State of Nevada
Department of Conservation
and Natural Resources
Division of Environmental Protection

Groundwater Discharge Program

FOR BWPC USE ONLY:	
Check No.:	
Receipt No.:	
Amount:	$

GROUNDWATER DISCHARGE PERMIT APPLICATION

☐ APPLICATION – NEW ☒ APPLICATION – RENEWAL ☐ APPLICATION – MODIFICATION

PERMIT NUMBER: NEV 96021 (LEAVE BLANK IF NEW PERMIT)

1. OWNER/RESPONSIBLE PARTY INFORMATION:

Business/Agency Name:	National Nuclear Security Administration / Nevada Field Office		
Contact Person:	David R. Bowman, PhD	Phone Number:	(702) 295-3211
Mailing Address:	P.O. Box 98518	Fax Number:	N/A
City:	Las Vegas County: Clark	State: NV	Zip Code: 89193-8518
Email Address:	david.bowman@nnsa.doe.gov		
Federal Tax ID No.:	N/A		

Note: The Federal Tax ID number is necessary in the event of any error in monetary transaction, i.e. refund or reimbursement, from the State of Nevada

2. BILLING ADDRESS:

Business/Agency Name:	Mission Support and Test Services, LLC		
Contact Person:	Reed J. Poderis	Phone Number:	(702) 295-0847
Mailing Address:	P.O. Box 98521 M/S NLV082	Fax Number:	(702) 295-7761
City:	Las Vegas County: Clark	State: NV	Zip Code: 89193-8521

3. FACILITY/SITE INFORMATION:

Note: *A separate permit application form must be completed for each discharging facility operated by the applicant.*

Facility Name:	Nevada National Security Site		
Contact Person:	Reed J. Poderis	Phone Number(s):	(702) 295-0847
Email Address:	poderirj@nv.doe.gov	Fax Number:	(702) 295-7761
Street Address/ Location:	P.O. Box 98521 M/S NLV082		
City:	Mercury County: Nye	State: NV	Zip Code: 89193-8521
Township:	N/A Range: N/A	Section(s):	N/A
Latitude:	36.659075 (36°39'32.7"N) NAD 83	Longitude:	-115.999374 (115°59'57.8"W) NAD 83
Discharge Location(s):	Area 12 E-Tunnel		
Discharge Latitude:	37.188163 (37°11'17.4"N) NAD 83	Discharge Longitude:	-116.194734 (116°11'41.0"W) NAD 83
Name of Operator*:	N/A	Certification Grade:	N/A

* If applicable

If you are applying or supplying effluent or biosolids to other sites (reuse sites), please provide the location for each:

Site 1:

Facility Name: N/A Permit No.: _____

Contact Name: _____

Phone No.: _____ Fax No. _____

Email Address: _____

Street Address/ Location: _____

City: _____ County: _____ State: _____ Zip Code: _____

Application Acres: _____

Township: _____ Range: _____ Section(s): _____

Latitude: _____ Longitude: _____

Site 2:

Name: N/A Permit No.: _____

Contact Name: _____ Phone No.: _____

Email Address: _____

Street Address/ Location: _____

City: _____ County: _____ State: _____ Zip Code: _____

Application Acres: _____

Township: _____ Range: _____ Section(s): _____

Latitude: _____ Longitude: _____

Continue listing reuse sites and site information on additional pages, if needed.

4. SITE CHARACTERISTICS:

Maps: **See Attachment 1 for well locations and Attachment 4 for discharge location.**
Include a topographic map and a site map showing the location of the proposed discharge(s) and the location of proposed or existing groundwater monitoring wells, drinking water wells, irrigation or other wells within a one (1) mile radius.

Wells: **See Attachment 2 for well logs and well specifications.**
List all wells on the property and include copies of well logs or well specifications. Continue descriptions on additional sheets if necessary. Complete the following information as accurately as possible.

Well Designation	Well Log Number	Notice of Intent Number	Latitude/Longitude	or	Section, Township, Range
ER 12-1	**N/A**	**N/A**	**37.184857, -116.185091 (37°11'5.5"N, 116°11'6.3"W) NAD 83**		

Hydrology: **See Attachment 2.**

Depth to groundwater:	**1,519.89 feet below ground surface (bgs) (04/17/2017)**
Groundwater elevation:	**4,297.23 feet above mean sea level**
Groundwater flow direction:	**South-southwest**

5. Flow: **See Attachment 3.**

	30-Day Average		Daily Maximum	
Design treatment capacity:	MGD	gpm	MGD	gpm
Requested Flow Limit:	MGD	gpm	MGD	gpm
Current Operational Flow*:	**0.012 MGD***	**8.6 gpm***	MGD	**8.6 gpm***

* *If applicable*
MGD: million gallons per day
gpm: gallons per minute

**** Based on maximum flow rate measured in 2017-2022***

Does the 30-day average flow exceed 85% of the design flow? ☐ YES ☒ NO

If YES, have plans for expansion been submitted for approval by the Division? ☐ YES Date of Submittal: _____

☐ NO Explain Why Not: _____

6.0 DISCHARGE ACTIVITY: See Attachment 4 for Process Flow Diagram.

Describe the activity producing the discharge. (Example – wastewater treatment, dewatering, cooling, manufacturing, etc.). Include pertinent elements of water processing or treatment that could affect the quality of the water discharged. ***Include a Process Flow Diagram.***

Description of facility process *(if applicable)*: **Meteoric and perched groundwater that has collected inside E-tunnel, which was formerly used for underground nuclear testing, is conveyed via 4-inch PVC and 6-inch and 8-inch steel piping into a series of five unlined, bermed basins below the E-tunnel portal. This discharge water has historically contained high levels of tritium that exceed Safe Drinking Water Act standards but are within the Underground Test Area Fluid Management Plan limits.**

7.0 DISPOSAL/REUSE:

Describe the method of disposal and/or reuse application method (irrigation, percolation, evaporation, spray, disk, etc.):
Percolation/infiltration into soil/vadose zone and evaporation into air

8.0 TREATMENT:

Describe the treatment or process that will be used to meet the discharge limits:

This facility does not have any treatment other than natural means of percolation/infiltration into soil/vadose zone and evaporation into air.

A. Has NDEP approved the design of this treatment works? ☒ YES ☐ NO Date Approved: **December 18, 2007**

B. Does this facility have an approved Operations and Maintenance Manual or Effluent Management Plan? ☒ YES ☐ NO Date Approved: **August 2017**

9.0 DISCHARGE CONSTITUENTS: See Attachment 5. Laboratory analytical reports are on file.

Describe the average annual results of the parameters listed below that may be present in the discharge and in the monitoring wells. Also attach copies of all laboratory analytical reports.

Analyte	Concentration (mg/L)	Analyte	Concentration (mg/L)
BOD_5:	N/A	Total Nitrogen as N:	N/A
Total Suspended Solids:	N/A	Kjeldahl Nitrogen as N:	N/A
Total Dissolved Solids:	N/A	Nitrate as N:	Discharge: 0.30 mg/L (Average 2017-2021) Well ER 12-1: not detected (2017-2020)
Fecal Coliform:	N/A		
pH (Standard Units):	Discharge: 7.19 SU (Average 2017-2021) Well ER 12-1: 7.29 SU (Average 2017-2020)	Cyanide (as applicable):	N/A
		Total Phosphorus:	N/A
Chloride:	Discharge: 8.62 mg/L (Average 2017-2021) Well ER 12-1: 15.3 mg/L (Average 2017-2020)	Other:	See Section 13 and associated attachments.

10.0 BIOSOLIDS: N/A

Class of biosolids to be applied/used: _____

Source of biosolids for use (supplier): _____ Permit No. _____

Volume of biosolids to be applied/used per year: (NAC 445A.232) _____

Describe the pathogen and vector controls: _____

An analysis of arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc constituents in biosolids material on a dry weight basis must accompany this application.

If laboratory reports indicate the presence of any **toxic materials** in the discharge, i.e. organics, solvents, metals, petroleum products (benzene, toluene, ethylbenzene, xylene, methyl tertbutyl ether, and total petroleum hydrocarbons), or other contaminants or pollutants, please complete the **attached sheet.** This table is a compilation of the materials listed in NAC445A.144 and the standards found in 40 CFR 141.

If, to the best of your knowledge, you expect that none of the analytes listed above will be present in your discharge, and a laboratory profile was not performed, then please provide a brief explanation why you believe the listed analytes will not be present:

RENEWAL APPLICANTS ONLY: PERMITTEES RENEWING EXISTING PERMITS MUST ALSO COMPLETE ITEMS 9-11.

11.0 MODIFICATIONS:

List and briefly describe any changes to the production, treatment, or disposal processes of the facility since issuance of the current permit: **There have been no changes.**

12.0 DISCHARGE DISCREPANCIES:

List Discharge Monitoring Report (DMR) dates and parameters where the facility exceeded the permitted discharge limits (attach additional sheets if necessary):

The 2020 groundwater sample result for manganese was 0.29 milligrams per liter, which was slightly above the permissible limit of 0.25 milligrams per liter. No other discharge sample or groundwater sample results have exceeded permissible limits since 2017.

13.0 DISCHARGE HISTORY: See Attachment 5 for tabulated data and Attachment 6 for graphs.

Submit graphs of the monitored parameters in the discharge and in any groundwater wells over the time period of the existing permit (e.g., plot BOD_5 vs. month). The time scale should not be less frequent than the permitted sampling frequency. Attach a tabulated compilation of all compliance data for all monitoring parameters analyzed or measured during the preceding five (5) years or the lifetime of the permit, whichever is shorter. Provide the tabulated data in hard copy, and if available, an electronic file compatible with Microsoft Office software (version 97 or later).

I hereby certify that I am familiar with the information contained in the application and that to the best of my knowledge and ability such information is true, complete, and accurate.

Print Name of Applicant: David R. Bowman, PhD

Title: Manager, Nevada Field Office

Signature of Applicant: David R. Bowman Digitally signed by David R. Bowman Date: 2022.12.16 09:59:49 -08'00'

Date:

Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained by the provisions of NAC445A.070 to 445A.348, inclusive, or by any permit, rule, regulation, or order issued pursuant thereto, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NAC 445A.070 to 445A.348, inclusive, or by any permit, rule, regulation, or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment in the county jail for not more than 1 year, or by both fine and imprisonment.

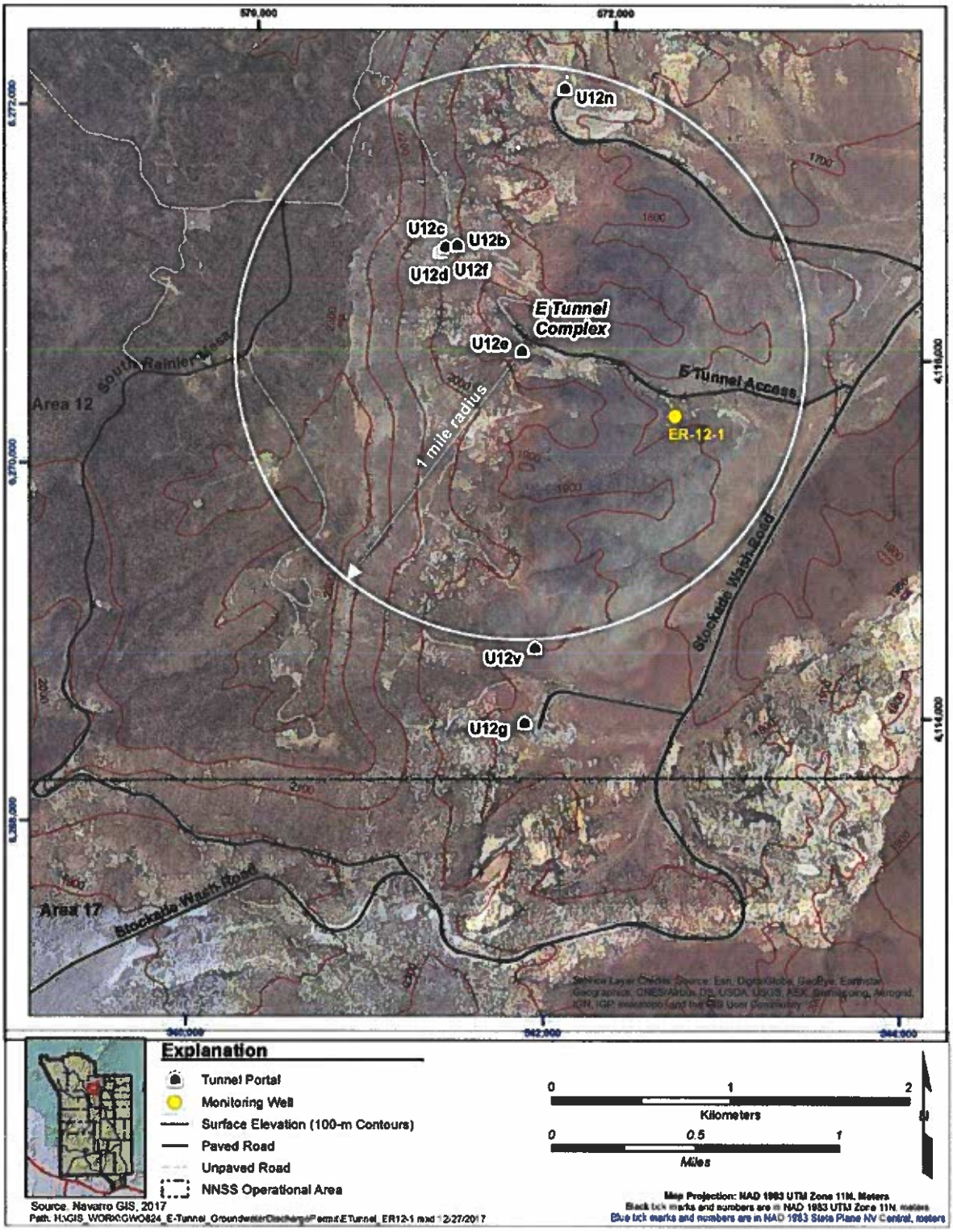
REMIT APPLICATION AND FEE (PER NAC445A.232) TO:

