5	9.8	1710.3	15.9
25Oct1977	13:14	7.4	9.8	1710.2	15.7
25Oct1977	13:15	7.4	9.8	1710.2	15.4
25Oct1977	13:16	7.3	9.8	1710.2	15.1
25Oct1977	13:17	7.2	9.8	1710.2	14.9
25Oct1977	13:18	7.1	9.8	1710.2	14.6
25Oct1977	13:19	7.1	9.8	1710.2	14.4
25Oct1977	13:20	7.0	9.8	1710.1	14.1
25Oct1977	13:21	6.9	9.8	1710.1	13.9
25Oct1977	13:22	6.8	9.7	1710.1	13.7
25Oct1977	13:23	6.8	9.7	1710.1	13.5
25Oct1977	13:24	6.7	9.7	1710.1	13.3
25Oct1977	13:25	6.6	9.7	1710.1	13.1
25Oct1977	13:26	6.6	9.7	1710.0	12.9
25Oct1977	13:27	6.5	9.7	1710.0	12.7
25Oct1977	13:28	6.5	9.7	1710.0	12.5
25Oct1977	13:29	6.4	9.7	1710.0	12.3
25Oct1977	13:30	6.4	9.7	1710.0	12.1
25Oct1977	13:31	6.4	9.7	1710.0	12.0
25Oct1977	13:32	6.3	9.7	1710.0	11.8
25Oct1977	13:33	6.3	9.7	1710.0	11.6

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25Oct1977	13:34	6.2	9.6	1709.9	11.5
25Oct1977	13:35	6.2	9.6	1709.9	11.3
25Oct1977	13:36	6.1	9.6	1709.9	11.2
25Oct1977	13:37	6.0	9.6	1709.9	11.0
25Oct1977	13:38	6.0	9.6	1709.9	10.9
25Oct1977	13:39	5.9	9.6	1709.9	10.8
25Oct1977	13:40	5.9	9.6	1709.9	10.6
25Oct1977	13:41	5.8	9.6	1709.9	10.5
25Oct1977	13:42	5.8	9.6	1709.9	10.4
25Oct1977	13:43	5.7	9.6	1709.8	10.2
25Oct1977	13:44	5.7	9.6	1709.8	10.1
25Oct1977	13:45	5.6	9.6	1709.8	10.0
25Oct1977	13:46	5.6	9.6	1709.8	9.9
25Oct1977	13:47	5.5	9.6	1709.8	9.7
25Oct1977	13:48	5.5	9.6	1709.8	9.6
25Oct1977	13:49	5.4	9.5	1709.8	9.5
25Oct1977	13:50	5.4	9.5	1709.8	9.4
25Oct1977	13:51	5.4	9.5	1709.8	9.3
25Oct1977	13:52	5.3	9.5	1709.8	9.2
25Oct1977	13:53	5.3	9.5	1709.7	9.1
25Oct1977	13:54	5.2	9.5	1709.7	9.0

25Oct1977	13:55	5.2	9.5	1709.7	8.9
25Oct1977	13:56	5.2	9.5	1709.7	8.8
25Oct1977	13:57	5.1	9.5	1709.7	8.7
25Oct1977	13:58	5.1	9.5	1709.7	8.6
25Oct1977	13:59	5.0	9.5	1709.7	8.5
25Oct1977	14:00	5.0	9.5	1709.7	8.4
25Oct1977	14:01	5.0	9.5	1709.7	8.3
25Oct1977	14:02	4.9	9.5	1709.7	8.2
25Oct1977	14:03	4.9	9.5	1709.7	8.2
25Oct1977	14:04	4.8	9.5	1709.7	8.1
25Oct1977	14:05	4.8	9.5	1709.7	8.0
25Oct1977	14:06	4.8	9.5	1709.6	7.9
25Oct1977	14:07	4.7	9.5	1709.6	7.8
25Oct1977	14:08	4.7	9.5	1709.6	7.8
25Oct1977	14:09	4.7	9.5	1709.6	7.7
25Oct1977	14:10	4.6	9.4	1709.6	7.6
25Oct1977	14:11	4.6	9.4	1709.6	7.5
25Oct1977	14:12	4.6	9.4	1709.6	7.5
25Oct1977	14:13	4.5	9.4	1709.6	7.4
25Oct1977	14:14	4.5	9.4	1709.6	7.3
25Oct1977	14:15	4.5	9.4	1709.6	7.3

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25Oct1977	14:16	4.5	9.4	1709.6	7.2
25Oct1977	14:17	4.4	9.4	1709.6	7.1
25Oct1977	14:18	4.4	9.4	1709.6	7.1
25Oct1977	14:19	4.4	9.4	1709.6	7.0
25Oct1977	14:20	4.4	9.4	1709.6	6.9
25Oct1977	14:21	4.3	9.4	1709.5	6.9
25Oct1977	14:22	4.3	9.4	1709.5	6.8
25Oct1977	14:23	4.3	9.4	1709.5	6.8
25Oct1977	14:24	4.3	9.4	1709.5	6.7
25Oct1977	14:25	4.3	9.4	1709.5	6.7
25Oct1977	14:26	4.2	9.4	1709.5	6.6
25Oct1977	14:27	4.2	9.4	1709.5	6.5
25Oct1977	14:28	4.2	9.4	1709.5	6.5
25Oct1977	14:29	4.2	9.4	1709.5	6.4
25Oct1977	14:30	4.2	9.4	1709.5	6.4
25Oct1977	14:31	4.1	9.4	1709.5	6.3
25Oct1977	14:32	4.1	9.4	1709.5	6.3
25Oct1977	14:33	4.1	9.4	1709.5	6.2
25Oct1977	14:34	4.1	9.4	1709.5	6.2
25Oct1977	14:35	4.1	9.4	1709.5	6.1
25Oct1977	14:36	4.1	9.4	1709.5	6.1

25Oct1977	14:37	4.1	9.4	1709.5	6.0
25Oct1977	14:38	4.0	9.4	1709.5	6.0
25Oct1977	14:39	4.0	9.4	1709.5	6.0
25Oct1977	14:40	4.0	9.4	1709.5	5.9
25Oct1977	14:41	4.0	9.3	1709.4	5.9
25Oct1977	14:42	4.0	9.3	1709.4	5.8
25Oct1977	14:43	4.0	9.3	1709.4	5.8
25Oct1977	14:44	4.0	9.3	1709.4	5.8
25Oct1977	14:45	4.0	9.3	1709.4	5.7
25Oct1977	14:46	4.0	9.3	1709.4	5.7
25Oct1977	14:47	4.0	9.3	1709.4	5.6
25Oct1977	14:48	3.9	9.3	1709.4	5.6
25Oct1977	14:49	3.9	9.3	1709.4	5.6
25Oct1977	14:50	3.9	9.3	1709.4	5.5
25Oct1977	14:51	3.9	9.3	1709.4	5.5
25Oct1977	14:52	3.9	9.3	1709.4	5.5
25Oct1977	14:53	3.9	9.3	1709.4	5.4
25Oct1977	14:54	3.9	9.3	1709.4	5.4
25Oct1977	14:55	3.9	9.3	1709.4	5.4
25Oct1977	14:56	3.8	9.3	1709.4	5.3
25Oct1977	14:57	3.8	9.3	1709.4	5.3

