



Brice Engineering LLC
3800 Centerpoint Drive, Suite 417
Anchorage, Alaska 99503
907.275.2912 Phone/Fax

April 22, 2019

Mr. Douglas Simpleman
CENWO-PM-HB
United States Army Corps of Engineers
1616 Capitol Ave
Omaha, NE 68102

RE: Cornhusker Army Ammunition Plant OU1
Contract No.: W9128F-18-D-0020
November 2018 thru January 2019 Analytical Results Summary

Dear Mr. Simpleman:

Attached are summary tables (Attachment 1) of the quarterly sampling analytical results for the period of November 2018 through January 2019 for the Groundwater Treatment Facility (GWTF) at Operable Unit (OU) 1, located in Grand Island, Nebraska. Samples were collected from the total effluent (SP-E1), total influent (SP-S2), granulated activated carbon (GAC) vessels (SP-S6 and SP-S8), and Extraction Well (EW) #7 monitoring points. The sampling was conducted to meet the requirements of the National Pollution Discharge Elimination System (NPDES) Permit, Permit Number NE0131725, and operations and maintenance procedures for the GWTF.

Brice Engineering collected samples for this quarterly sampling event on January 30, 2019. The results verify concentrations for all specified NPDES monitoring parameters are below the NPDES discharge standards and the GWTF is sufficiently treating contaminants of concern prior to discharge. The sampling conducted for this quarter reflect the latest NPDES requirements. We have included a copy of the Daily Chemical Quality Control Report (DCQCR) (Attachment 2) and the NPDES Discharge Monitoring Report (DMR) (Attachment 3) for the period November 2018 through January 2019 for your review.

Also included are summary tables with historical sampling summary table showing data from January 2015 through January 2019 (Attachment 4), and three charts illustrating the historical analytical results from samples collected from EW #7 (Attachment 5).

Please sign the original NPDES forms attached and transmit to Nebraska Department of Environmental Quality.

If you have any questions, please feel free to contact myself or Scotty Mann, Project Manager.

Sincerely,

Gary Carson
Operation Manager - CHAAP Groundwater Treatment Facility
Phone: (308) 379-7542
Email: gcarson@briceeng.com

Attachments:

- Attachment 1 – CHAAP Quarterly Sampling Results Summary – January 2019 (Tables)
- Attachment 2 – Daily Chemical Quality Control Report
- Attachment 3 – NPDES Discharge Monitoring Report
- Attachment 4 – CHAAP Historical Sampling Results Summary – January 2015 – January 2019 (Tables)
- Attachment 5 – Extraction Well #7 Trend Data (Charts)

cc: Corey Schwabenlander, Brice Engineering
Dean Converse, AECOM

ATTACHMENT 1

**CHAAP Quarterly Sampling Results Summary –
January 2019 (Tables)**

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**SP-E1 [TOTAL EFFLUENT]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (January 2019)**

Sample Location Sample Date			SP-E1 1/30/2019	SP-E11 (Duplicate) 1/30/2019
Analyte (Method) (Units)	Anticipated	NPDES Permit		
Explosives (8330A) (µg/L)				
HMX	0.6	200	ND(0.10)	--
RDX	1	50	J 0.14	--
Tetryl	<0.5	Report	ND(0.10)	--
TNT	5.1	Report	ND(0.10)	--
Combined Explosives (TNT+RDX+Tetryl)	7.2	100	J 0.14	--
VOCs (8260B) (µg/L)				
Trichloroethylene	NN	5	ND(0.4)	--
Trichlorotrifluoroethane	0.9	500	ND(0.8)	--
Metals (6020A) (µg/L)				
Selenium	3	5	J 1.2	J 1.5
pH (9040C) (s.u.)	NN	6.5 - 9.0	7.4	--

Notes:

Anticipated = The anticipated value was established when the Groundwater Treatment Facility (GWTF) went in to operation.

NPDES Permit = Permitted concentration on NPDES permit.

Report = Indicates concentrations are reported on NPDES Discharge Monitoring Report (DMR).

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

pH = Field parameter with a holding time of 15 minutes

Combined explosives for the effluent sample at SP-E1 are reported in the NPDES permit and are calculated as (TNT+RDX+Tetryl)

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.

NN = Not noted

M = Manual Integrated compound.

QC = Quality Control Sample

(µg/L) = micrograms per liter

(s.u.) = standard units

Sample ID: SP = Sampling Port, E=Effluent, n=port number

SP-E1 = Bottom of Effluent Tank

SP-S2 [TOTAL INFLUENT]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (January 2019)
QC

Sample Location Sample Date		SP-S2 1/30/2019	SP-S22 (Duplicate) 1/30/2019
Analyte (Method) (Units)	Max Expected		
Explosives (8330A) (µg/L)			
HMX	50	0.46	0.43
RDX	100	J 0.61	0.59
Tetryl	NN	ND(0.10)	ND(0.10)
TNT	250	6.6	6.4
VOCs (8260B) (µg/L)			
Trichloroethylene	NN	ND(0.4)	ND(0.4)
Trichlorotrifluoroethane	NN	ND(0.8)	ND(0.8)
TSS (2540D) (mg/L)			
	NN	ND(2.8)	ND(2.8)
pH (9040C) (s.u.)			
	NN	7.9	7.8

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when went Groundwater Treatment Facility (GWTF) went in to operation.