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF FEDERAL FACILITIES
375 E WARM SPRINGS, SUITE 200
LAS VEGAS, NEVADA 89119
ATTENTION: BUREAU CHIEF

PHONE: 702-688-3900

Attachment 1

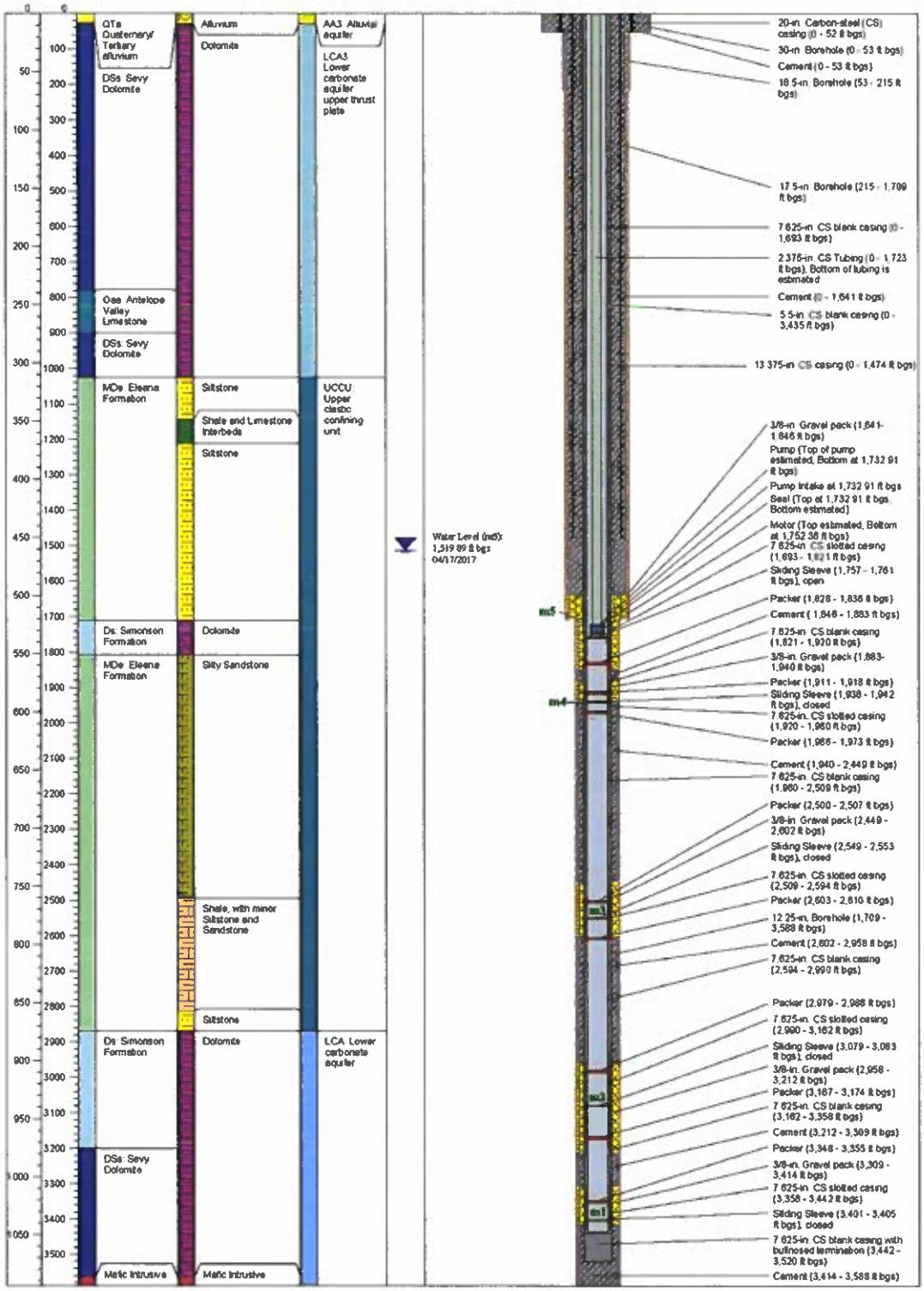
Section 4: Topographic Map



Section 4: Well Logs and Construction Descriptions/Specifications

Well ID: ER-12-1		UTM NAD 27	Northing: 4,115,492.84	Easting: 572,411.67
Start Date: 07/19/1991	Stop Date: 10/17/1991	NSPC NAD 83	Northing: 6,270,249.54 m	Easting: 542,757.71 m
Drilling Program: Groundwater Characterization Program		Lat/Long NAD 83	Deg N: 37.184857	Deg W: 116.185091
Environmental Contractor: DRI		Surface Elevation	5,817.12 ft amsl	1,773.06 m amsl
Drilling Contractor: REECo		Drill Method: Conventional, Air hammer, Rotary and Reverse Air		Drilled Depth: 3,588 ft bgs

Well Construction Diagram (Current as of 03/21/2018)



Source: Modified from ER-12-1 Completion Report, DOE/NV/10845-36, Navarro Groundwater Sampling Records 2017, Int. Samp. Plan ID's (ISPIDS) - https://extranet.nv.doe.gov/Boreholes/ISPIDS.xlsx accessed on 03/21/2018; Stratigraphy / Lithology from "UGTA Stratigraphy and Lithology Database," UGTA Technical Data Repository Database Identification Number UGTA-4-134. Navarro, 2017

Attachment 2

ER-12-1 Well Construction Diagram

Attachment 3

Section 5: Flow

	2017			2018			2019			2020			2021			2022		
	L/min	gpm	MGD	L/min	gpm	MGD	L/min	gpm	MGD	L/min	gpm	MGD	L/min	gpm	MGD	L/min	gpm	MGD
January				27.9	7.4	0.011	28.6	7.6	0.011	29.6	7.8	0.011	27.6	7.3	0.010	29.1	7.7	0.011
February				28.7	7.6	0.011	29.9	7.9	0.011	28.4	7.5	0.011	29.2	7.7	0.011	29.3	7.7	0.011
March				29.6	7.8	0.011	32.5	8.6	0.012	30.1	8.0	0.011	29.2	7.7	0.011	28.6	7.6	0.011
April				28.1	7.4	0.011	30.9	8.2	0.012	29.9	7.9	0.011	28.8	7.6	0.011	29.2	7.7	0.011
May				28.0	7.4	0.011	30.9	8.2	0.012	30.1	8.0	0.011	29.3	7.7	0.011	29.2	7.7	0.011
June				28.3	7.5	0.011	28.1	7.4	0.011	29.0	7.7	0.011	28.1	7.4	0.011	28.8	7.6	0.011
July				27.8	7.3	0.011	30.5	8.1	0.012	29.5	7.8	0.011	28.3	7.5	0.011	28.5	7.5	0.011
August				28.1	7.4	0.011	30.2	8.0	0.011	28.6	7.6	0.011	29.3	7.7	0.011	28.5	7.5	0.011
September				29.1	7.7	0.011	30.6	8.1	0.012	28.6	7.6	0.011	28.6	7.6	0.011	28.6	7.6	0.011
October	26.9	7.1	0.010	28.5	7.5	0.011	28.7	7.6	0.011	28.2	7.4	0.011	29.6	7.8	0.011			
November	27.9	7.4	0.011	26.1	6.9	0.010	30.8	8.1	0.012	28.4	7.5	0.011	28.4	7.5	0.011			
December	27.9	7.4	0.011	27.8	7.3	0.011	28.6	7.6	0.011	28.5	7.5	0.011	28.4	7.5	0.011			