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25Oct1977	14:58	3.8	9.3	1709.4	5.3
25Oct1977	14:59	3.8	9.3	1709.4	5.2
25Oct1977	15:00	3.8	9.3	1709.4	5.2
25Oct1977	15:01	3.8	9.3	1709.4	5.2
25Oct1977	15:02	3.8	9.3	1709.4	5.2
25Oct1977	15:03	3.8	9.3	1709.4	5.1
25Oct1977	15:04	3.7	9.3	1709.4	5.1
25Oct1977	15:05	3.7	9.3	1709.4	5.1
25Oct1977	15:06	3.7	9.3	1709.4	5.0
25Oct1977	15:07	3.7	9.3	1709.4	5.0
25Oct1977	15:08	3.7	9.3	1709.4	5.0
25Oct1977	15:09	3.6	9.3	1709.4	5.0
25Oct1977	15:10	3.6	9.3	1709.3	4.9
25Oct1977	15:11	3.6	9.3	1709.3	4.9
25Oct1977	15:12	3.6	9.3	1709.3	4.9
25Oct1977	15:13	3.6	9.3	1709.3	4.9
25Oct1977	15:14	3.6	9.3	1709.3	4.8
25Oct1977	15:15	3.6	9.3	1709.3	4.8
25Oct1977	15:16	3.6	9.3	1709.3	4.8
25Oct1977	15:17	3.6	9.3	1709.3	4.8
25Oct1977	15:18	3.6	9.3	1709.3	4.7

25Oct1977	15:19	3.5	9.3	1709.3	4.7
25Oct1977	15:20	3.5	9.3	1709.3	4.7
25Oct1977	15:21	3.5	9.3	1709.3	4.7
25Oct1977	15:22	3.5	9.3	1709.3	4.6
25Oct1977	15:23	3.5	9.3	1709.3	4.6
25Oct1977	15:24	3.5	9.3	1709.3	4.6
25Oct1977	15:25	3.4	9.3	1709.3	4.6
25Oct1977	15:26	3.4	9.3	1709.3	4.5
25Oct1977	15:27	3.4	9.3	1709.3	4.5
25Oct1977	15:28	3.4	9.3	1709.3	4.5
25Oct1977	15:29	3.4	9.3	1709.3	4.5
25Oct1977	15:30	3.4	9.3	1709.3	4.5
25Oct1977	15:31	3.3	9.3	1709.3	4.4
25Oct1977	15:32	3.3	9.3	1709.3	4.4
25Oct1977	15:33	3.3	9.2	1709.3	4.4
25Oct1977	15:34	3.3	9.2	1709.3	4.4
25Oct1977	15:35	3.3	9.2	1709.3	4.4
25Oct1977	15:36	3.3	9.2	1709.3	4.3
25Oct1977	15:37	3.3	9.2	1709.3	4.3
25Oct1977	15:38	3.2	9.2	1709.3	4.3
25Oct1977	15:39	3.2	9.2	1709.3	4.3

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25Oct1977	15:40	3.2	9.2	1709.3	4.3
25Oct1977	15:41	3.2	9.2	1709.3	4.2
25Oct1977	15:42	3.2	9.2	1709.3	4.2
25Oct1977	15:43	3.2	9.2	1709.3	4.2
25Oct1977	15:44	3.2	9.2	1709.3	4.2
25Oct1977	15:45	3.2	9.2	1709.3	4.2
25Oct1977	15:46	3.1	9.2	1709.3	4.1
25Oct1977	15:47	3.1	9.2	1709.3	4.1
25Oct1977	15:48	3.1	9.2	1709.3	4.1
25Oct1977	15:49	3.1	9.2	1709.3	4.1
25Oct1977	15:50	3.1	9.2	1709.2	4.1
25Oct1977	15:51	3.1	9.2	1709.2	4.0
25Oct1977	15:52	3.1	9.2	1709.2	4.0
25Oct1977	15:53	3.1	9.2	1709.2	4.0
25Oct1977	15:54	3.1	9.2	1709.2	4.0
25Oct1977	15:55	3.1	9.2	1709.2	4.0
25Oct1977	15:56	3.1	9.2	1709.2	4.0
25Oct1977	15:57	3.1	9.2	1709.2	3.9
25Oct1977	15:58	3.0	9.2	1709.2	3.9
25Oct1977	15:59	3.0	9.2	1709.2	3.9
25Oct1977	16:00	3.0	9.2	1709.2	3.9

25Oct1977	16:01	3.0	9.2	1709.2	3.9
25Oct1977	16:02	3.0	9.2	1709.2	3.9
25Oct1977	16:03	2.9	9.2	1709.2	3.8
25Oct1977	16:04	2.9	9.2	1709.2	3.8
25Oct1977	16:05	2.9	9.2	1709.2	3.8
25Oct1977	16:06	2.9	9.2	1709.2	3.8
25Oct1977	16:07	2.9	9.2	1709.2	3.8
25Oct1977	16:08	2.9	9.2	1709.2	3.8
25Oct1977	16:09	2.8	9.2	1709.2	3.7
25Oct1977	16:10	2.8	9.2	1709.2	3.7
25Oct1977	16:11	2.8	9.2	1709.2	3.7
25Oct1977	16:12	2.8	9.2	1709.2	3.7
25Oct1977	16:13	2.8	9.2	1709.2	3.7
25Oct1977	16:14	2.8	9.2	1709.2	3.7
25Oct1977	16:15	2.8	9.2	1709.2	3.7
25Oct1977	16:16	2.8	9.2	1709.2	3.6
25Oct1977	16:17	2.8	9.2	1709.2	3.6
25Oct1977	16:18	2.7	9.2	1709.2	3.6
25Oct1977	16:19	2.7	9.2	1709.2	3.6
25Oct1977	16:20	2.7	9.2	1709.2	3.6
25Oct1977	16:21	2.7	9.2	1709.2	3.6

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25Oct1977	16:22	2.7	9.2	1709.2	3.5
25Oct1977	16:23	2.7	9.2	1709.2	3.5
25Oct1977	16:24	2.7	9.2	1709.2	3.5
25Oct1977	16:25	2.7	9.2	1709.2	3.5
25Oct1977	16:26	2.7	9.2	1709.2	3.5
25Oct1977	16:27	2.7	9.2	1709.2	3.5
25Oct1977	16:28	2.7	9.2	1709.2	3.5
25Oct1977	16:29	2.7	9.2	1709.2	3.4
25Oct1977	16:30	2.7	9.2	1709.2	3.4
25Oct1977	16:31	2.7	9.2	1709.2	3.4
25Oct1977	16:32	2.7	9.2	1709.2	3.4
25Oct1977	16:33	2.7	9.2	1709.2	3.4
25Oct1977	16:34	2.7	9.2	1709.2	3.4
25Oct1977	16:35	2.7	9.2	1709.2	3.4
25Oct1977	16:36	2.7	9.2	1709.2	3.4
25Oct1977	16:37	2.6	9.2	1709.2	3.3
25Oct1977	16:38	2.6	9.2	1709.2	3.3
25Oct1977	16:39	2.6	9.2	1709.2	3.3
25Oct1977	16:40	2.6	9.2	1709.2	3.3
25Oct1977	16:41	2.6	9.2	1709.2	3.3
25Oct1977	16:42	2.6	9.2	1709.1	3.3