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

TNT = 2,4,6-trinitrotoluene

VOC's = Volatile Organic Compounds

TSS = total suspended solids

pH = Field parameter with a holding time of 15 minutes

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

NN = Not noted

M = Manual Integrated compound

QC = Quality Control Sample

(µg/L) = micrograms per liter

(s.u.) = standard units

Sample ID: SP = Sampling Port, S=Source, n=port number

SP-S22 is duplicate sample

SP-S2 = Discharge of GAC Feed Tank

**SP-S6 [LEAD GAC VESSEL]
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (January 2019)**

Sample Location Sample Date	SP-S6 1/30/2019
Analyte (Method) (Units)	
Explosives (8330A) (µg/L)	
HMX	0.2
RDX	0.36
Tetryl	ND(0.10)
TNT	0.81

SP-S8 [LAG GAC VESSEL]

CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (January 2019)

E-1-QC

Sample Location Sample Date	SP-S8 1/30/2019	SP-E1 1/30/2019
Analyte		
Explosives (8330A) (µg/L)		
HMX	ND(0.10)	ND(0.10)
RDX	J 0.11	J 0.13
Tetryl	ND(0.10)	ND(0.10)
TNT	ND(0.10)	ND(0.10)

Notes:

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value.

M = Manual Integrated compound.

E-1-QC = Quality Control Sample taken from the E-1 sample

(µg/L) = micrograms per liter

Sample ID: SP = Sampling Port, S=Source, n=port number

SP-S6 = Discharge of Lead GAC Unit

SP-S8 = Discharge of Lag GAC Unit

EXTRACTION WELL #7
CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (January 2019)

Sample Location Sample Date		EW#7 1/30/2019
Analyte (Method) (Units)	Max Expected	
Explosives (8330A) (µg/L)		
HMX	50	0.46
RDX	100	J 0.61
Tetryl	NN	ND(0.10)
TNT	250	6.6
VOCs (8260B) (µg/L)		
Trichloroethylene	NN	ND(0.4)
Trichlorotrifluoroethane	NN	ND(0.8)

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when Groundwater Treatment Facility (GWTF) went in to operation.

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

VOC's = Volatile Organic Compounds

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

M = Manual Integrated compound

NN = Not noted

Effective 3/31/2010, EW #7 samples were collected from inside the GWTF; same as SP-S2

EW #7 only well online.

Sample ID: EW=Extraction Well, n=Well Number

ATTACHMENT 2

Daily Chemical Quality Control Report

Brice Engineering Daily Chemical Quality Control Report

COE Project Manager Doug Simpleman Date January 30, 2019 Report No. **405**

CHAAP QUARTERLY SAMPLING RESULTS SUMMARY (July 2018)

Project	<u>CHAAP NPDES Sampling</u>	Day	M	T	W	TH	F	S	SUN
					X				

Brice Eng. Project No. 1430057.0001.001

Contract No. W9128F-18-D-0020

Subcontractors on site: None

On Site Hours	1
Travel Time	0
Office Time	1

Equipment on site: None

Weather	Bright Sun	Clear	Overcast	Rain	Snow
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Visitors on site: None

Temp	<32	32-50	50-70	70-85	85>
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Personnel on site: Gary Carson

Wind	Still	Moderate	High
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Humidity	Dry	Moderate	Humid
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Field Work Performed (including sampling):

SP-S2 & SP-S22 = VOCs, pH, TSS & Explosives
 SP-S6 = Explosives
 SP-S8 = Explosives
 SP-E1 = pH, Selenium, VOCs, & Explosives; SP-E11 = Selenium
 SP-EW7 = VOCs & Explosives (Collected from inside GWTF; same as SP-S2)

Note: Weather, Temp, Wind, and Humidity were not documented because samples were collected inside the Groundwater Treatment Facility (GWTF).

Quality Control Activities (including field calibration):

None.

Health and Safety Activities

None.

Problems Encountered/Corrective Action Taken

None.

Downtime/Standby:

Not applicable.

Office Work Performed:

Sample labeling, Chain of Custody, DCQCR

By: Gary Carson
 Reviewed By: Scotty Mann

Title: Plant Operator
 Title: Project Manager

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ATTACHMENT 3

NPDES Discharge Monitoring Report

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: CORNHUSKER ARMY AMMUNITION PLT
ADDRESS: 102 N 60TH RD
 GRAND ISLAND, NE 68803
FACILITY: CORNHUSKER ARMY AMMUNITION PLT
LOCATION: 102 N 60TH RD
 GRAND ISLAND, NE 68803
ATTN: Doug Simpleman, PROJECT MANAGER

NE0131725
PERMIT NUMBER

002M
DISCHARGE NUMBER

DMR MAILING ZIP CODE: 68803
 MINOR
 (SUBR05)
 TREATED GROUND WATER
 External Outfall

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
18	11	01	FROM	19	01	31
			TO			

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
pH 00400 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****			*****		(12)			
	PERMIT REQUIREMENT	*****	*****		6.5 MINIMUM	*****	9 MAXIMUM	SU		Semiannual	GRAB
Selenium, total (as Se) 01147 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
	PERMIT REQUIREMENT	*****	*****		*****	.005 AVERAGE	.02 MAXIMUM	mg/L		Semiannual	GRAB
Trichloroethylene 39180 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	.005 MAXIMUM	mg/L		Semiannual	GRAB
Flow, in conduit or thru treatment plant 50050 1 0 Effluent Gross	SAMPLE MEASUREMENT			(03)	*****	*****	*****				
	PERMIT REQUIREMENT	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	Mgal/d	*****	*****	*****			Daily	CALCTD
Explosives, combined TNT + RDX + tetryl 78455 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
	PERMIT REQUIREMENT	*****	*****		*****	.1 AVERAGE	.2 MAXIMUM	mg/L		Semiannual	GRAB
TNT, total 81360 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	mg/L		Semiannual	GRAB
RDX, total 81364 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
	PERMIT REQUIREMENT	*****	*****		*****	.05 AVERAGE	.1 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Doug Simpleman, Project Manager TYPED OR PRINTED	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.	TELEPHONE		DATE		
		(402) 995-2753				
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
 OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

Page 2

NAME: CORNHUSKER ARMY AMMUNITION PLT
ADDRESS: 102 N 60TH RD
 GRAND ISLAND, NE 68803
FACILITY: CORNHUSKER ARMY AMMUNITION PLT
LOCATION: 102 N 60TH RD
 GRAND ISLAND, NE 68803
ATTN:Doug Simpleman PROJECT MANAGER