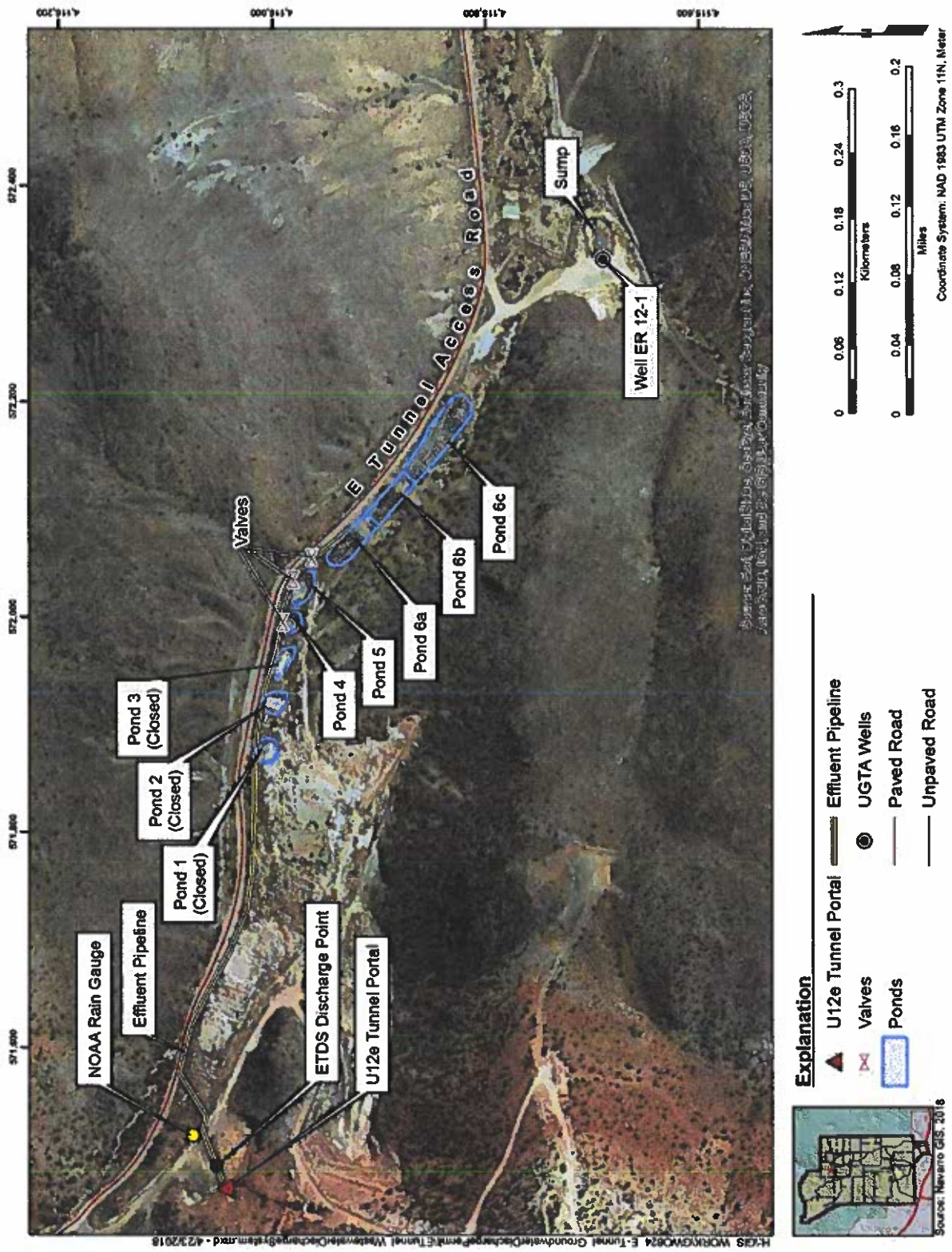
L/min: liter(s) per minute

gpm: gallon(s) per minute

MGD: million gallon(s) per day

Attachment 4

Section 6: Flow Diagram



E-Tunnel Wastewater Disposal System and Well ER-12-1 Site Layout

Attachment 5

Section 9: Discharge Constituents

Parameter (Units)	Permissible Limit	2017	2018	2019	2020	2021
Adjusted Gross Alpha (pCi/L)	35.1	9.7	11.8	10.7	5.8	5.5
Gross Beta (pCi/L)	101	25.3	23.0	21.7	25.7	19.1
Tritium (pCi/L)	1,000,000	313,000	277,000	268,000	281,000	253,000
Cadmium (mg/L)	0.045	0.005 U	0.005 U	0.005 U	0.0002 U	0.0002 U
Chloride (mg/L)	360	8.8	8.8	8.7	8.4	8.4
Chromium (mg/L)	0.09	0.01 U	0.005 U	0.01 U	0.006 U	0.006 U
Copper (mg/L)	1.2	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U
Fluoride (mg/L)	3.6	0.17	0.20	0.19	0.19	0.25
Iron (mg/L)	5.0	2.9 J	2.2	0.8	1.4	0.92
Lead (mg/L)	0.014	0.003 U	0.001	0.003	0.0009	0.0007
Magnesium (mg/L)	135	1.1 J	0.9	0.8	0.7	0.69
Manganese (mg/L)	0.25	0.034	0.025	0.010	0.016	0.010
Mercury (mg/L)	0.0018	0.0002 U	0.0002 U	0.0002 U	0.0001 U	0.00007 J
Nitrate Nitrogen (mg/L)	9.0	0.32	0.33	0.29	0.29	0.27
Selenium (mg/L)	0.045	0.005 U	0.005 U	0.005 U	0.0007 U	0.0007 U
Sulfate (mg/L)	450	16.0	16.0	16.0	14.0	14.0
Zinc (mg/L)	4.5	0.03	0.03	0.01	0.015 J	0.010 J
Specific Conductance (µS/cm)*	1,500	375	380	373	370	369
Hydrogen Ion Activity (SU)*	Between 6.0 and 9.0	7.21	7.12	7.18	7.13	7.30

* Average annual results

J: estimated concentration (result between the minimum detection limit and the reporting limit)

U: not detected above the minimum detection limit (result listed is the minimum detection limit)

Attachment 5

Section 9: Well ER 12-1 Groundwater Constituents

Parameter (Units)	Permissible Limit	April 2017	April 2019	August 2020
Adjusted Gross Alpha (pCi/L)	15	8.0	8.1	-24 / 6.0*
Gross Beta (pCi/L)	50	5.6	6.0	7.3
Tritium (pCi/L)	20,000	345 U	-100 U	-54 U
Cadmium (mg/L)	0.005	0.005 U	0.005 U	0.00015 U
Chloride (mg/L)	250	17	15	14
Chromium (mg/L)	0.09	0.005 U	0.01 U	0.0062 U
Copper (mg/L)	1.2	0.01 U	0.0012 J	0.0082 J
Fluoride (mg/L)	3.6	0.36	0.22	0.25
Iron (mg/L)	5.0	3.4	3.2	3.3
Lead (mg/L)	0.014	0.003 U	0.003 U	0.0066
Magnesium (mg/L)	135	66	64.5	57
Manganese (mg/L)	0.25	0.15	0.093	**0.29 / 0.28***
Mercury (mg/L)	0.0018	0.0002 U	0.0002 U	0.00006 U
Nitrate Nitrogen (mg/L)	9	0.15 U	0.2 U	0.2 U
Selenium (mg/L)	0.045	0.005 U	0.005 U	0.00067 U
Sulfate (mg/L)	450	340	370	340
Zinc (mg/L)	4.5	0.26	0.011 J	0.33
Specific Conductance (µS/cm)	1,500	976	1,046	992
Hydrogen Ion Activity (SU)	6.0 to 9.0	7.20	7.26	7.40

* Second result is reanalysis on January 29 and 30, 2021

J: estimated concentration (result between the minimum detection limit and the reporting limit)

U: not detected above the minimum detection limit (result listed is the minimum detection limit)