25Oct1977	16:43	2.6	9.2	1709.1	3.3
25Oct1977	16:44	2.6	9.2	1709.1	3.3
25Oct1977	16:45	2.6	9.2	1709.1	3.3
25Oct1977	16:46	2.6	9.2	1709.1	3.2
25Oct1977	16:47	2.6	9.2	1709.1	3.2
25Oct1977	16:48	2.6	9.2	1709.1	3.2
25Oct1977	16:49	2.6	9.2	1709.1	3.2
25Oct1977	16:50	2.6	9.2	1709.1	3.2
25Oct1977	16:51	2.6	9.2	1709.1	3.2
25Oct1977	16:52	2.6	9.2	1709.1	3.2
25Oct1977	16:53	2.5	9.2	1709.1	3.2
25Oct1977	16:54	2.5	9.2	1709.1	3.2
25Oct1977	16:55	2.5	9.2	1709.1	3.2
25Oct1977	16:56	2.5	9.2	1709.1	3.1
25Oct1977	16:57	2.5	9.2	1709.1	3.1
25Oct1977	16:58	2.5	9.2	1709.1	3.1
25Oct1977	16:59	2.5	9.2	1709.1	3.1
25Oct1977	17:00	2.5	9.2	1709.1	3.1
25Oct1977	17:01	2.5	9.2	1709.1	3.1
25Oct1977	17:02	2.5	9.1	1709.1	3.1
25Oct1977	17:03	2.5	9.1	1709.1	3.1

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25Oct1977	17:04	2.5	9.1	1709.1	3.1
25Oct1977	17:05	2.5	9.1	1709.1	3.1
25Oct1977	17:06	2.5	9.1	1709.1	3.0
25Oct1977	17:07	2.5	9.1	1709.1	3.0
25Oct1977	17:08	2.5	9.1	1709.1	3.0
25Oct1977	17:09	2.5	9.1	1709.1	3.0
25Oct1977	17:10	2.5	9.1	1709.1	3.0
25Oct1977	17:11	2.5	9.1	1709.1	3.0
25Oct1977	17:12	2.5	9.1	1709.1	3.0
25Oct1977	17:13	2.5	9.1	1709.1	3.0
25Oct1977	17:14	2.5	9.1	1709.1	3.0
25Oct1977	17:15	2.5	9.1	1709.1	3.0
25Oct1977	17:16	2.4	9.1	1709.1	3.0
25Oct1977	17:17	2.4	9.1	1709.1	3.0
25Oct1977	17:18	2.4	9.1	1709.1	2.9
25Oct1977	17:19	2.4	9.1	1709.1	2.9
25Oct1977	17:20	2.4	9.1	1709.1	2.9
25Oct1977	17:21	2.4	9.1	1709.1	2.9
25Oct1977	17:22	2.4	9.1	1709.1	2.9
25Oct1977	17:23	2.4	9.1	1709.1	2.9
25Oct1977	17:24	2.4	9.1	1709.1	2.9

25Oct1977	17:25	2.4	9.1	1709.1	2.9
25Oct1977	17:26	2.4	9.1	1709.1	2.9
25Oct1977	17:27	2.4	9.1	1709.1	2.9
25Oct1977	17:28	2.4	9.1	1709.1	2.9
25Oct1977	17:29	2.4	9.1	1709.1	2.9
25Oct1977	17:30	2.4	9.1	1709.1	2.9
25Oct1977	17:31	2.4	9.1	1709.1	2.8
25Oct1977	17:32	2.3	9.1	1709.1	2.8
25Oct1977	17:33	2.3	9.1	1709.1	2.8
25Oct1977	17:34	2.3	9.1	1709.1	2.8
25Oct1977	17:35	2.3	9.1	1709.1	2.8
25Oct1977	17:36	2.3	9.1	1709.1	2.8
25Oct1977	17:37	2.3	9.1	1709.1	2.8
25Oct1977	17:38	2.3	9.1	1709.1	2.8
25Oct1977	17:39	2.4	9.1	1709.1	2.8
25Oct1977	17:40	2.4	9.1	1709.1	2.8
25Oct1977	17:41	2.4	9.1	1709.1	2.8
25Oct1977	17:42	2.4	9.1	1709.1	2.8
25Oct1977	17:43	2.3	9.1	1709.1	2.8
25Oct1977	17:44	2.3	9.1	1709.1	2.8
25Oct1977	17:45	2.3	9.1	1709.1	2.7

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25Oct1977	17:46	2.3	9.1	1709.1	2.7
25Oct1977	17:47	2.3	9.1	1709.1	2.7
25Oct1977	17:48	2.3	9.1	1709.1	2.7
25Oct1977	17:49	2.3	9.1	1709.1	2.7
25Oct1977	17:50	2.3	9.1	1709.1	2.7
25Oct1977	17:51	2.3	9.1	1709.1	2.7
25Oct1977	17:52	2.3	9.1	1709.1	2.7
25Oct1977	17:53	2.3	9.1	1709.1	2.7
25Oct1977	17:54	2.3	9.1	1709.1	2.7
25Oct1977	17:55	2.3	9.1	1709.1	2.7
25Oct1977	17:56	2.2	9.1	1709.1	2.7
25Oct1977	17:57	2.2	9.1	1709.1	2.7
25Oct1977	17:58	2.2	9.1	1709.1	2.7
25Oct1977	17:59	2.2	9.1	1709.1	2.7
25Oct1977	18:00	2.2	9.1	1709.1	2.6
25Oct1977	18:01	2.2	9.1	1709.1	2.6
25Oct1977	18:02	2.2	9.1	1709.1	2.6
25Oct1977	18:03	2.2	9.1	1709.1	2.6
25Oct1977	18:04	2.2	9.1	1709.1	2.6
25Oct1977	18:05	2.2	9.1	1709.1	2.6
25Oct1977	18:06	2.2	9.1	1709.1	2.6

25Oct1977	18:07	2.2	9.1	1709.1	2.6
25Oct1977	18:08	2.2	9.1	1709.1	2.6
25Oct1977	18:09	2.2	9.1	1709.1	2.6
25Oct1977	18:10	2.2	9.1	1709.1	2.6
25Oct1977	18:11	2.2	9.1	1709.0	2.6
25Oct1977	18:12	2.2	9.1	1709.0	2.6
25Oct1977	18:13	2.2	9.1	1709.0	2.6
25Oct1977	18:14	2.2	9.1	1709.0	2.6
25Oct1977	18:15	2.2	9.1	1709.0	2.6
25Oct1977	18:16	2.2	9.1	1709.0	2.6
25Oct1977	18:17	2.2	9.1	1709.0	2.5
25Oct1977	18:18	2.2	9.1	1709.0	2.5
25Oct1977	18:19	2.1	9.1	1709.0	2.5
25Oct1977	18:20	2.1	9.1	1709.0	2.5
25Oct1977	18:21	2.1	9.1	1709.0	2.5
25Oct1977	18:22	2.1	9.1	1709.0	2.5
25Oct1977	18:23	2.1	9.1	1709.0	2.5
25Oct1977	18:24	2.1	9.1	1709.0	2.5
25Oct1977	18:25	2.1	9.1	1709.0	2.5
25Oct1977	18:26	2.1	9.1	1709.0	2.5
25Oct1977	18:27	2.1	9.1	1709.0	2.5