NE0131725	002M
PERMIT NUMBER	DISCHARGE NUMBER

DMR MAILING ZIP CODE: 68803
 MINOR
 (SUBR05)
 TREATED GROUND WATER
 External Outfall

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
18	11	01	FROM	19	01	31
			TO			

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Trichlorotrifluoroethane	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
81611 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	.02 MAXIMUM	mg/L		Semiannual	GRAB
HMX	SAMPLE MEASUREMENT	*****	*****		*****			(19)			
82203 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****		*****	.2 AVERAGE	.4 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Doug Simpleman, Project Manager TYPED OR PRINTED	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.	TELEPHONE		DATE		
		(402) 995-2753				
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

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DMR MAILING ZIP CODE: 68803
MINOR
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TREATED GROUND WATER
External Outfall

MONITORING PERIOD						
FROM	MO	DAY	TO	YEAR	MO	DAY
	18	11	01	19	01	31

No Discharge

ATTN:Doug Simpleman, PROJECT MANAGER

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
pH 00400 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		7.4	*****	7.4	(12)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		6.5 MINIMUM	*****	9 MAXIMUM	SU		Semiannual	GRAB
Selenium, total (as Se) 01147 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	0.0015	0.0015	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	.005 AVERAGE	.02 MAXIMUM	mg/L		Semiannual	GRAB
Trichloroethylene 39180 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	<0.0004	<0.0004	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	.005 MAXIMUM	mg/L		Semiannual	GRAB
Flow, in conduit or thru treatment plant 50050 1 0 Effluent Gross	SAMPLE MEASUREMENT	0.418	0.445	(03)	*****	*****	*****				
	PERMIT REQUIREMENT	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	Mgal/d	*****	*****	*****			Daily	CALCTD
Explosives, combined TNT + RDX + tetryl 78455 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	0.00014	0.00014	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	.1 AVERAGE	.2 MAXIMUM	mg/L		Semiannual	GRAB
TNT, total 81360 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	<0.00010	<0.00010	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	Req. Mon. MAXIMUM	mg/L		Semiannual	GRAB
RDX, total 81364 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	0.00014	0.00014	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	.05 AVERAGE	.1 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Doug Simpleman, Project Manager TYPED OR PRINTED	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.	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE		DATE		
			(402)995-2753	AREA Code	NUMBER	YEAR	MO

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

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PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

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 GRAND ISLAND, NE 68803
 ATTN:Doug Simpleman, PROJECT MANAGER

NE0131725	001M
PERMIT NUMBER	DISCHARGE NUMBER

DMR MAILING ZIP CODE: 68803
 MINOR
 (SUBR05)
 TREATED GROUND WATER
 External Outfall

MONITORING PERIOD						
YEAR	MO	DAY		YEAR	MO	DAY
18	11	01	FROM	19	01	31
			TO			

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Trichlorotrifluoroethane 81611 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	<0.0008	<0.0008	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	Req. Mon. AVERAGE	.02 MAXIMUM	mg/L		Semiannual	GRAB
HMX 82203 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****		*****	<0.00010	<0.00010	(19)		1/90	Grab
	PERMIT REQUIREMENT	*****	*****		*****	.2 AVERAGE	.4 MAXIMUM	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Doug Simpleman, Project Manager	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.	TELEPHONE		DATE					
		(402) 995-2753							
TYPED OR PRINTED		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT			AREA Code	NUMBER	YEAR	MO	DAY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

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ATTACHMENT 4

**CHAAP Historical Sampling Results Summary –
January 2015 – January 2019 (Tables)**

**SP-E1 (TOTAL EFFLUENT)
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - January 2019)**

	Explosives						VOC's		Metals	pH
	HMX	RDX	Tetryl	TNT	Combined Explosives	Total Explosives	Trichloro-ethylene	Trichloro-trifluoromethane	Selenium	
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
Anticipated	0.6	1	<0.5	5.1	7.2	NN	--	0.9	3	(s.u.) NN
Permit	200	50	Report	Report	100	NN	5 µg/L	500	5	6.5 - 9.0
SAMPLE DATE										
1/28/2015	ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	ND	ND	ND(0.2)	3.4	J 5.2	QC 7.82
1/28/2015									ND(12)	
4/29/2015	ND(0.20)	J 0.14	ND(0.20)	ND(0.20)	0.14	0.14	ND(0.4)	J 2.8	ND(19)	QC 7.28
4/29/2015									J 5.8	QC
7/29/2015	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	ND	ND	ND(0.4)	ND(1.6)	ND(19)	QC 7.11
7/29/2015									ND(19)	QC
10/28/2015	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	ND	ND	ND(0.4)	J 1	J 13	QC 7.10
10/28/2015									J 9.9	QC
1/27/2016	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	J 1.2	J 9.9	QC 7.30
1/27/2016									ND(19)	QC
4/27/2016	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	J 1.1	ND(19)	QC 7.23
4/27/2016									ND(19)	QC
7/27/2016	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	ND	ND	ND(0.4)	J 1.6	ND(19)	QC 7.10
7/27/2016									ND(19)	QC
10/26/2016	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	ND	ND	ND(0.4)	J 1.4	ND(19)	QC 7.2
10/26/2016									ND(19)	QC
1/25/2017	ND(0.21)	J 0.18	J 0.18	ND(0.21)	0.36	0.36	ND(0.4)	J 1.2	ND(19)	QC 7.5
1/25/2017									ND(19)	QC
4/26/2017	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	ND	ND	ND(0.4)	J 1.1	ND(19)	QC 7.5
4/26/2017									ND(19)	QC
7/26/2017	UJ ND(0.23)	UJ ND(0.14)	UJ ND(0.23)	UJ ND(0.23)	ND	ND	ND(0.4)	JQ 1.2	ND(19)	QC 7.4
7/26/2017									ND(19)	QC
10/25/2017	ND(0.21)	J 0.16	ND(0.21)	ND(0.21)	0.16	0.16	ND(0.4)	J 1.3	ND(19)	QC 7.3
10/25/2017									ND(19)	QC
1/31/2018	JJ1 0.045	J 0.14	ND(0.10)	ND(0.10)	0.14	0.19	ND(0.4)	ND (1.6)	J 1.7	QC 7.5
1/31/2018									J 1.9	QC
4/25/2018	J 0.077	J 0.12	ND(0.11)	M ND(0.11)	0.12	0.20	ND(0.4)	ND (1.6)	J 1.4	QC 7.3
4/25/2018									J 1.4	QC
7/25/2018	JM 0.045	JM 0.10	ND(0.099)	ND(0.099)	0.10	0.15	ND(0.4)	ND (1.6)	J 1.4	QC 7.2
7/25/2018									J 1.4	QC
10/31/2018	ND(0.10)	J 0.13	ND(0.10)	ND(0.10)	0.13	0.13	ND(0.4)	J 0.71	J 1.1	QC 7.5
10/31/2018									J 1.4	QC
1/30/2019	ND(0.10)	J 0.14	ND(0.10)	ND(0.10)	0.14	0.14	ND(0.4)	J ND (1.6)	J 1.2	QC 7.4
1/30/2019									J 1.5	QC