Attachment 6
Section 13: Discharge History

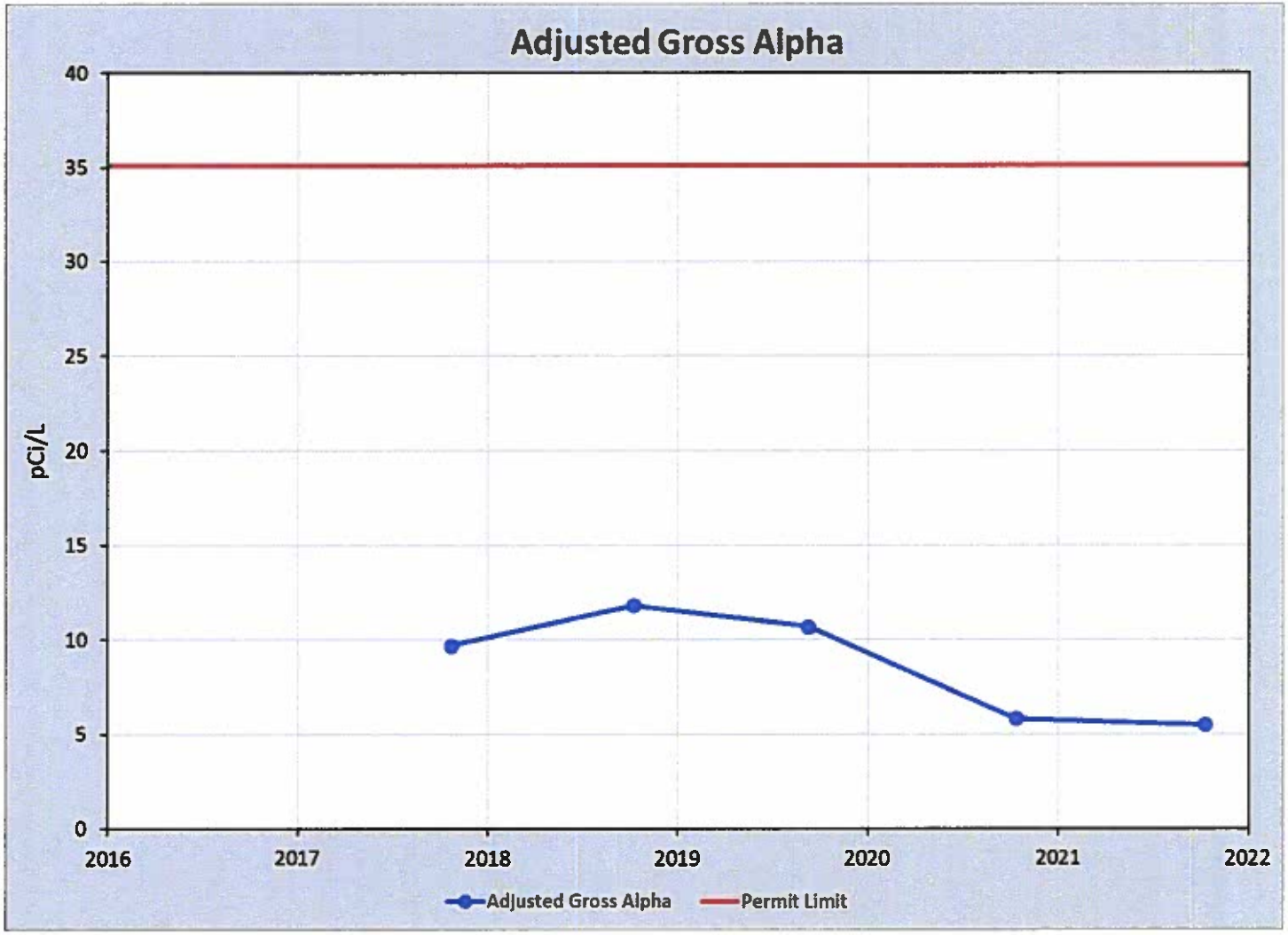


Figure 1. Adjusted Gross Alpha Annual Discharge Sample Results

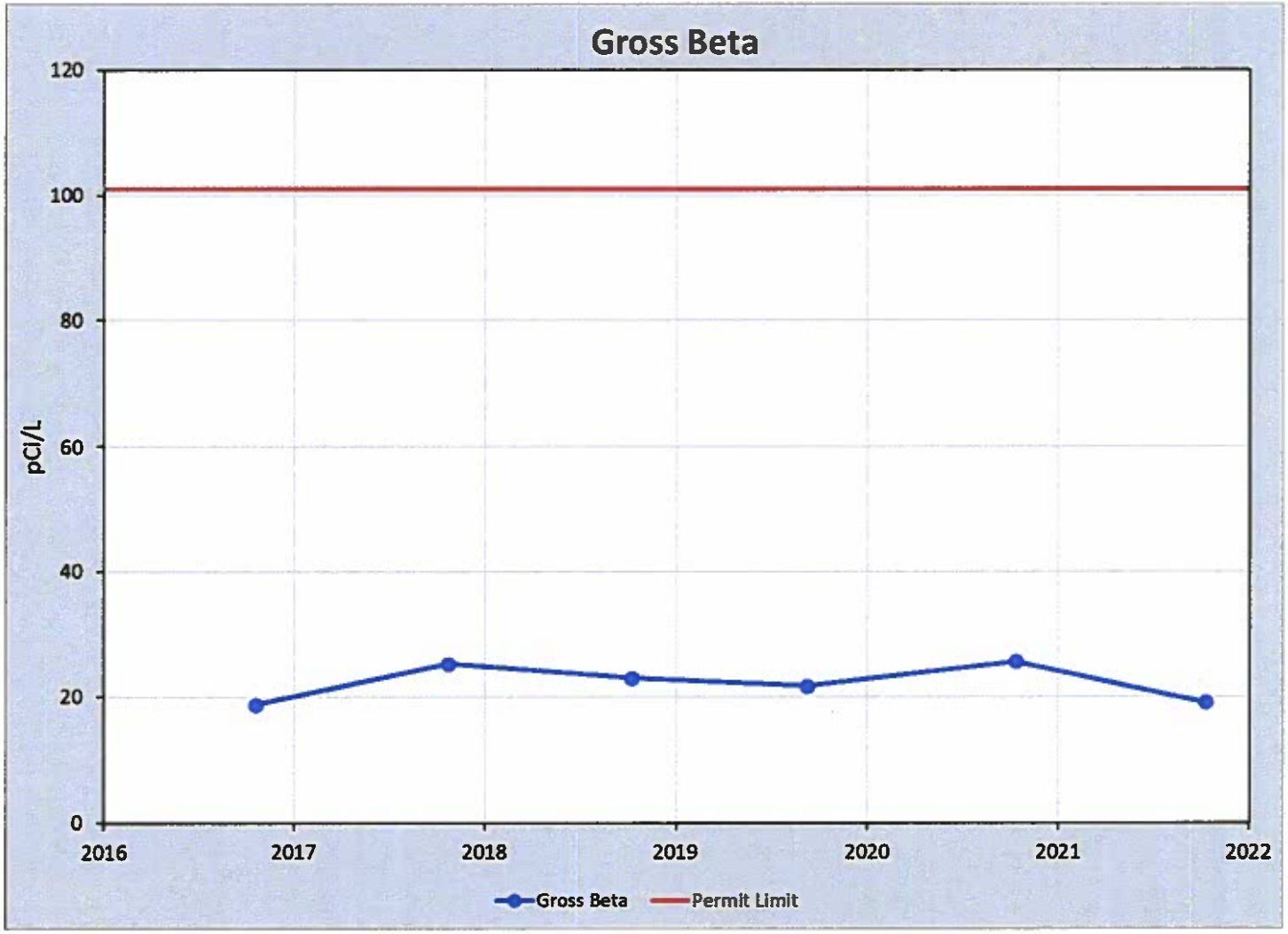


Figure 2. Gross Beta Annual Discharge Sample Results

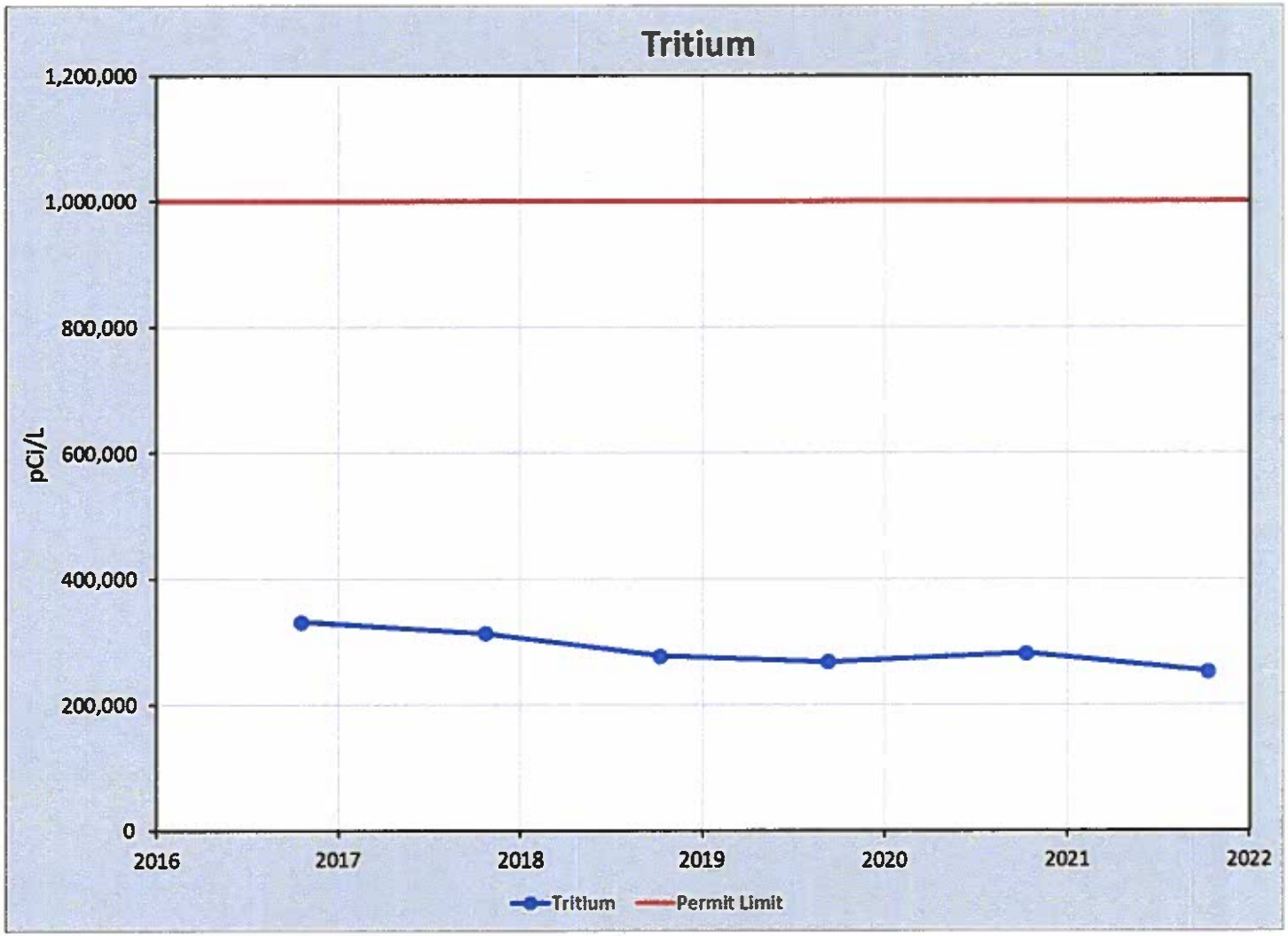


Figure 3. Tritium Annual Discharge Sample Results

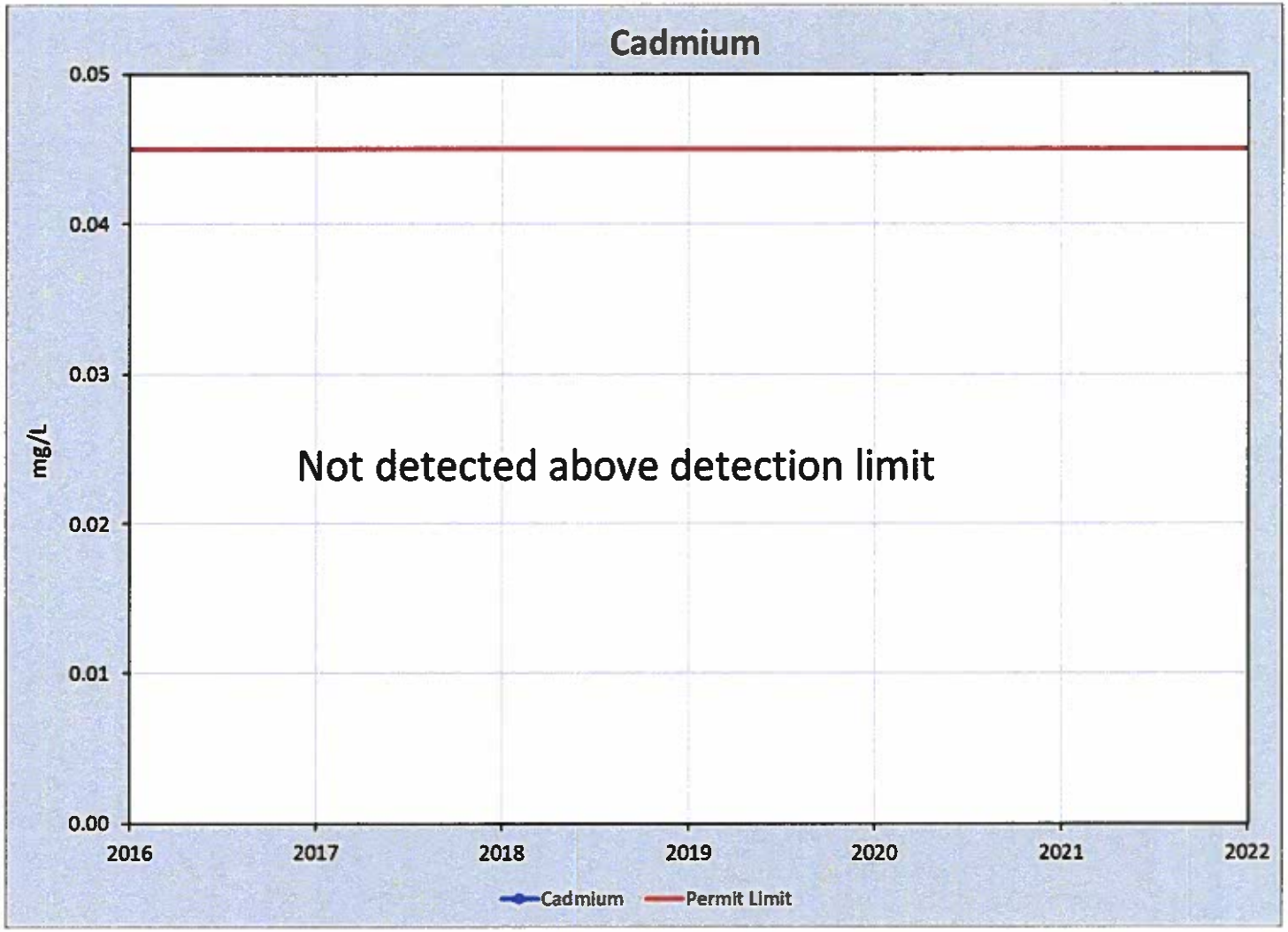