DEC 2 8 2016

25Oct1977	18:28	2.1	9.1	1709.0	2.5
25Oct1977	18:29	2.1	9.1	1709.0	2.5
25Oct1977	18:30	2.1	9.1	1709.0	2.5
25Oct1977	18:31	2.1	9.1	1709.0	2.5
25Oct1977	18:32	2.1	9.1	1709.0	2.5
25Oct1977	18:33	2.1	9.1	1709.0	2.5
25Oct1977	18:34	2.1	9.1	1709.0	2.5
25Oct1977	18:35	2.1	9.1	1709.0	2.4
25Oct1977	18:36	2.1	9.1	1709.0	2.4
25Oct1977	18:37	2.1	9.1	1709.0	2.4
25Oct1977	18:38	2.1	9.1	1709.0	2.4
25Oct1977	18:39	2.1	9.1	1709.0	2.4
25Oct1977	18:40	2.0	9.1	1709.0	2.4
25Oct1977	18:41	2.0	9.1	1709.0	2.4
25Oct1977	18:42	2.0	9.1	1709.0	2.4
25Oct1977	18:43	2.0	9.1	1709.0	2.4
25Oct1977	18:44	2.0	9.1	1709.0	2.4
25Oct1977	18:45	2.0	9.1	1709.0	2.4
25Oct1977	18:46	2.0	9.1	1709.0	2.4
25Oct1977	18:47	2.0	9.1	1709.0	2.4
25Oct1977	18:48	2.0	9.1	1709.0	2.4

25Oct1977	18:49	2.0	9.1	1709.0	2.4
25Oct1977	18:50	2.0	9.1	1709.0	2.4
25Oct1977	18:51	2.0	9.1	1709.0	2.4
25Oct1977	18:52	2.0	9.1	1709.0	2.4
25Oct1977	18:53	2.0	9.1	1709.0	2.3
25Oct1977	18:54	2.0	9.1	1709.0	2.3
25Oct1977	18:55	2.0	9.1	1709.0	2.3
25Oct1977	18:56	2.0	9.1	1709.0	2.3
25Oct1977	18:57	2.0	9.1	1709.0	2.3
25Oct1977	18:58	2.0	9.1	1709.0	2.3
25Oct1977	18:59	2.0	9.1	1709.0	2.3
25Oct1977	19:00	2.0	9.1	1709.0	2.3
25Oct1977	19:01	2.0	9.1	1709.0	2.3
25Oct1977	19:02	2.0	9.1	1709.0	2.3
25Oct1977	19:03	1.9	9.1	1709.0	2.3
25Oct1977	19:04	1.9	9.1	1709.0	2.3
25Oct1977	19:05	1.9	9.1	1709.0	2.3
25Oct1977	19:06	1.9	9.1	1709.0	2.3
25Oct1977	19:07	1.9	9.1	1709.0	2.3
25Oct1977	19:08	1.9	9.1	1709.0	2.3
25Oct1977	19:09	1.9	9.1	1709.0	2.3

DEC 2 8 2016

25Oct1977	19:10	1.9	9.1	1709.0	2.3
25Oct1977	19:11	1.9	9.1	1709.0	2.3
25Oct1977	19:12	1.9	9.1	1709.0	2.2
25Oct1977	19:13	1.9	9.1	1709.0	2.2
25Oct1977	19:14	1.9	9.1	1709.0	2.2
25Oct1977	19:15	1.9	9.1	1709.0	2.2
25Oct1977	19:16	1.9	9.1	1709.0	2.2
25Oct1977	19:17	1.9	9.1	1709.0	2.2
25Oct1977	19:18	1.9	9.1	1709.0	2.2
25Oct1977	19:19	1.9	9.1	1709.0	2.2
25Oct1977	19:20	1.9	9.1	1709.0	2.2
25Oct1977	19:21	1.9	9.1	1709.0	2.2
25Oct1977	19:22	1.9	9.1	1709.0	2.2
25Oct1977	19:23	1.8	9.1	1709.0	2.2
25Oct1977	19:24	1.8	9.1	1709.0	2.2
25Oct1977	19:25	1.8	9.1	1709.0	2.2
25Oct1977	19:26	1.8	9.1	1709.0	2.2
25Oct1977	19:27	1.8	9.1	1709.0	2.2
25Oct1977	19:28	1.8	9.1	1709.0	2.2
25Oct1977	19:29	1.8	9.1	1709.0	2.2
25Oct1977	19:30	1.8	9.1	1709.0	2.2

25Oct1977	19:31	1.8	9.1	1709.0	2.2
25Oct1977	19:32	1.8	9.1	1709.0	2.2
25Oct1977	19:33	1.8	9.1	1709.0	2.1
25Oct1977	19:34	1.8	9.1	1709.0	2.1
25Oct1977	19:35	1.8	9.1	1709.0	2.1
25Oct1977	19:36	1.8	9.1	1709.0	2.1
25Oct1977	19:37	1.8	9.1	1709.0	2.1
25Oct1977	19:38	1.8	9.1	1709.0	2.1
25Oct1977	19:39	1.8	9.1	1709.0	2.1
25Oct1977	19:40	1.7	9.1	1709.0	2.1
25Oct1977	19:41	1.7	9.1	1709.0	2.1
25Oct1977	19:42	1.7	9.1	1709.0	2.1
25Oct1977	19:43	1.7	9.1	1709.0	2.1
25Oct1977	19:44	1.7	9.1	1709.0	2.1
25Oct1977	19:45	1.7	9.1	1709.0	2.1
25Oct1977	19:46	1.7	9.1	1709.0	2.1
25Oct1977	19:47	1.7	9.1	1709.0	2.1
25Oct1977	19:48	1.7	9.1	1709.0	2.1
25Oct1977	19:49	1.7	9.1	1709.0	2.1
25Oct1977	19:50	1.7	9.1	1709.0	2.1
25Oct1977	19:51	1.7	9.1	1709.0	2.1

DEC 2 8 2016

25Oct1977	19:52	1.7	9.1	1709.0	2.1
25Oct1977	19:53	1.7	9.1	1709.0	2.0
25Oct1977	19:54	1.7	9.1	1709.0	2.0
25Oct1977	19:55	1.7	9.1	1709.0	2.0
25Oct1977	19:56	1.7	9.1	1709.0	2.0
25Oct1977	19:57	1.6	9.1	1709.0	2.0
25Oct1977	19:58	1.6	9.1	1709.0	2.0
25Oct1977	19:59	1.6	9.1	1709.0	2.0
25Oct1977	20:00	1.6	9.1	1709.0	2.0
25Oct1977	20:01	1.6	9.1	1709.0	2.0
25Oct1977	20:02	1.7	9.1	1709.0	2.0
25Oct1977	20:03	1.7	9.1	1709.0	2.0
25Oct1977	20:04	1.7	9.0	1709.0	2.0
25Oct1977	20:05	1.7	9.0	1709.0	2.0
25Oct1977	20:06	1.7	9.0	1709.0	2.0
25Oct1977	20:07	1.7	9.0	1709.0	2.0
25Oct1977	20:08	1.6	9.0	1709.0	2.0
25Oct1977	20:09	1.6	9.0	1709.0	2.0
25Oct1977	20:10	1.6	9.0	1709.0	2.0
25Oct1977	20:11	1.6	9.0	1709.0	2.0
25Oct1977	20:12	1.6	9.0	1709.0	2.0