Notes:

Anticipated = The anticipated value was established when the Groundwater Treatment Facility (GWTF) went in to operation

Permit = Permitted concentration on NPDES permit

Report = Indicates concentrations only need reported on NPDES Discharge Monitoring Report (DMR)

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

pH = Field parameter with a holding time of 15 minutes

Combined explosives for the effluent sample at SP-E1 are reported in the NPDES permit and are calculated as (TNT+RDX+Tetryl)

Total explosives are calculated for operation evaluations as (TNT+RDX+Tetryl+HMX)

Blank cell indicates not analyzed

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value

J1 = Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

M = Manual Integrated compound

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

NN = Not Noted

Q = One or more quality control criteria failed

UJ = Estimated Non-detect

QC = Quality Control Sample

(µg/L) = micrograms per liter

(s.u.) = standard units

Method 8330A used for explosives

Method 8260B used for VOCs

Method 6020A for metals since 1/31/2018. Method 7740 used for metals prior to 1/31/2018

Method 9040C used for pH since 1/31/2018. Method 150.1 used for pH prior to 1/31/2018

Sample ID: SP = Sampling Port, E=Effluent, n=port number

SP-E1 = Bottom of Effluent Tank

SP-S2 (TOTAL INFLUENT)
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - January 2019)

SAMPLE DATE		Explosives				VOC's		TSS	pH
		HMX	RDX	Tetryl	TNT	Trichloro-ethylene	Trichloro-trifluoromethane		
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		
Max Expected		50	100	NN	250	NN	NN	NN	(s.u.) NN
1/28/2015		J 0.37	1.1	ND(0.16)	10	ND(0.2)	4.6	ND(2.8)	7.5
1/28/2015	QC	J 0.42	1.2	ND(0.16)	10	ND(0.2)	4.2	ND(2.8)	7.47
4/29/2015		J 0.43	1.1	ND(0.21)	9.8	ND(0.4)	3.6	ND(2.8)	7.39
4/29/2015	QC	J 0.41	1.0	ND(0.21)	10	ND(0.4)	3.6	ND(2.8)	7.47
7/29/2015		J 0.47	0.92	ND(0.20)	9.4	ND(0.4)	J 2.7	J 3.2	7.11
7/29/2015	QC	JB 1.50	0.91	ND(0.20)	9.4	ND(0.4)	J 2.5	J 2.4	7.12
10/28/2015		J 0.37	0.92	ND(0.20)	11	ND(0.4)	J 2.3	ND(2.8)	7.1
10/28/2015	QC	J 0.38	0.89	ND(0.20)	11	ND(0.4)	J 2.3	ND(2.8)	7.1
1/27/2016		ND(0.21)	0.72	ND(0.21)	11	ND(0.4)	J 2.1	J 1.2	7.09
1/27/2016	QC	ND(0.21)	0.74	ND(0.21)	11	ND(0.4)	J 2.2	ND(2.8)	7.08
4/27/2016		0.66	B 0.97	ND(0.21)	7.5	ND(0.4)	J 1.7	J 1.2	7.13
4/27/2016	QC	0.73	B 1.0	ND(0.21)	7.7	ND(0.4)	J 1.6	ND(2.8)	7.23
7/27/2016		J 0.81	J 0.83	ND(0.22)	9.0	ND(0.4)	J 1.6	ND(2.8)	7.13
7/27/2016	QC	0.81	0.74	ND(0.22)	9.1	ND(0.4)	J	ND(2.8)	7.09
10/26/2016		1.0	0.96	ND(0.23)	9.2	ND(0.4)	J 1.4	ND(2.8)	7.4
10/26/2016	QC	0.91	0.78	ND(0.23)	9.3	ND(0.4)	J 1.5	J 1.2	7.4
1/25/2017		J 0.68	Q 0.70	ND(0.21)	Q 8.7	ND(0.4)	J 1.5	ND(2.8)	7.7
1/25/2017	QC	J 0.62	Q 0.71	ND(0.21)	Q 8.8	ND(0.4)	J 1.3	ND(2.8)	7.8
4/26/2017		J 0.36	0.33	ND(0.21)	7.5	ND(0.4)	J 1.1	ND(2.8)	7.7
4/26/2017	QC	J 0.34	0.32	ND(0.21)	7.4	ND(0.4)	J 1.1	ND(2.8)	7.7
7/26/2017		0.48	0.64	ND(0.21)	6.3	ND(0.4)	JQ 1.1	ND(2.8)	7.7
7/26/2017	QC	J 0.5	0.57	ND(0.21)	6.6	ND(0.4)	1.1	ND(2.8)	7.7
10/25/2017		J 0.34	0.66	ND(0.23)	5.9	ND(0.4)	J 1.3	J 1.6	7.7
10/25/2017	QC	0.59	0.67	ND(0.21)	6.5	ND(0.4)	J 1.2	J 1.6	7.6
1/31/2018		0.54	0.56	ND(0.10)	7.0	ND(0.4)	ND(1.6)	ND(3.5)	7.7
1/31/2018	QC	0.56	0.62	ND(0.10)	7.0	ND(0.4)	ND(1.6)	ND(3.5)	7.8
4/25/2018		0.54	M 0.52	M ND(0.11)	6.4	ND(0.4)	ND(1.6)	J 1.2	7.3
4/25/2018	QC	0.51	0.53	M ND(0.11)	6.5	ND(0.4)	ND(1.6)	ND(2.8)	7.4
7/25/2018		M 0.47	M 0.53	ND(0.099)	M 6.0	ND(0.4)	ND(1.6)	ND(2.8)	7.1
7/25/2018	QC	M 0.48	M 0.53	ND(0.10)	6.1	ND(0.4)	ND(1.6)	ND(2.8)	7.4
10/31/2018		0.42	0.58	ND(0.10)	7.0	ND(0.4)	ND(1.6)	ND(2.8)	7.9
10/31/2018	QC	0.39	0.48	ND(0.10)	6.9	ND(0.4)	ND(1.6)	ND(2.8)	7.9
1/30/2019		0.46	J 0.61	ND(0.10)	6.6	ND(0.4)	ND(1.6)	ND(2.8)	7.9
1/30/2019	QC	0.43	0.59	ND(0.10)	6.4	ND(0.4)	ND(1.6)	ND(2.8)	7.8