Figure 4. Cadmium Annual Discharge Sample Results

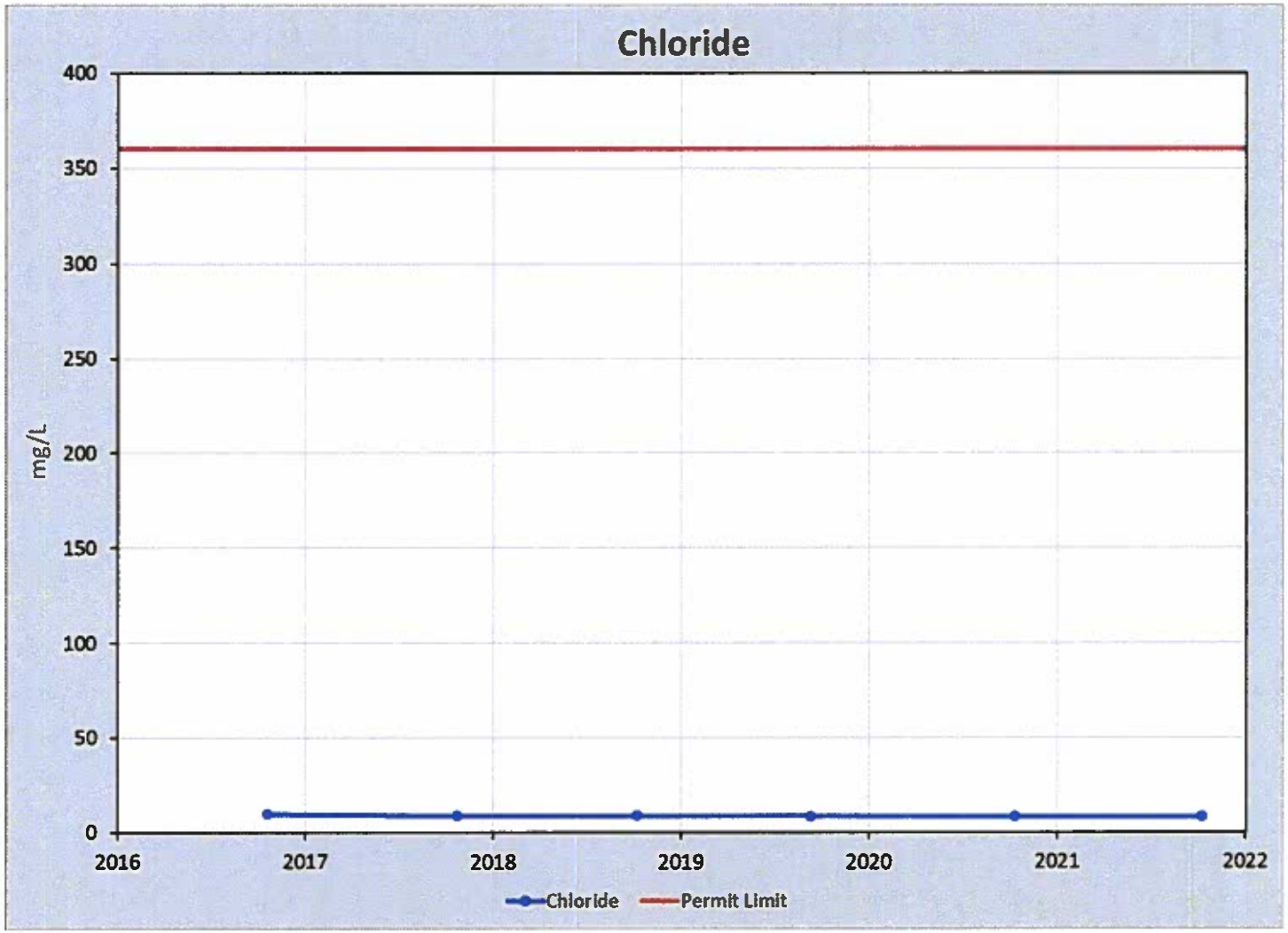


Figure 5. Chloride Annual Discharge Sample Results

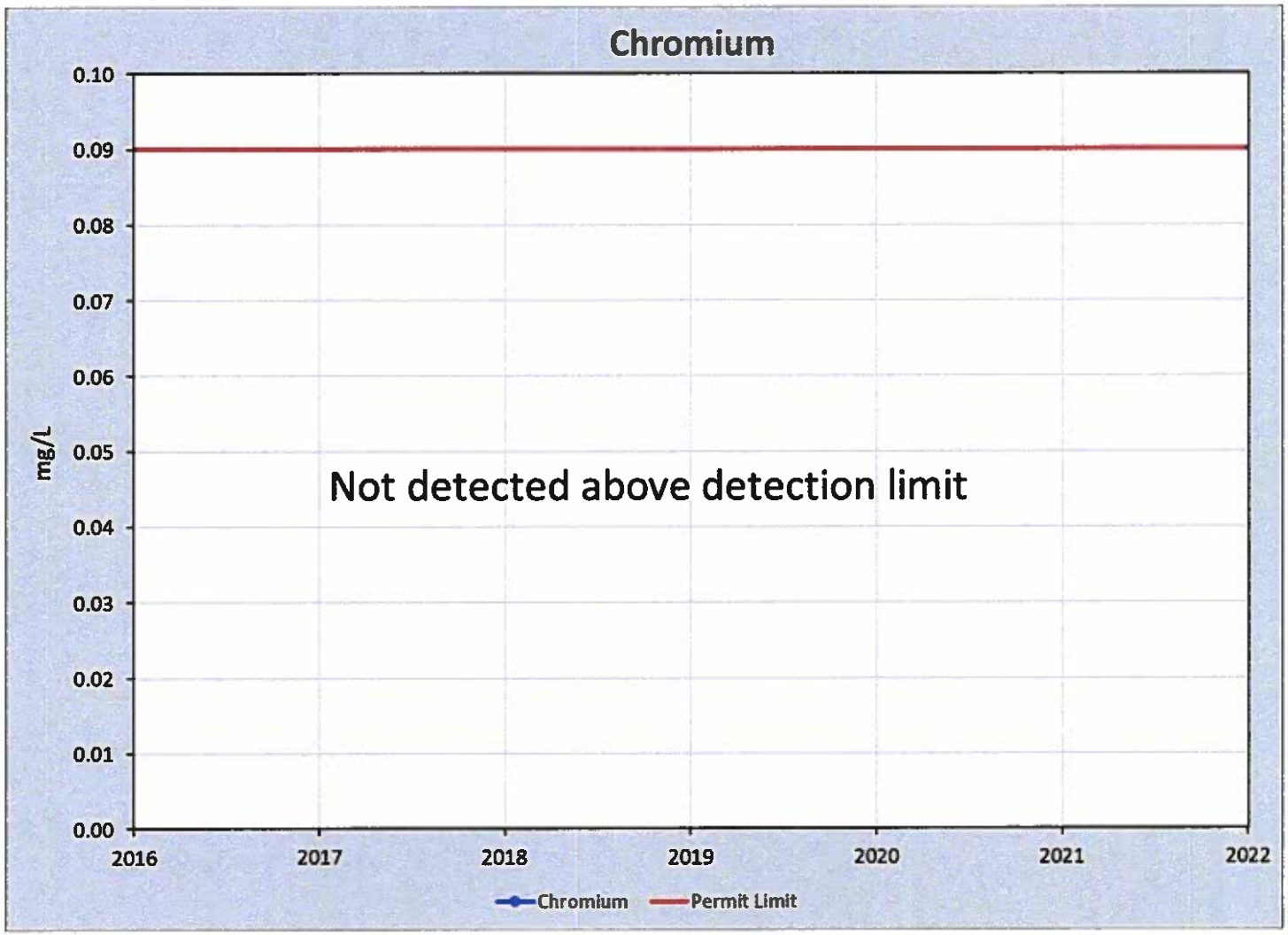


Figure 6. Chromium Annual Discharge Sample Results

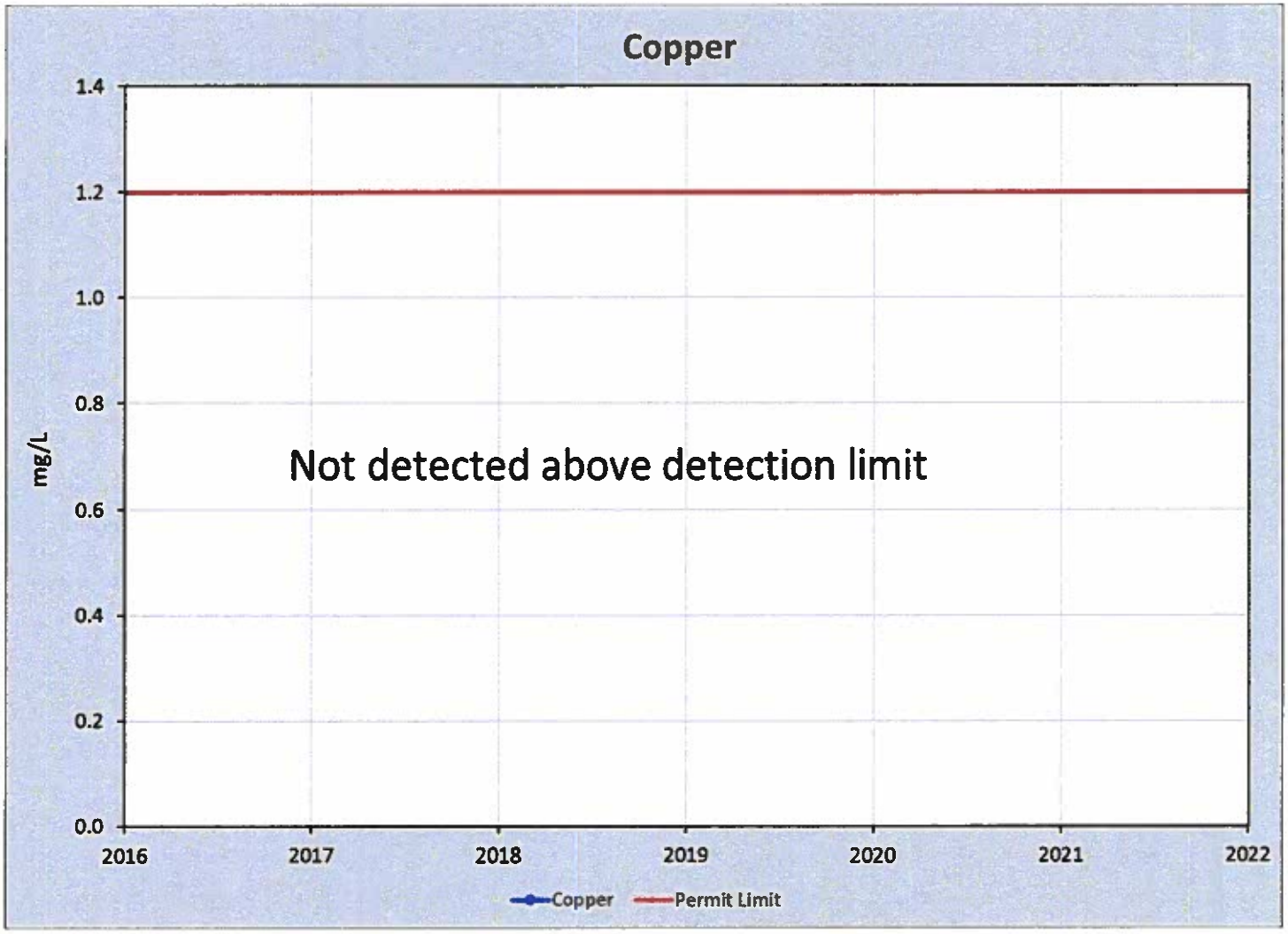


Figure 7. Copper Annual Discharge Sample Results

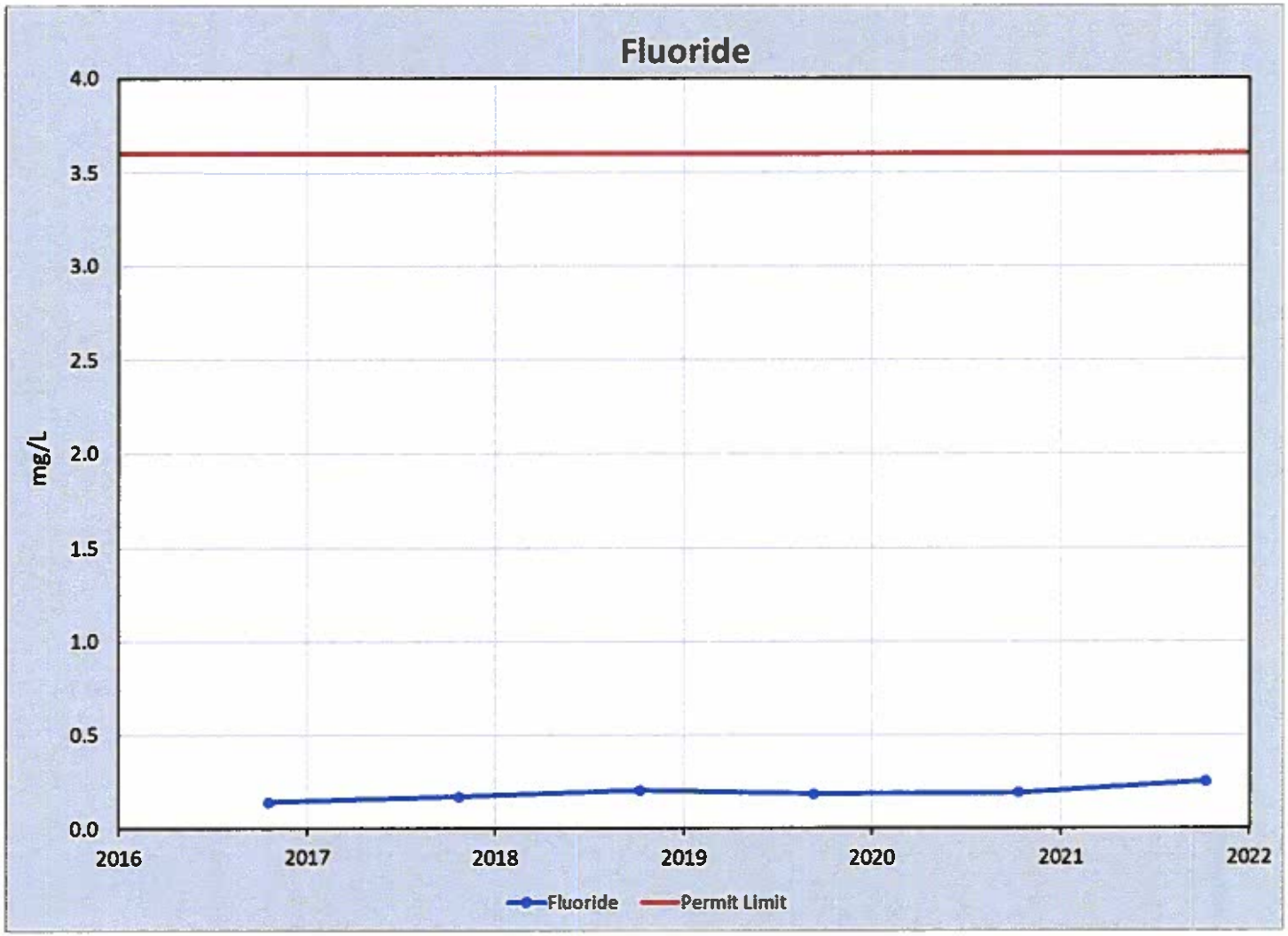