25Oct1977	20:13	1.6	9.0	1708.9	2.0
25Oct1977	20:14	1.6	9.0	1708.9	1.9
25Oct1977	20:15	1.6	9.0	1708.9	1.9
25Oct1977	20:16	1.6	9.0	1708.9	1.9
25Oct1977	20:17	1.6	9.0	1708.9	1.9
25Oct1977	20:18	1.6	9.0	1708.9	1.9
25Oct1977	20:19	1.6	9.0	1708.9	1.9
25Oct1977	20:20	1.6	9.0	1708.9	1.9
25Oct1977	20:21	1.6	9.0	1708.9	1.9
25Oct1977	20:22	1.6	9.0	1708.9	1.9
25Oct1977	20:23	1.6	9.0	1708.9	1.9
25Oct1977	20:24	1.6	9.0	1708.9	1.9
25Oct1977	20:25	1.6	9.0	1708.9	1.9
25Oct1977	20:26	1.6	9.0	1708.9	1.9
25Oct1977	20:27	1.6	9.0	1708.9	1.9
25Oct1977	20:28	1.6	9.0	1708.9	1.9
25Oct1977	20:29	1.6	9.0	1708.9	1.9
25Oct1977	20:30	1.6	9.0	1708.9	1.9
25Oct1977	20:31	1.6	9.0	1708.9	1.9
25Oct1977	20:32	1.6	9.0	1708.9	1.9
25Oct1977	20:33	1.6	9.0	1708.9	1.9

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25Oct1977	20:34	1.6	9.0	1708.9	1.9
25Oct1977	20:35	1.6	9.0	1708.9	1.9
25Oct1977	20:36	1.6	9.0	1708.9	1.9
25Oct1977	20:37	1.5	9.0	1708.9	1.9
25Oct1977	20:38	1.5	9.0	1708.9	1.8
25Oct1977	20:39	1.5	9.0	1708.9	1.8
25Oct1977	20:40	1.5	9.0	1708.9	1.8
25Oct1977	20:41	1.5	9.0	1708.9	1.8
25Oct1977	20:42	1.5	9.0	1708.9	1.8
25Oct1977	20:43	1.5	9.0	1708.9	1.8
25Oct1977	20:44	1.5	9.0	1708.9	1.8
25Oct1977	20:45	1.5	9.0	1708.9	1.8
25Oct1977	20:46	1.5	9.0	1708.9	1.8
25Oct1977	20:47	1.5	9.0	1708.9	1.8
25Oct1977	20:48	1.6	9.0	1708.9	1.8
25Oct1977	20:49	1.6	9.0	1708.9	1.8
25Oct1977	20:50	1.6	9.0	1708.9	1.8
25Oct1977	20:51	1.6	9.0	1708.9	1.8
25Oct1977	20:52	1.6	9.0	1708.9	1.8
25Oct1977	20:53	1.6	9.0	1708.9	1.8
25Oct1977	20:54	1.5	9.0	1708.9	1.8

25Oct1977	20:55	1.5	9.0	1708.9	1.8
25Oct1977	20:56	1.5	9.0	1708.9	1.8
25Oct1977	20:57	1.5	9.0	1708.9	1.8
25Oct1977	20:58	1.5	9.0	1708.9	1.8
25Oct1977	20:59	1.5	9.0	1708.9	1.8
25Oct1977	21:00	1.5	9.0	1708.9	1.8
25Oct1977	21:01	1.5	9.0	1708.9	1.8
25Oct1977	21:02	1.5	9.0	1708.9	1.8
25Oct1977	21:03	1.5	9.0	1708.9	1.8
25Oct1977	21:04	1.5	9.0	1708.9	1.8
25Oct1977	21:05	1.5	9.0	1708.9	1.8
25Oct1977	21:06	1.5	9.0	1708.9	1.8
25Oct1977	21:07	1.5	9.0	1708.9	1.7
25Oct1977	21:08	1.5	9.0	1708.9	1.7
25Oct1977	21:09	1.5	9.0	1708.9	1.7
25Oct1977	21:10	1.5	9.0	1708.9	1.7
25Oct1977	21:11	1.5	9.0	1708.9	1.7
25Oct1977	21:12	1.5	9.0	1708.9	1.7
25Oct1977	21:13	1.5	9.0	1708.9	1.7
25Oct1977	21:14	1.5	9.0	1708.9	1.7
25Oct1977	21:15	1.5	9.0	1708.9	1.7

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25Oct1977	21:16	1.5	9.0	1708.9	1.7
25Oct1977	21:17	1.5	9.0	1708.9	1.7
25Oct1977	21:18	1.5	9.0	1708.9	1.7
25Oct1977	21:19	1.5	9.0	1708.9	1.7
25Oct1977	21:20	1.5	9.0	1708.9	1.7
25Oct1977	21:21	1.5	9.0	1708.9	1.7
25Oct1977	21:22	1.5	9.0	1708.9	1.7
25Oct1977	21:23	1.5	9.0	1708.9	1.7
25Oct1977	21:24	1.5	9.0	1708.9	1.7
25Oct1977	21:25	1.5	9.0	1708.9	1.7
25Oct1977	21:26	1.5	9.0	1708.9	1.7
25Oct1977	21:27	1.5	9.0	1708.9	1.7
25Oct1977	21:28	1.5	9.0	1708.9	1.7
25Oct1977	21:29	1.5	9.0	1708.9	1.7
25Oct1977	21:30	1.5	9.0	1708.9	1.7
25Oct1977	21:31	1.5	9.0	1708.9	1.7
25Oct1977	21:32	1.5	9.0	1708.9	1.7
25Oct1977	21:33	1.5	9.0	1708.9	1.7
25Oct1977	21:34	1.5	9.0	1708.9	1.7
25Oct1977	21:35	1.5	9.0	1708.9	1.7
25Oct1977	21:36	1.5	9.0	1708.9	1.7

25Oct1977	21:37	1.5	9.0	1708.9	1.7
25Oct1977	21:38	1.5	9.0	1708.9	1.7
25Oct1977	21:39	1.5	9.0	1708.9	1.7
25Oct1977	21:40	1.5	9.0	1708.9	1.7
25Oct1977	21:41	1.5	9.0	1708.9	1.7
25Oct1977	21:42	1.5	9.0	1708.9	1.7
25Oct1977	21:43	1.5	9.0	1708.9	1.7
25Oct1977	21:44	1.5	9.0	1708.9	1.7
25Oct1977	21:45	1.5	9.0	1708.9	1.7
25Oct1977	21:46	1.5	9.0	1708.9	1.7
25Oct1977	21:47	1.5	9.0	1708.9	1.7
25Oct1977	21:48	1.5	9.0	1708.9	1.7
25Oct1977	21:49	1.5	9.0	1708.9	1.6
25Oct1977	21:50	1.5	9.0	1708.9	1.6
25Oct1977	21:51	1.5	9.0	1708.9	1.6
25Oct1977	21:52	1.5	9.0	1708.9	1.6
25Oct1977	21:53	1.5	9.0	1708.9	1.6
25Oct1977	21:54	1.5	9.0	1708.9	1.6
25Oct1977	21:55	1.5	9.0	1708.9	1.6
25Oct1977	21:56	1.5	9.0	1708.9	1.6
25Oct1977	21:57	1.5	9.0	1708.9	1.6