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when the Groundwater Treatment Facility (GWTF) went in to operation

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

VOC's = Volatile Organic Compounds

TSS = Total Suspended Solids

pH = Field parameter with a holding time of 15 minutes

GAC = Granulated Activated Carbon

Blank cell indicates not analyzed

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value

B = Compound was found in the blank and sample

NN = Not Noted

M = Manual Integrated compound

Q = One or more quality control criteria failed

QC = Quality Control Sample

(µg/L) = micrograms per liter

(mg/L) = milligrams per liter

(s.u.) = standard units

Method 8330A used for explosives

Method 8260B used for VOCs

Method 2540D used for TSS since 1/31/2018. Method 160.2 used for TSS prior to 1/31/2018

Method 9040C used for pH since 1/31/2018. Method 150.1 used for pH prior to 1/31/2018

Sample ID: SP = Sampling Port, S=Source, n=port number

SP-S2 = Discharge of GAC Feed Tank

**SP-S6 & SP-S8
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - January 2019)**

SAMPLE DATE	SP-S6 Lead GAC Unit				SP-S8 Lag GAC Unit				
	Explosives				Explosives				
	HMX (µg/L)	RDX (µg/L)	Tetryl (µg/L)	TNT (µg/L)	HMX (µg/L)	RDX (µg/L)	Tetryl (µg/L)	TNT (µg/L)	
1/28/2015	ND(0.15)	0.48	ND(0.15)	1.4	ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	
1/28/2015					ND(0.15)	ND(0.15)	ND(0.15)	ND(0.15)	E-1-QC
4/29/2015	J 0.22	0.54	ND(0.20)	1.5	ND(0.20)	J 0.13	ND(0.20)	ND(0.20)	
4/29/2015					ND(0.20)	J 0.14	ND(0.20)	ND(0.20)	E-1-QC
7/29/2015	ND(0.20)	J 0.17	ND(0.20)	J 0.24	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	
7/29/2015					ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	E-1-QC
10/28/2015	ND(0.20)	J 0.17	ND(0.20)	J 0.24	ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	
10/28/2015					ND(0.20)	ND(0.12)	ND(0.20)	ND(0.20)	E-1-QC
1/27/2016	ND(0.21)	J 0.20	ND(0.21)	0.61	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	
1/27/2016					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
4/27/2016	ND(0.21)	B 0.46	ND(0.21)	0.62	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	
4/27/2016					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
7/27/2016	ND(0.22)	0.30	ND(0.22)	0.51	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	
7/27/2016					ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	E-1-QC
10/26/2016	ND(0.22)	0.39	ND(0.22)	0.89	ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	
10/26/2016					ND(0.22)	ND(0.13)	ND(0.22)	ND(0.22)	E-1-QC
1/25/2017	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	ND(0.21)	ND(0.12)	ND(0.21)	ND(0.21)	
1/25/2017					ND(0.21)	J 0.18	J 0.18	ND(0.21)	E-1-QC
4/26/2017	J 0.21	0.27	ND(0.21)	1.1	ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	
4/26/2017					ND(0.21)	ND(0.13)	ND(0.21)	ND(0.21)	E-1-QC
7/26/2017	J 0.13	0.36	ND(0.21)	1.1	ND(0.21)	J 0.11	ND(0.21)	ND(0.21)	
7/26/2017					UJ ND(0.23)	UJ ND(0.14)	UJ ND(0.23)	UJ ND(0.23)	E-1-QC
10/25/2017	ND(0.23)	0.34	ND(0.23)	1.1	ND(0.21)	J 0.14	ND(0.21)	ND(0.21)	
10/25/2017					ND(0.21)	J 0.16	UJ ND(0.21)	UJ ND(0.21)	E-1-QC
1/31/2018	0.21	0.33	ND(0.10)	0.78	J 0.048	J 0.13	ND(0.10)	ND(0.10)	
1/31/2018					J 0.045	J 0.14	ND(0.10)	ND(0.10)	E-1-QC
4/25/2018	0.20	M 0.28	M ND(0.10)	0.63	J ND(0.10)	JM 0.13	M ND(0.10)	M ND(0.10)	
4/25/2018					J 0.077	J 0.12	ND(0.11)	M ND(0.11)	E-1-QC
7/25/2018	M 0.18	M 0.29	ND(0.099)	0.51	J 0.039	J 0.10	ND(0.10)	ND(0.10)	
7/25/2018					J 0.045	J 0.10	ND(0.099)	ND(0.099)	E-1-QC
10/31/2018	0.15	0.36	ND(0.10)	0.74	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	
10/31/2018					ND(0.10)	J 0.13	ND(0.10)	ND(0.10)	E-1-QC
1/30/2019	0.20	0.36	ND(0.10)	0.81	ND(0.10)	J 0.11	ND(0.10)	ND(0.10)	
1/30/2019					ND(0.10)	J 0.14	ND(0.10)	ND(0.10)	E-1-QC