Figure 8. Fluoride Annual Discharge Sample Results

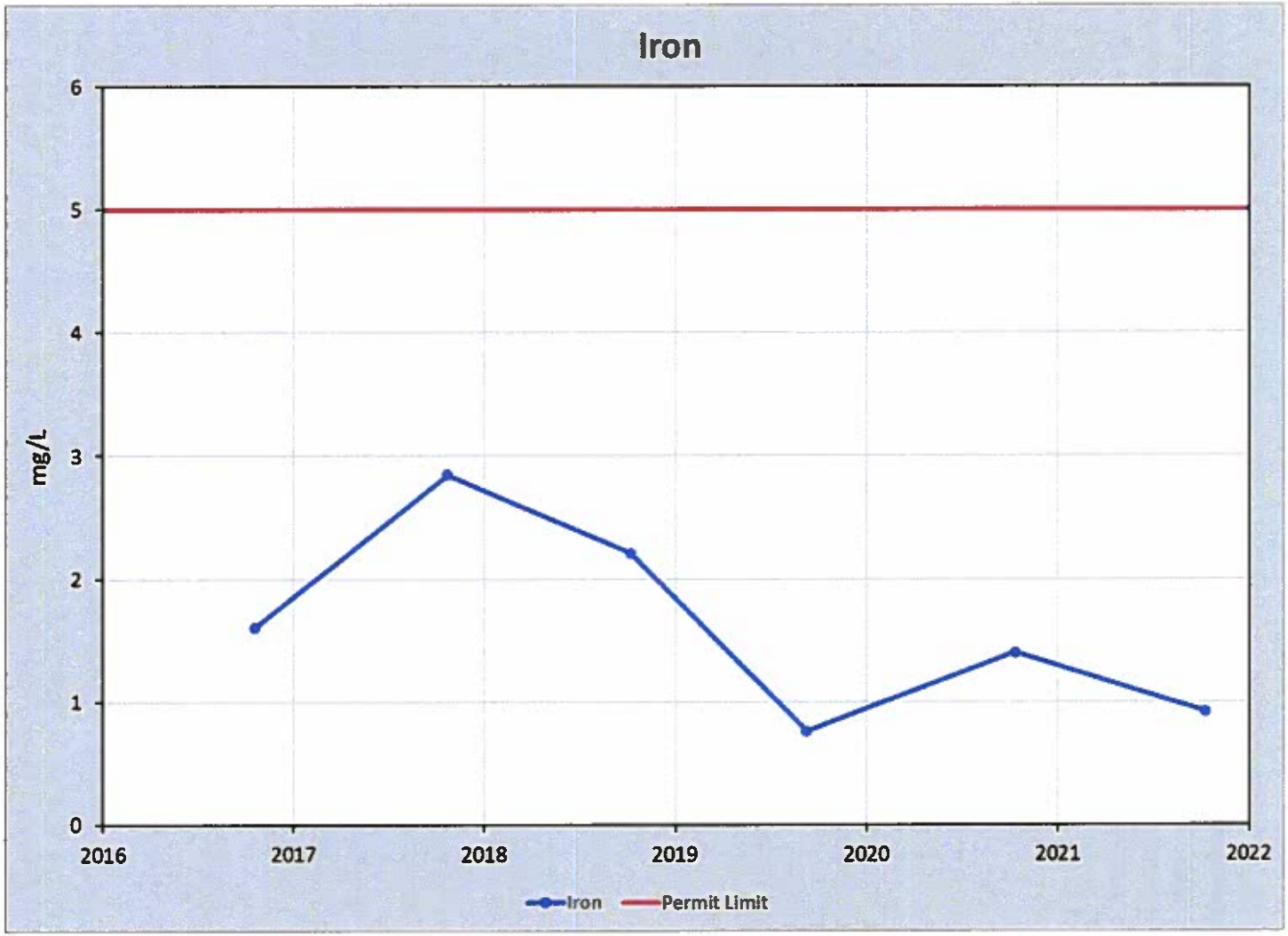


Figure 9. Iron Annual Discharge Sample Results

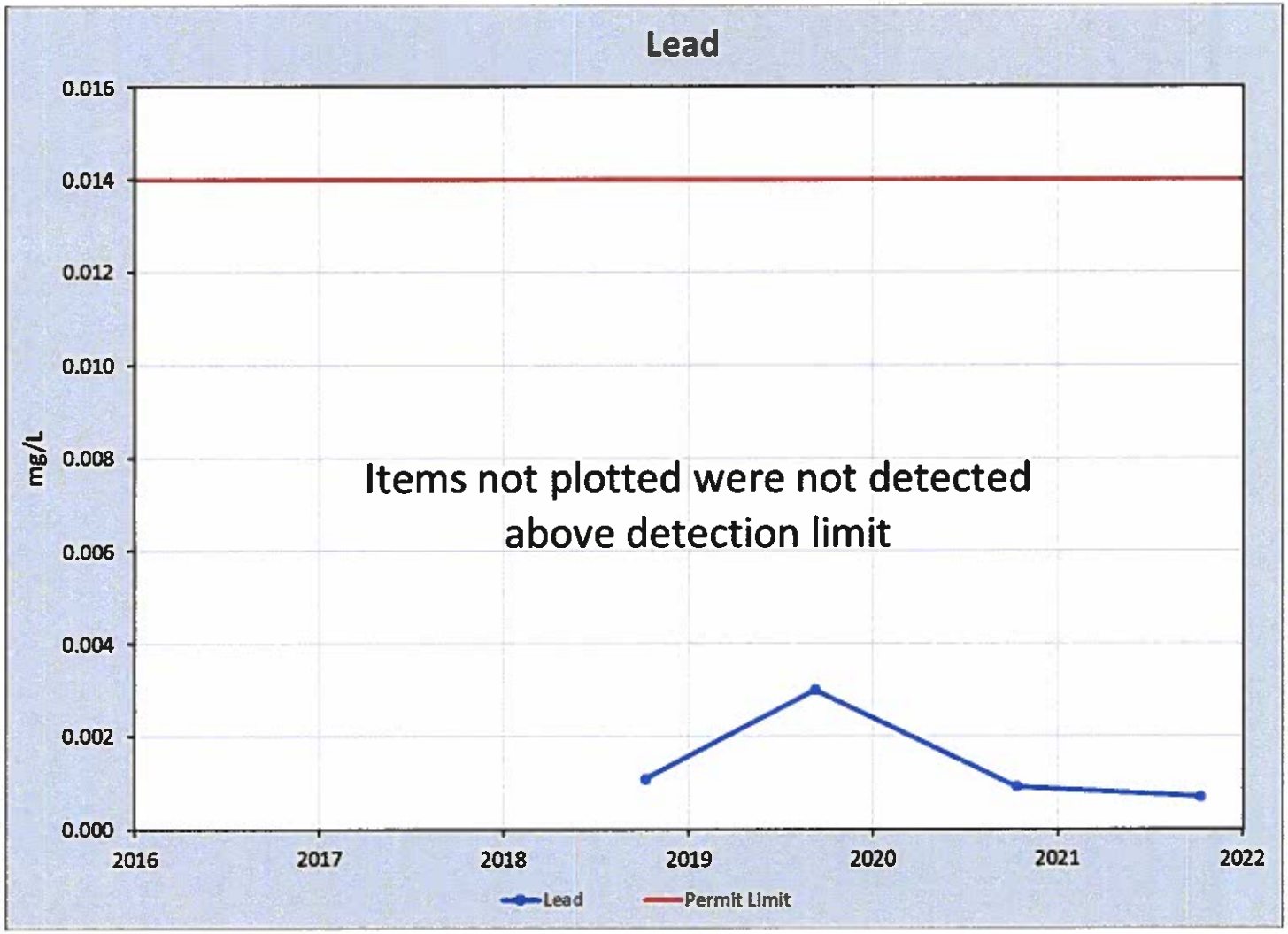


Figure 10. Lead Annual Discharge Sample Results

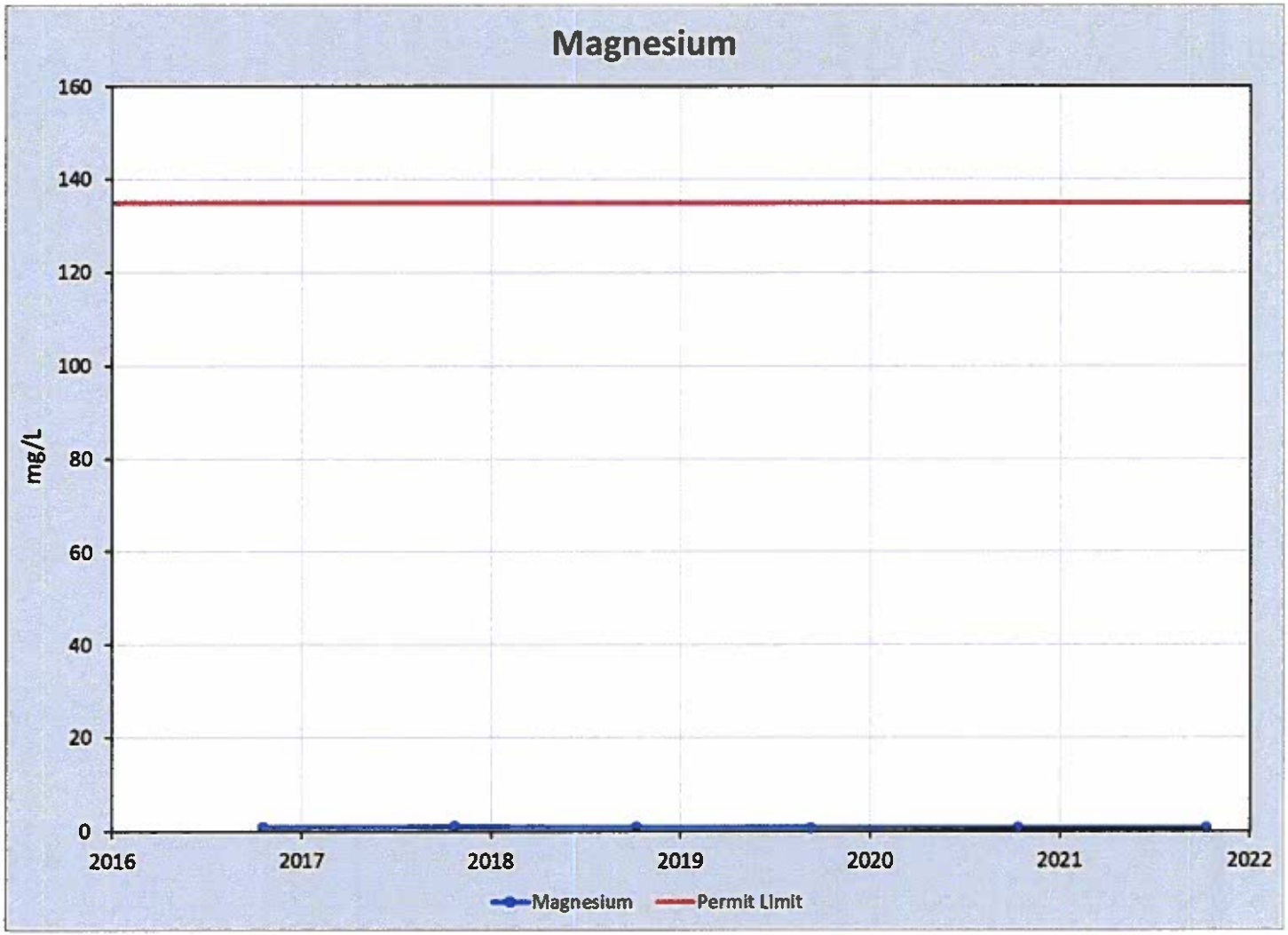


Figure 11. Magnesium Annual Discharge Sample Results

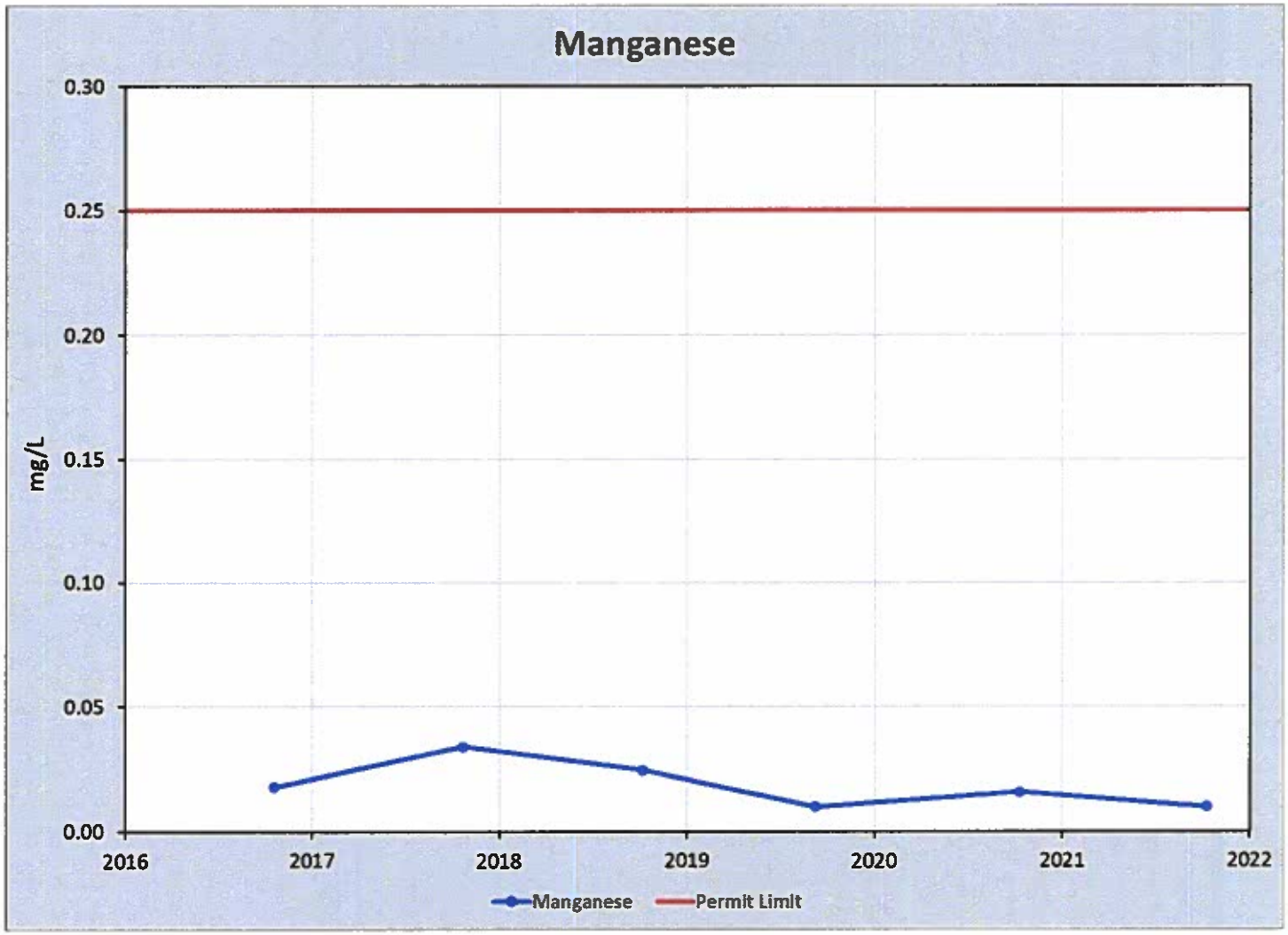