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25Oct1977	21:58	1.5	9.0	1708.9	1.6
25Oct1977	21:59	1.5	9.0	1708.9	1.6
25Oct1977	22:00	1.5	9.0	1708.9	1.6
25Oct1977	22:01	1.5	9.0	1708.9	1.6
25Oct1977	22:02	1.5	9.0	1708.9	1.6
25Oct1977	22:03	1.5	9.0	1708.9	1.6
25Oct1977	22:04	1.5	9.0	1708.9	1.6
25Oct1977	22:05	1.5	9.0	1708.9	1.6
25Oct1977	22:06	1.5	9.0	1708.9	1.6
25Oct1977	22:07	1.5	9.0	1708.9	1.6
25Oct1977	22:08	1.5	9.0	1708.9	1.6
25Oct1977	22:09	1.5	9.0	1708.9	1.6
25Oct1977	22:10	1.5	9.0	1708.9	1.6
25Oct1977	22:11	1.5	9.0	1708.9	1.6
25Oct1977	22:12	1.5	9.0	1708.9	1.6
25Oct1977	22:13	1.5	9.0	1708.9	1.6
25Oct1977	22:14	1.5	9.0	1708.9	1.6
25Oct1977	22:15	1.5	9.0	1708.9	1.6
25Oct1977	22:16	1.5	9.0	1708.9	1.6
25Oct1977	22:17	1.5	9.0	1708.9	1.6
25Oct1977	22:18	1.5	9.0	1708.9	1.6

25Oct1977	22:19	1.5	9.0	1708.9	1.6
25Oct1977	22:20	1.5	9.0	1708.9	1.6
25Oct1977	22:21	1.5	9.0	1708.9	1.6
25Oct1977	22:22	1.5	9.0	1708.9	1.6
25Oct1977	22:23	1.5	9.0	1708.9	1.6
25Oct1977	22:24	1.5	9.0	1708.9	1.6
25Oct1977	22:25	1.5	9.0	1708.9	1.6
25Oct1977	22:26	1.5	9.0	1708.9	1.6
25Oct1977	22:27	1.5	9.0	1708.9	1.6
25Oct1977	22:28	1.5	9.0	1708.9	1.6
25Oct1977	22:29	1.5	9.0	1708.9	1.6
25Oct1977	22:30	1.5	9.0	1708.9	1.6
25Oct1977	22:31	1.5	9.0	1708.9	1.6
25Oct1977	22:32	1.5	9.0	1708.9	1.6
25Oct1977	22:33	1.5	9.0	1708.9	1.6
25Oct1977	22:34	1.5	9.0	1708.9	1.6
25Oct1977	22:35	1.4	9.0	1708.9	1.6
25Oct1977	22:36	1.4	9.0	1708.9	1.6
25Oct1977	22:37	1.4	9.0	1708.9	1.6
25Oct1977	22:38	1.4	9.0	1708.9	1.6
25Oct1977	22:39	1.4	9.0	1708.9	1.6

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25Oct1977	22:40	1.4	9.0	1708.9	1.6
25Oct1977	22:41	1.4	9.0	1708.9	1.6
25Oct1977	22:42	1.4	9.0	1708.9	1.6
25Oct1977	22:43	1.4	9.0	1708.9	1.6
25Oct1977	22:44	1.4	9.0	1708.9	1.6
25Oct1977	22:45	1.4	9.0	1708.9	1.5
25Oct1977	22:46	1.4	9.0	1708.9	1.5
25Oct1977	22:47	1.4	9.0	1708.9	1.5
25Oct1977	22:48	1.4	9.0	1708.9	1.5
25Oct1977	22:49	1.4	9.0	1708.9	1.5
25Oct1977	22:50	1.4	9.0	1708.9	1.5
25Oct1977	22:51	1.4	9.0	1708.9	1.5
25Oct1977	22:52	1.4	9.0	1708.9	1.5
25Oct1977	22:53	1.4	9.0	1708.9	1.5
25Oct1977	22:54	1.4	9.0	1708.9	1.5
25Oct1977	22:55	1.4	9.0	1708.9	1.5
25Oct1977	22:56	1.4	9.0	1708.9	1.5
25Oct1977	22:57	1.4	9.0	1708.9	1.5
25Oct1977	22:58	1.4	9.0	1708.9	1.5
25Oct1977	22:59	1.4	9.0	1708.9	1.5
25Oct1977	23:00	1.4	9.0	1708.9	1.5

25Oct1977	23:01	1.4	9.0	1708.9	1.5
25Oct1977	23:02	1.4	9.0	1708.9	1.5
25Oct1977	23:03	1.4	9.0	1708.9	1.5
25Oct1977	23:04	1.4	9.0	1708.9	1.5
25Oct1977	23:05	1.4	9.0	1708.9	1.5
25Oct1977	23:06	1.4	9.0	1708.9	1.5
25Oct1977	23:07	1.4	9.0	1708.9	1.5
25Oct1977	23:08	1.4	9.0	1708.9	1.5
25Oct1977	23:09	1.4	9.0	1708.9	1.5
25Oct1977	23:10	1.4	9.0	1708.9	1.5
25Oct1977	23:11	1.4	9.0	1708.9	1.5
25Oct1977	23:12	1.4	9.0	1708.9	1.5
25Oct1977	23:13	1.4	9.0	1708.9	1.5
25Oct1977	23:14	1.4	9.0	1708.9	1.5
25Oct1977	23:15	1.4	9.0	1708.9	1.5
25Oct1977	23:16	1.4	9.0	1708.9	1.5
25Oct1977	23:17	1.4	9.0	1708.9	1.5
25Oct1977	23:18	1.4	9.0	1708.9	1.5
25Oct1977	23:19	1.4	9.0	1708.9	1.5
25Oct1977	23:20	1.4	9.0	1708.9	1.5
25Oct1977	23:21	1.4	9.0	1708.9	1.5

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25Oct1977	23:22	1.4	9.0	1708.9	1.5
25Oct1977	23:23	1.4	9.0	1708.9	1.5
25Oct1977	23:24	1.4	9.0	1708.9	1.5
25Oct1977	23:25	1.4	9.0	1708.9	1.5
25Oct1977	23:26	1.4	9.0	1708.9	1.5
25Oct1977	23:27	1.4	9.0	1708.9	1.5
25Oct1977	23:28	1.4	9.0	1708.9	1.5
25Oct1977	23:29	1.4	9.0	1708.9	1.5
25Oct1977	23:30	1.4	9.0	1708.9	1.5
25Oct1977	23:31	1.4	9.0	1708.9	1.5
25Oct1977	23:32	1.4	9.0	1708.9	1.5
25Oct1977	23:33	1.4	9.0	1708.9	1.5
25Oct1977	23:34	1.4	9.0	1708.9	1.5
25Oct1977	23:35	1.4	9.0	1708.9	1.5
25Oct1977	23:36	1.4	9.0	1708.9	1.5
25Oct1977	23:37	1.4	9.0	1708.9	1.5
25Oct1977	23:38	1.3	9.0	1708.9	1.5
25Oct1977	23:39	1.3	9.0	1708.9	1.5
25Oct1977	23:40	1.3	9.0	1708.9	1.5
25Oct1977	23:41	1.4	9.0	1708.9	1.5
25Oct1977	23:42	1.4	9.0	1708.9	1.5