Notes:

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
TNT = 2,4,6-trinitrotoluene
GAC = Granulated Activated Carbon
Blank cell indicates not analyzed
E-1-QC = Quality Control Sample taken from the E-1 sample
ND = Not Detected (values in parenthesis represent limits of detection [LOD])
J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value
B = Compound was found in the blank and sample
UJ = Estimated Non-detect
M = Manual Integrated compound
(µg/L) = micrograms per liter
Method 8330A used for explosives
Sample ID: SP = Sampling Port, S=Source, n=port number
SP-S6 = Discharge of Lead GAC Unit
SP-S8 = Discharge of Lag GAC Unit

CY06 Carbon Changes: March 15, 2006; July 18, 2006; December 7, 2006
CY07 Carbon Changes: April 5, 2007; August 21, 2007, December 10, 2007
CY08 Carbon Changes: September 30, 2008
CY09 Carbon Changes: July 23, 2009
CY10 Carbon Changes: November 30, 2010
CY12 Carbon Changes: February 8, 2012
CY13 Carbon Changes: October 9, 2013
CY15 Carbon Changes: May 11, 2015

EXTRACTION WELL EW#7
CHAAP SAMPLING RESULTS SUMMARY (January 2015 - January 2019)

		Explosives					VOC's	
		HMX (µg/L)	RDX (µg/L)	Tetryl (µg/L)	TNT (µg/L)	Total Explosives (µg/L)	Trichloro-ethylene (µg/L)	Trichloro- trifluoroethane (µg/L)
Well ID	Max Expected	50	100	NN	250	NN	NN	NN
	Sample Date							
EW#7	1/28/2015	J 0.37	1.1	ND(0.16)	10	11	ND(0.2)	4.6
EW#7	4/29/2015	J 0.43	1.1	ND(0.21)	9.8	11	ND(0.4)	3.6
EW#7	7/29/2015	J 0.47	0.92	ND(0.20)	9.4	11	ND(0.4)	J 2.7
EW#7	10/28/2015	J 0.37	0.92	ND(0.20)	11	12	ND(0.4)	J 2.3
EW#7	1/27/2016	ND(0.21)	0.72	ND(0.21)	11	12	ND(0.4)	J 2.1
EW#7	4/27/2016	B 0.66	0.97	ND(0.21)	7.5	9	ND(0.4)	J 1.7
EW#7	7/27/2016	J 0.81	J 0.83	ND(0.22)	9.0	11	ND(0.4)	J 1.6
EW#7	10/26/2016	1.0	0.96	ND(0.23)	9.2	11	ND(0.4)	J 1.4
EW#7	1/25/2017	J 0.68	Q 0.70	ND(0.21)	Q 8.7	10	ND(0.4)	J 1.5
EW#7	4/26/2017	J 0.36	0.33	ND(0.21)	7.5	8	ND(0.4)	J 1.1
EW#7	7/26/2017	0.48	0.64	ND(0.21)	6.3	7	ND(0.4)	J 1.1
EW#7	10/25/2017	J 0.34	0.66	ND(0.23)	5.9	7	ND(0.4)	J 1.3
EW#7	1/31/2018	0.54	0.56	ND(0.10)	7.0	8	ND(0.4)	ND(1.6)
EW#7	4/25/2018	0.54	M 0.52	M ND(0.11)	6.4	7	ND(0.4)	ND(1.6)
EW#7	7/25/2018	M 0.47	M 0.53	ND(0.099)	M 6.0	7	ND(0.4)	ND(1.6)
EW#7	10/31/2018	0.42	0.58	ND(0.10)	7.0	8	ND(0.4)	ND(1.6)
EW#7	1/30/2019	0.46	J 0.61	ND(0.10)	6.6	8	ND(0.4)	ND(1.6)

Notes:

Max Expected = The maximum expected values with one extraction well operating; values established when the Groundwater Treatment Facility (GWTF) went in to operation

HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

TNT = 2,4,6-trinitrotoluene

Total explosives are calculated for operation evaluations as (TNT+RDX+Tetryl+HMX)

VOC's = Volatile Organic Compounds

ND = Not Detected (values in parenthesis represent limits of detection [LOD])

J = Result is less than the RL but greater than or equal to the limits of detection (LOD) and the concentration is an approximate value

B = Compound was found in the blank and sample.

M = Manual Integrated compound.