Figure 12. Manganese Annual Discharge Sample Results

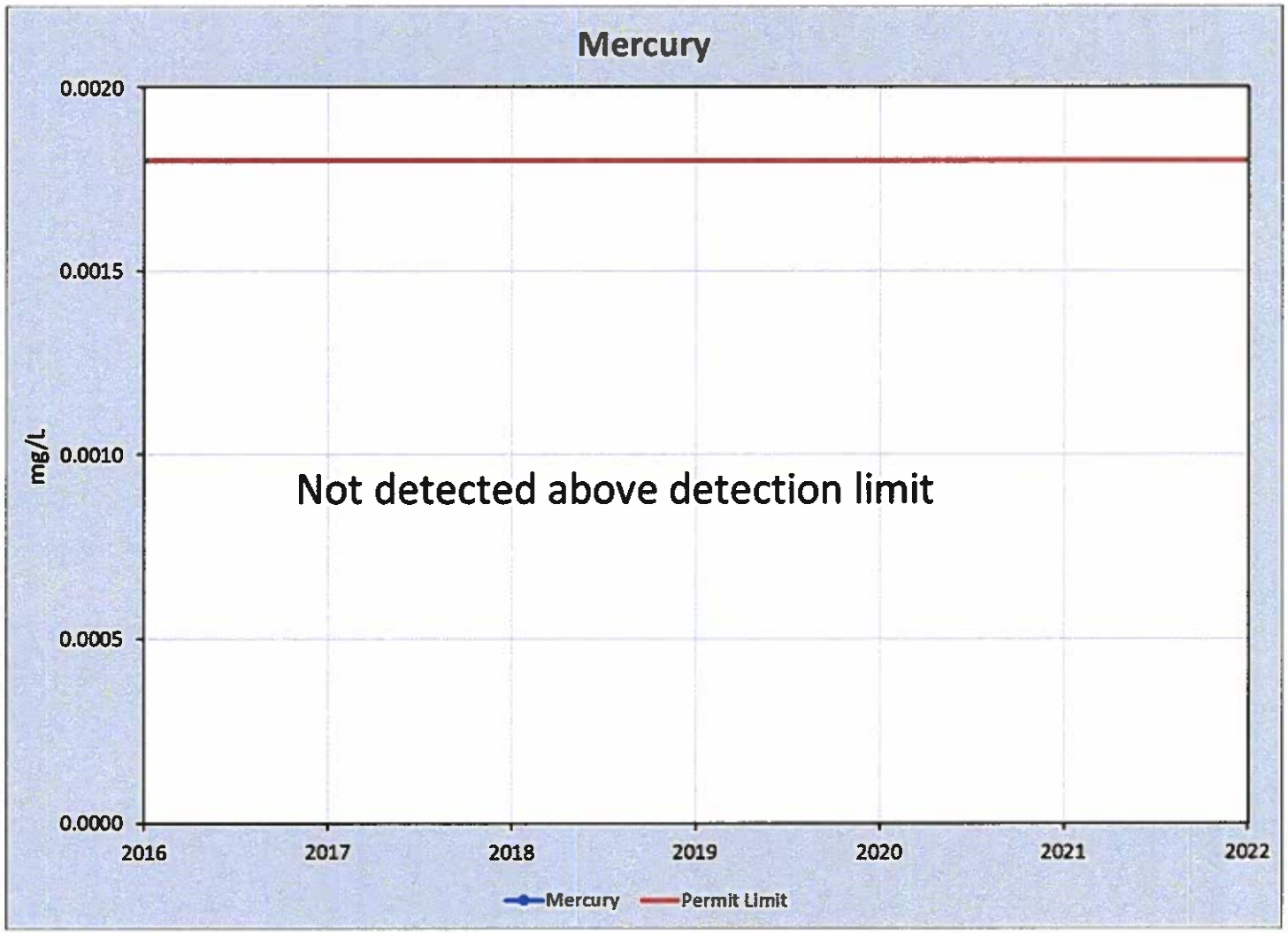


Figure 13. Mercury Annual Discharge Sample Results

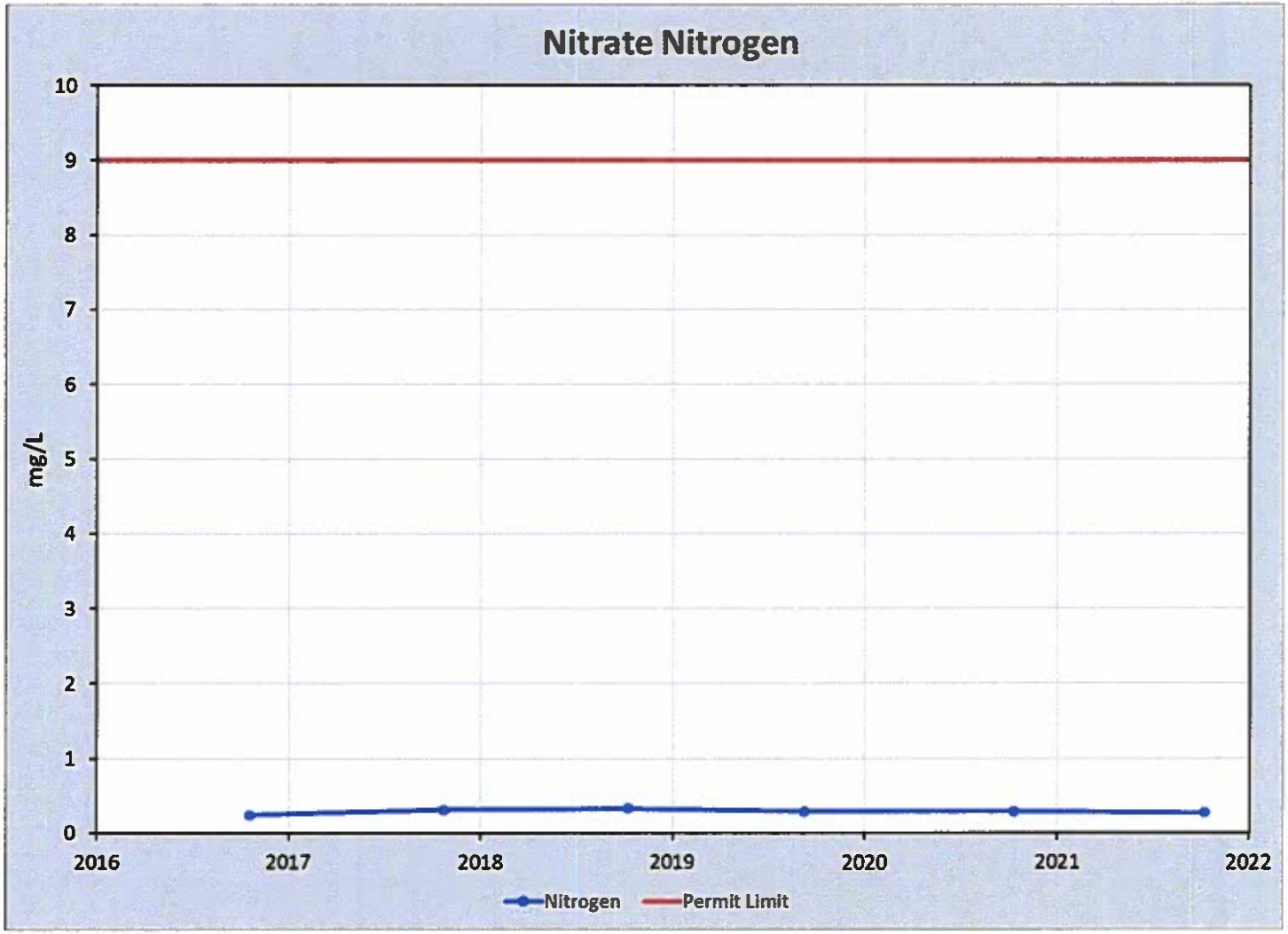


Figure 14. Nitrate Nitrogen Annual Discharge Sample Results

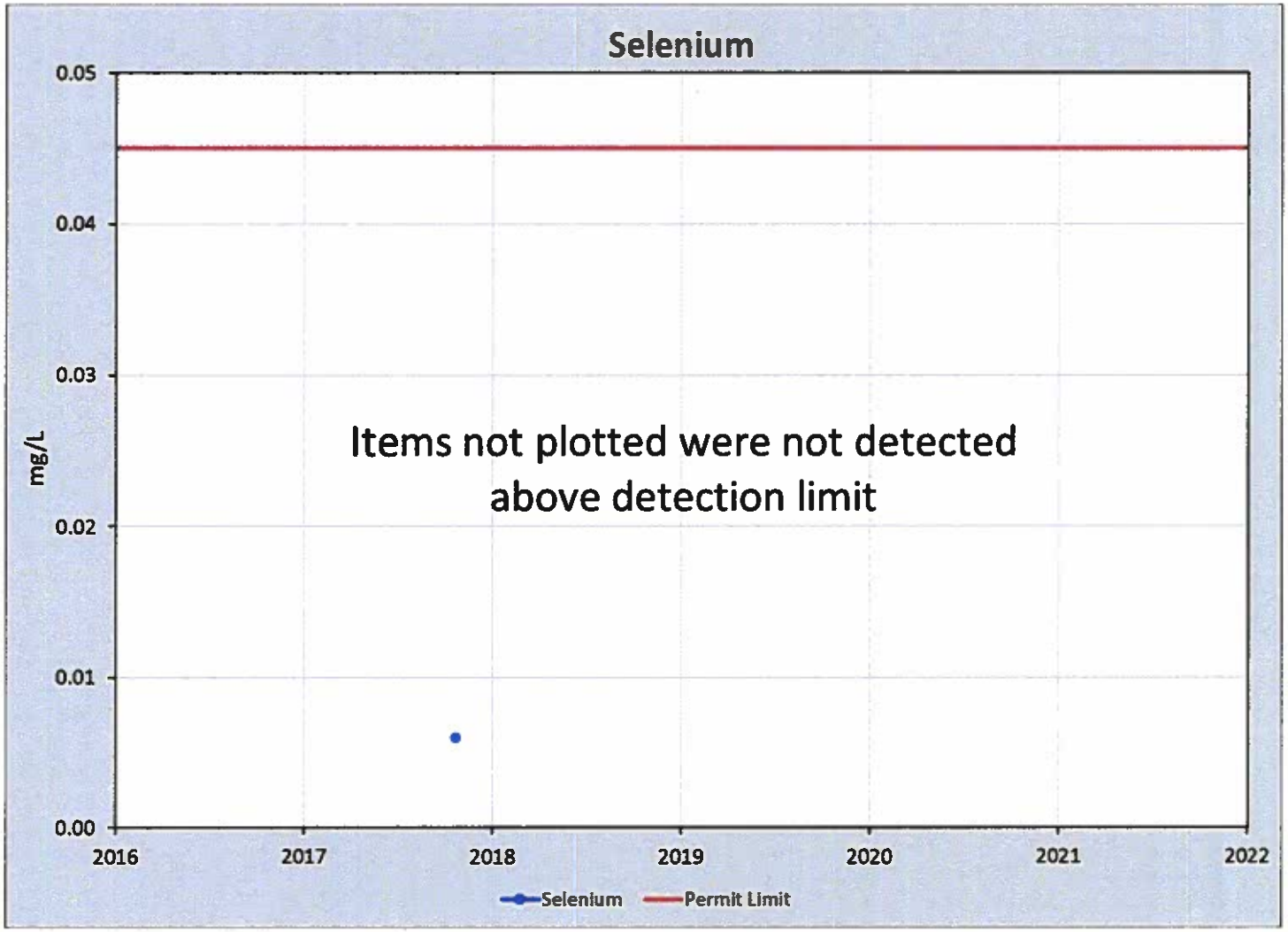


Figure 15. Selenium Annual Discharge Sample Results

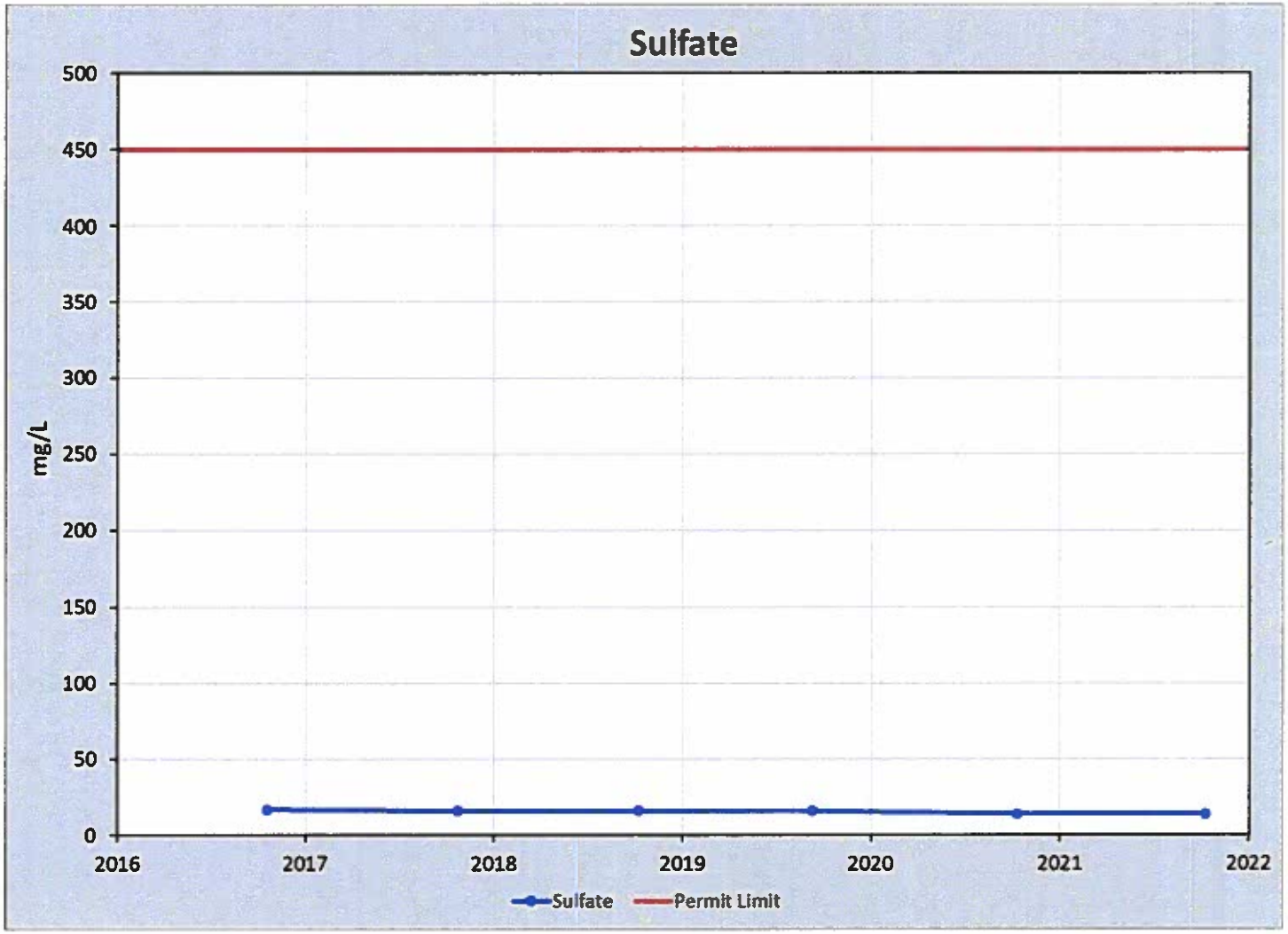