25Oct1977	23:43	1.4	9.0	1708.9	1.5
25Oct1977	23:44	1.4	9.0	1708.9	1.5
25Oct1977	23:45	1.4	9.0	1708.9	1.5
25Oct1977	23:46	1.4	9.0	1708.9	1.5
25Oct1977	23:47	1.4	9.0	1708.9	1.5
25Oct1977	23:48	1.4	9.0	1708.9	1.5
25Oct1977	23:49	1.4	9.0	1708.9	1.5
25Oct1977	23:50	1.4	9.0	1708.9	1.5
25Oct1977	23:51	1.4	9.0	1708.9	1.5
25Oct1977	23:52	1.4	9.0	1708.9	1.5
25Oct1977	23:53	1.4	9.0	1708.9	1.5
25Oct1977	23:54	1.4	9.0	1708.9	1.5
25Oct1977	23:55	1.3	9.0	1708.9	1.5
25Oct1977	23:56	1.3	9.0	1708.9	1.5
25Oct1977	23:57	1.3	9.0	1708.9	1.5
25Oct1977	23:58	1.3	9.0	1708.9	1.5
25Oct1977	23:59	1.4	9.0	1708.9	1.5
26Oct1977	00:00	1.4	9.0	1708.9	1.5
26Oct1977	00:01	1.4	9.0	1708.9	1.5
26Oct1977	00:02	1.4	9.0	1708.9	1.5
26Oct1977	00:03	1.3	9.0	1708.9	1.5

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26Oct1977	00:04	1.3	9.0	1708.9	1.5
26Oct1977	00:05	1.3	9.0	1708.9	1.4
26Oct1977	00:06	1.3	9.0	1708.9	1.4
26Oct1977	00:07	1.3	9.0	1708.9	1.4
26Oct1977	00:08	1.3	9.0	1708.9	1.4
26Oct1977	00:09	1.3	9.0	1708.9	1.4
26Oct1977	00:10	1.3	9.0	1708.9	1.4
26Oct1977	00:11	1.2	9.0	1708.9	1.4
26Oct1977	00:12	1.1	9.0	1708.9	1.4
26Oct1977	00:13	1.0	9.0	1708.9	1.4
26Oct1977	00:14	0.9	9.0	1708.9	1.4
26Oct1977	00:15	0.8	9.0	1708.9	1.4
26Oct1977	00:16	0.7	9.0	1708.9	1.4
26Oct1977	00:17	0.6	9.0	1708.8	1.4
26Oct1977	00:18	0.5	9.0	1708.8	1.4
26Oct1977	00:19	0.4	9.0	1708.8	1.4
26Oct1977	00:20	0.4	9.0	1708.8	1.4
26Oct1977	00:21	0.3	9.0	1708.8	1.4
26Oct1977	00:22	0.3	9.0	1708.8	1.3
26Oct1977	00:23	0.3	9.0	1708.8	1.3
26Oct1977	00:24	0.2	9.0	1708.8	1.3

26Oct1977	00:25	0.2	9.0	1708.8	1.3
26Oct1977	00:26	0.2	9.0	1708.8	1.3
26Oct1977	00:27	0.2	9.0	1708.8	1.3
26Oct1977	00:28	0.2	9.0	1708.8	1.3
26Oct1977	00:29	0.2	9.0	1708.8	1.3
26Oct1977	00:30	0.2	9.0	1708.8	1.3

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HEC-HMS Report - XLS stylesheet (simulazione_v_1_EN)
SIMULATION RUN

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R. Maloney @ Griggs & Maloney

AUSA- C ELIZABETHTON
HYDROLOGIC STUDY
12/19/2016
SUMMARY OF RESULTS

Simulation run : "10 Storm"
Description : "Basin: Subbasin C & Met: 10yr 24 hour & Control: Control 1"
Basin Model : "Subbasin C"
Meteorologic Model : "10yr 24 hour"
Control Specification : "Control 1"
Simulation Start : "24Oct1977, 24:00"
Simulation End : "26Oct1977, 00:30"

SUBBASINS TABLE

Name	Drainage Area (sq. miles)	Precipitation (inch)	Loss (inch)	Excess (inch)	Runoff coeff.	Peak Discharge (ft3/s)	Unit Peak Discharge (mc/s/kmq)	Time of Peak	Discharge Volume (acre-feet)
Subbasin-C	0.04	4.80	1.70	3.10	0.65	101.5	2643.23	25Oct1977, 12:00	6.4
Subbasin-F	0.01	4.80	1.88	2.92	0.61	17.2	2752	25Oct1977, 11:58	1.0

REACH TABLE

Name	Drainage Area (sq. miles)	Peak Discharge IN (ft3/s)	Time of Peak IN	Peak Discharge OUT (ft3/s)	Time of Peak OUT	Reduction Coeff.	Discharge Volume (acre-feet)	Discharge Volume (inches)
Reach-1	0.04	101.5	25Oct1977, 12:00	101.5	25Oct1977, 12:07	1	6.4	3.10
DMP to Davis Branc	0.04	52.4	25Oct1977, 12:16	52.4	25Oct1977, 12:17	1	7.0	2.94

h								
Reach -2	0.01	17.2	25Oct1977 , 11:58	17.2	25Oct1977 , 12:03	1	1.0	2.92

Simulation Period

from: 24Oct1977, 24:00
to : 26Oct1977, 00:30

HEC-HMS Report - XLS stylesheet (simulazione_v_1_EN)
SIMULATION RUN

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R. Maloney @ Griggs & Maloney, Inc.

AUSA – ELIZABETHTON
HYDROLOGIC STUDY
12/19/2016

SUMMARY OF RESULTS

Simulation run : "25 Storm"
Description : "Basin: Subbasin C & Met: 25 yr 24 hr & Control: Control 1"
Basin Model : "Subbasin C"
Meteorologic Model : "25 yr 24 hr"
Control Specification : "Control 1"
Simulation Start : "24Oct1977, 24:00"
Simulation End : "26Oct1977, 00:30"

SUBBASINS TABLE

Name	Drainage Area (sq. mile)	Precipitation (in.)	Loss (inches)	Excess (inches)	Runoff coeff.	Peak Discharge (ft3/s)	Unit Peak Discharge (mc/s/kmq)	Time of Peak	Discharge Volume (ac-ft)
Subbasin-C	0.04	5.40	1.76	3.64	0.67	118.8	3093.75	25Oct1977, 12:00	7.4
Subbasin-F	0.01	5.40	1.96	3.44	0.64	20.2	3232	25Oct1977, 11:58	1.1

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REACH TABLE

Name	Drainage Area (sq. mile)	Peak Discharge IN (ft3/s)	Time of Peak IN	Peak Discharge OUT (ft3/s)	Time of Peak OUT	Reduction Coeff.	Discharge Volume (ac-ft)	Discharge Volume (inches)
Reach-1	0.04	118.8	25Oct1977, 12:00	118.8	25Oct1977, 12:07	1	7.4	3.64
DMP 001 to Davis Branch	0.04	61.8	25Oct1977, 12:16	61.8	25Oct1977, 12:17	1	8.2	3.46
Reach-2	0.01	20.2	25Oct1977, 11:58	20.2	25Oct1977, 12:03	1	1.1	3.44

Simulation Period

from: 24Oct1977, 24:00
to : 26Oct1977, 00:30

HEC-HMS Report - XLS stylesheet (bacino_CN_SCS_v_1_EN)
BASIN MODEL
Loss method : CN SCS
Transform method : IUH SCS
Routing method : LAG or MUSKINGUM CUNGE