Q = One or more quality control criteria failed

NN = Not Noted

N/A = Not Applicable

(µg/L) = micrograms per liter

Method 8330A used for explosives

Method 8260B used for VOCs

Sample ID: EW=Extraction Well, n=Well Number

Effective 3/31/2010, EW #7 samples were collected from inside the Groundwater Treatment Facility (GWTF); same as SP-S2

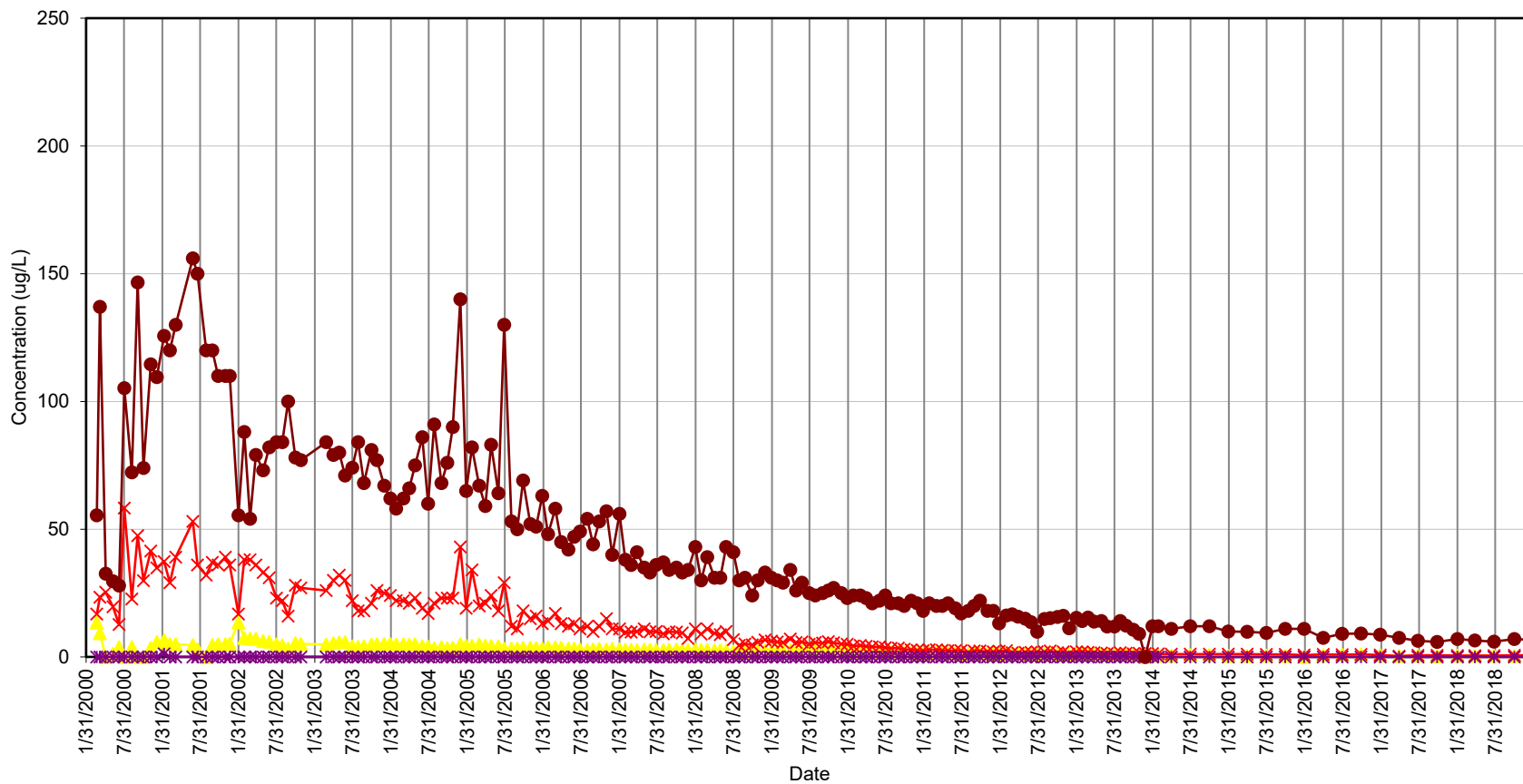
EW #7 only well online

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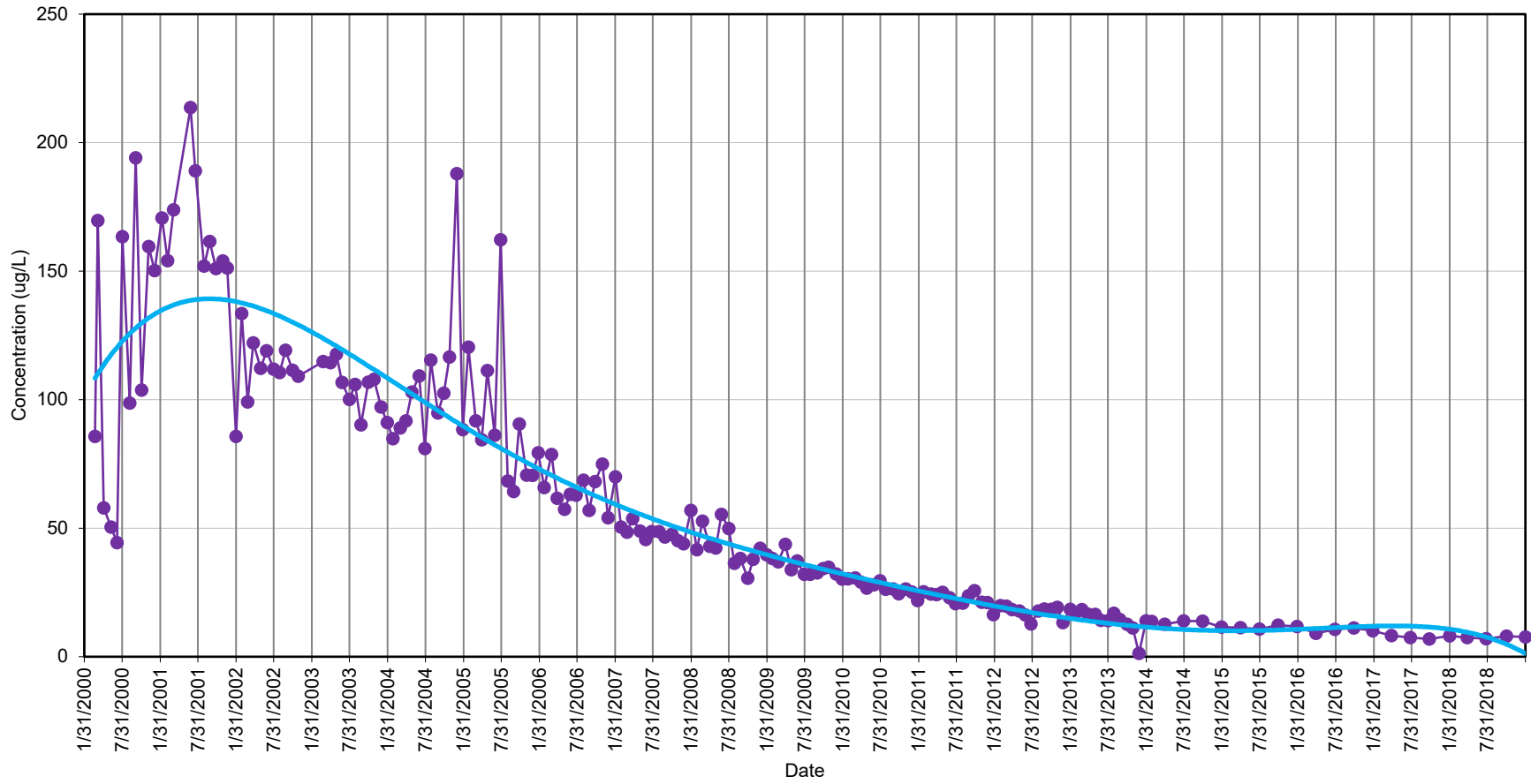
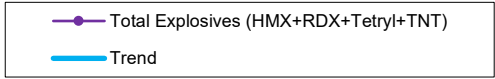
ATTACHMENT 5