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AUSA-ELIZABETHTON
HYDROLOGIC STUDY
12/19/2016

SUMMARY OF BASIN DATA

BASIN MODEL: Subbasin C

DESCRIPTION: AUSA Elizabethton Quarry
VERSION: 4.2
UNIT SYSTEM: English

SUBBASINS TABLE

Name	Area (kmq)	Loss method	Impervious (%)	CN	Transform method	SCS lag (min)
Subbasin-C	0.04	SCS	10	79	SCS	7
Subbasin-F	0.01	SCS	0	79	SCS	5

REACHS TABLE - Routing method : LAG

Name	Routing method	Lag (min)

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Reach-1	Lag	7
DMP to Davis Branch	Lag	1
Reach-2	Lag	5

TABLE 2
ELIZABETHTON QUARRY - WEIGHTED CURVE NUMBER (CN)

WATERSHED DESIGNATOR	ACRES	CN	WEIGHTED CN CN (BASIN AC/TOTAL AC)
A	5.4	70	4.9
B	8.7	70	8.0
C	24.6	83	26.7
D	12.0	70	11.0
E	17.8	87	20.2
F	4.0	87	4.5
G	4.1	70	3.7
TOTAL	**76.6**		

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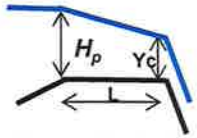
EMERGENCY SPILLWAY FLOW FOR AUSA-ELIZ ETHTON POND 001

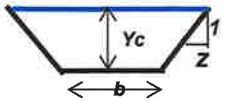
INPUT DESIGN PARAMETERS:

SELECTED BOTTOM WIDTH (b)	=	20.00	ft
SIDE SLOPE (Z)	=	3.00	
LEVEL SECTION LENGTH (L)	=	20.00	ft
ROUGHNESS COEFFICIENT (n)	=	0.040	
SPILLWAY INVERT ELEVATION	=	1718.00	NGVD

25 year - 24 hour storm peak flow, Q
Q_{peak} =61.8



SPILLWAY PROFILE



SPILLWAY CROSS SECTION

OUTPUT:

SELECTED Yc [ft]	Ac [ft²]	T [ft]	Qc [cfs]	Vc [fps]	Hec [ft]	a	Hp [ft]	R [ft]	Sc [ft/ft]	ELEV
0.00			**0.00**							**1718.00**
0.25	5.19	21.50	**14.5**	2.79	0.37	0.02592	0.56	0.24	0.0376	**1718.56**
0.57	12.37	23.42	**51.0**	4.12	0.83	0.00879	0.98	0.52	0.0291	**1718.98**
0.75	16.69	24.50	**78.2**	4.68	1.09	0.00615	1.22	0.67	0.0268	**1719.22**
1.00	23.00	26.00	**122.8**	5.34	1.44	0.00424	1.56	0.87	0.0247	**1719.56**
1.15	26.97	26.90	**153.2**	5.68	1.65	0.00354	1.77	0.99	0.0237	**1719.77**
1.97	51.04	31.82	**366.8**	7.19	2.77	0.00177	2.87	1.57	0.0204	**1720.87**
2.58	71.57	35.48	**576.8**	8.06	3.59	0.00126	3.68	1.97	0.0190	**1721.68**
3.39	102.28	40.34	**924.1**	9.04	4.66	0.00089	4.74	2.47	0.0177	**1722.74**
5.15	182.57	50.90	**1962.0**	10.75	6.94	0.00052	7.02	3.47	0.0159	**1725.02**

Use 2 ft deep by 20 ft wide spillway*

*CRITICAL FLOW EQUATIONS**

(1) $Qc = SQRT(gA^3/T)$,

(2) $Ac = (b + ZYc)Yc$,

(3) $Vc = SQRT(gA/T)$,

(4) $T = b + 2ZYc$

(5) $Hec = Yc + Vc^2/2g$,

(6) $Hp = Hec(1 + aL)$,

(7) $a = (4.32n^2)/Hec^{1.33}$,

(8) $Sc = 14.56n^2A/(R^{1.33})T$,

(9) $R = (b + ZYc)Yc/(b + 2YcSQRT(1 + Z^2))$,

** The Critical Flow Equations were obtained from SCS TR-2 dated 1956 and the Handbook of Hydraulics (Brater & King, 6 ed., page 8-16).*

DEC 2 8 2016

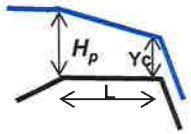
EMERGENCY SPILLWAY FLOW FOR AUSA-ELIZAI THTON SB-1 & SB-2

INPUT DESIGN PARAMETERS:

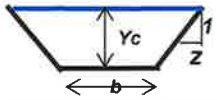
SELECTED BOTTOM WIDTH (b)	=	10.00	ft
SIDE SLOPE (Z)	=	3.00	
LEVEL SECTION LENGTH (L)	=	20.00	ft
ROUGHNESS COEFFICIENT (n)	=	0.040	
SPILLWAY INVERT ELEVATION	=	1724.00	NGVD

25 year - 24 hour storm peak flow, Q

Q_{peak} = 20 cfs



SPILLWAY PROFILE



SPILLWAY CROSS SECTION

OUTPUT:

SELECTED Yc [ft]	Ac [ft²]	T [ft]	Qc [cfs]	Vc [fps]	Hec [ft]	a	Hp [ft]	R [ft]	Sc [ft/ft]	ELEV
0.00			**0.00**							**1724.00**
0.25	2.69	11.50	**7.4**	2.74	0.37	0.02628	0.56	0.23	0.0382	**1724.56**
0.57	6.67	13.42	**26.7**	4.00	0.82	0.00901	0.97	0.49	0.0299	**1724.97**
0.75	9.19	14.50	**41.5**	4.52	1.07	0.00633	1.20	0.62	0.0277	**1725.20**
1.00	13.00	16.00	**66.5**	5.11	1.41	0.00438	1.53	0.80	0.0256	**1725.53**
1.15	15.47	16.90	**84.0**	5.43	1.61	0.00367	1.73	0.90	0.0247	**1725.73**
1.97	31.34	21.82	**213.2**	6.80	2.69	0.00185	2.79	1.40	0.0215	**1726.79**
2.58	45.77	25.48	**348.1**	7.61	3.48	0.00131	3.57	1.74	0.0200	**1727.57**
3.39	68.38	30.34	**582.5**	8.52	4.52	0.00093	4.60	2.17	0.0186	**1728.60**
5.15	131.07	40.90	**1331.4**	10.16	6.75	0.00054	6.83	3.08	0.0167	**1730.83**

*****Use 2 ft deep by 10 ft wide spillway*****

*CRITICAL FLOW EQUATIONS**

(1) $Qc = SQRT(gA^3/T)$,

(2) $Ac = (b + ZYc)Yc$,

(3) $Vc = SQRT(gA/T)$,

(4) $T = b + 2ZYc$

(5) $Hec = Yc + Vc^2/2g$,

(6) $Hp = Hec(1 + aL)$,

(7) $a = (4.32n^2)/Hec^{1.33}$,

(8) $Sc = 14.56n^2A/(R^{1.33})T$,

(9) $R = (b + ZYc)Yc/(b + 2YcSQRT(1 + Z^2))$,

** The Critical Flow Equations were obtained from SCS TR-2 dated 1956 and the Handbook of Hydraulics (Brater & King, 6 ed., page 8-16).*

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