Extraction Well #7 Trend Data (Charts)

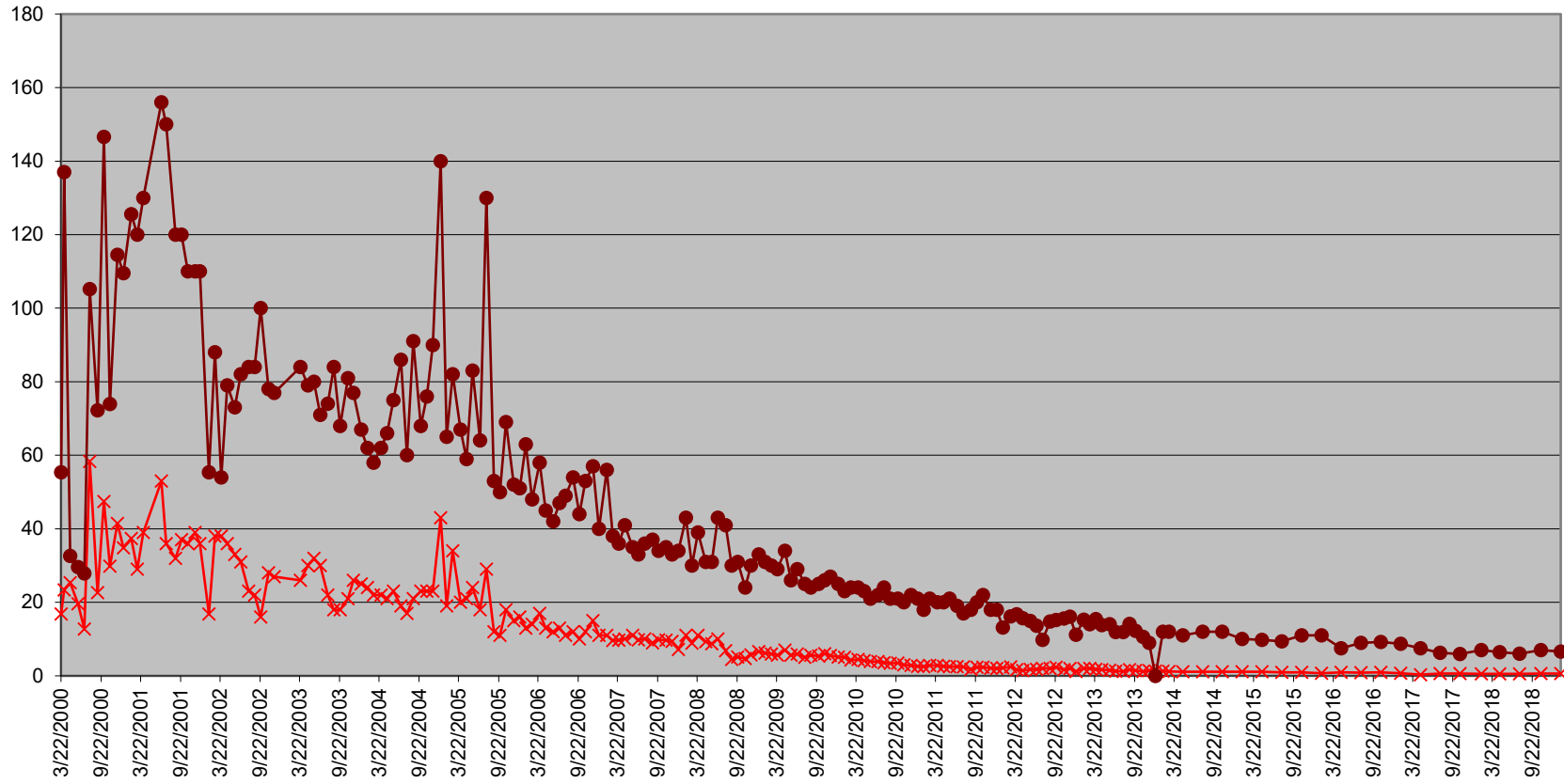
Extraction Well EW #7



Extraction Well EW #7



EW #7



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