Figure 16. Sulfate Annual Discharge Sample Results

Figure 17. Zinc Annual Discharge Sample Results

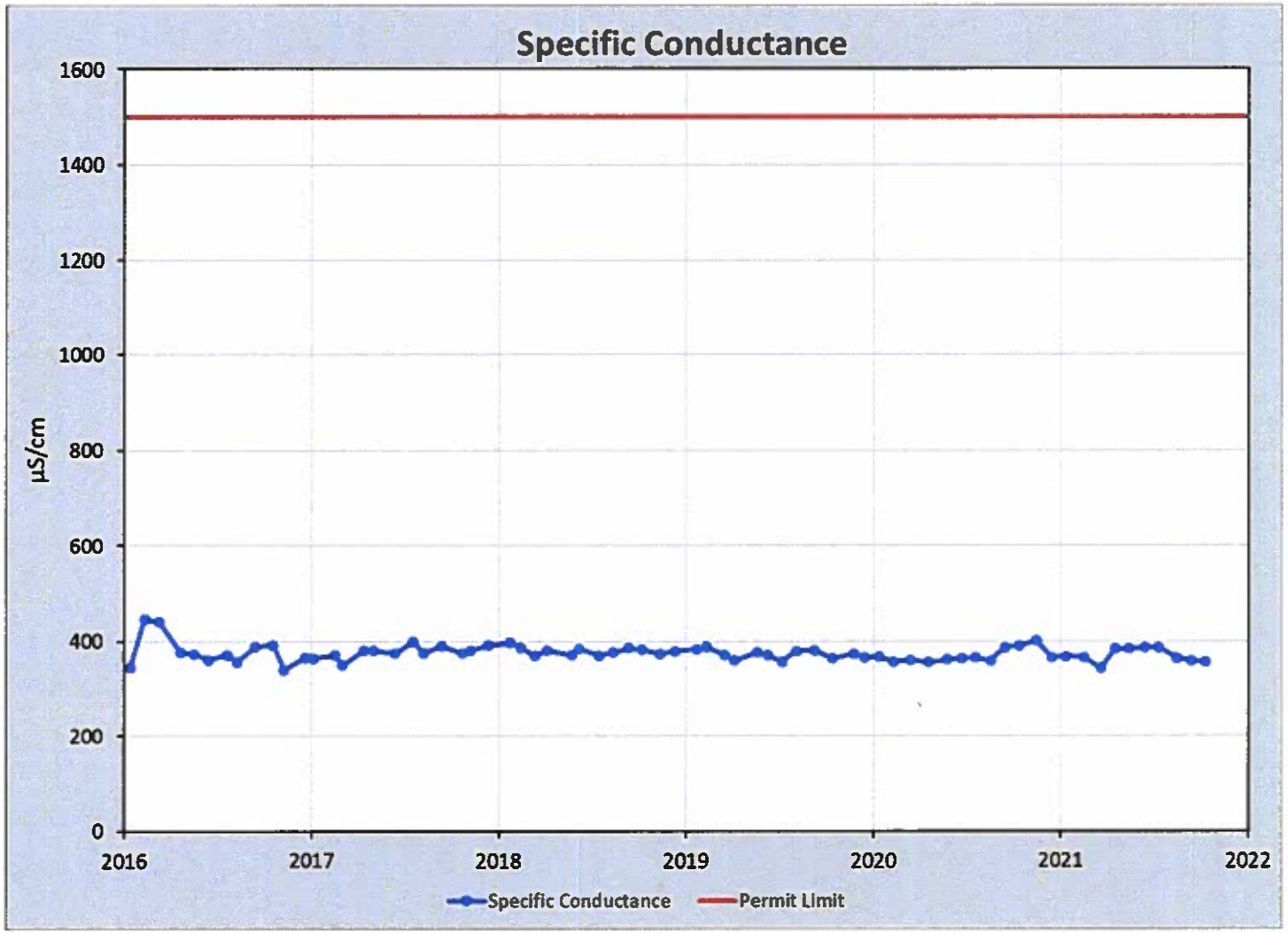


Figure 18. Specific Conductance Annual Discharge Sample Results

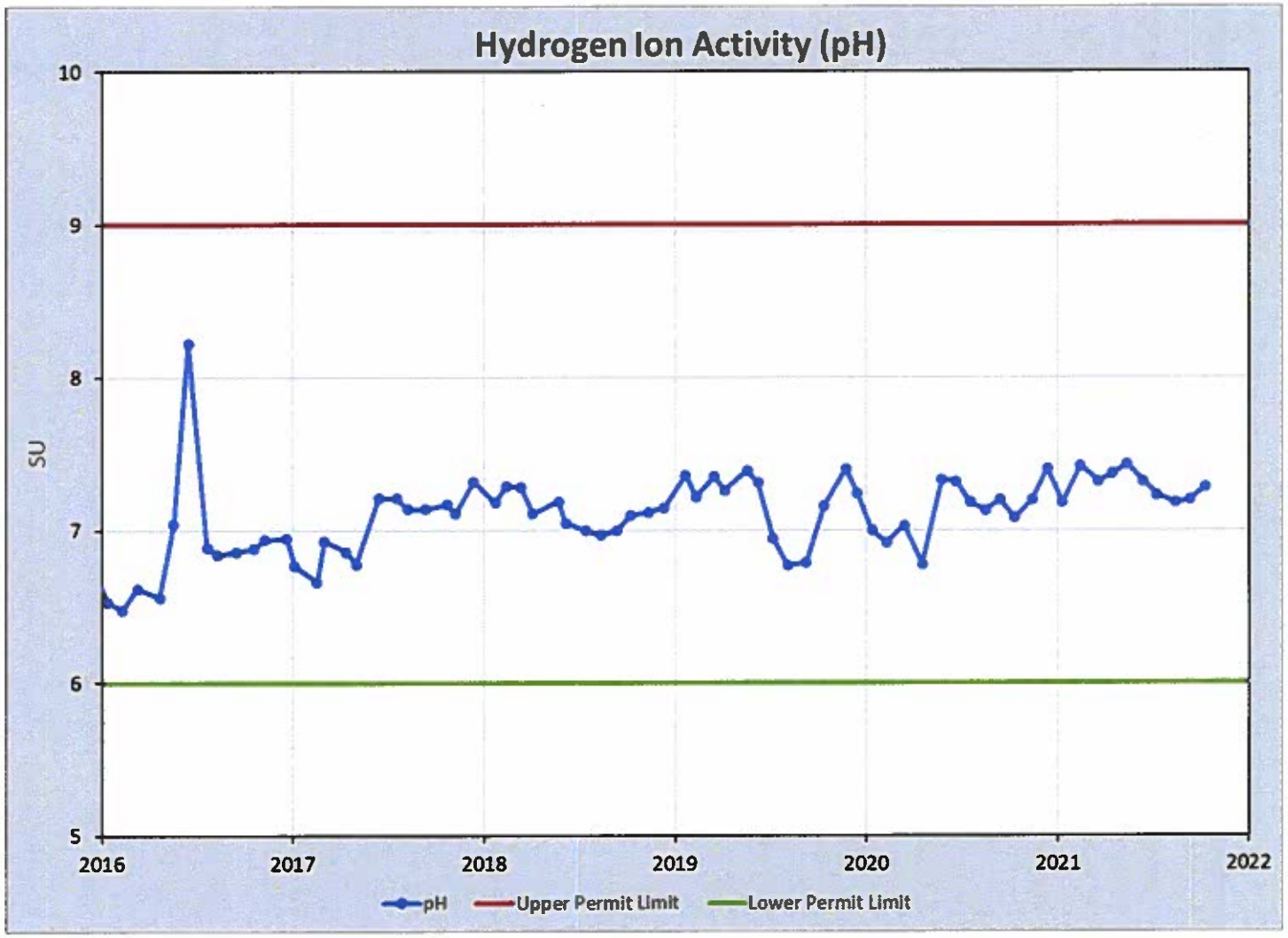


Figure 19. Hydrogen Ion Activity (pH) Annual Discharge Sample Results

Attachment 6
Section 13: Well ER 12-1 Groundwater History

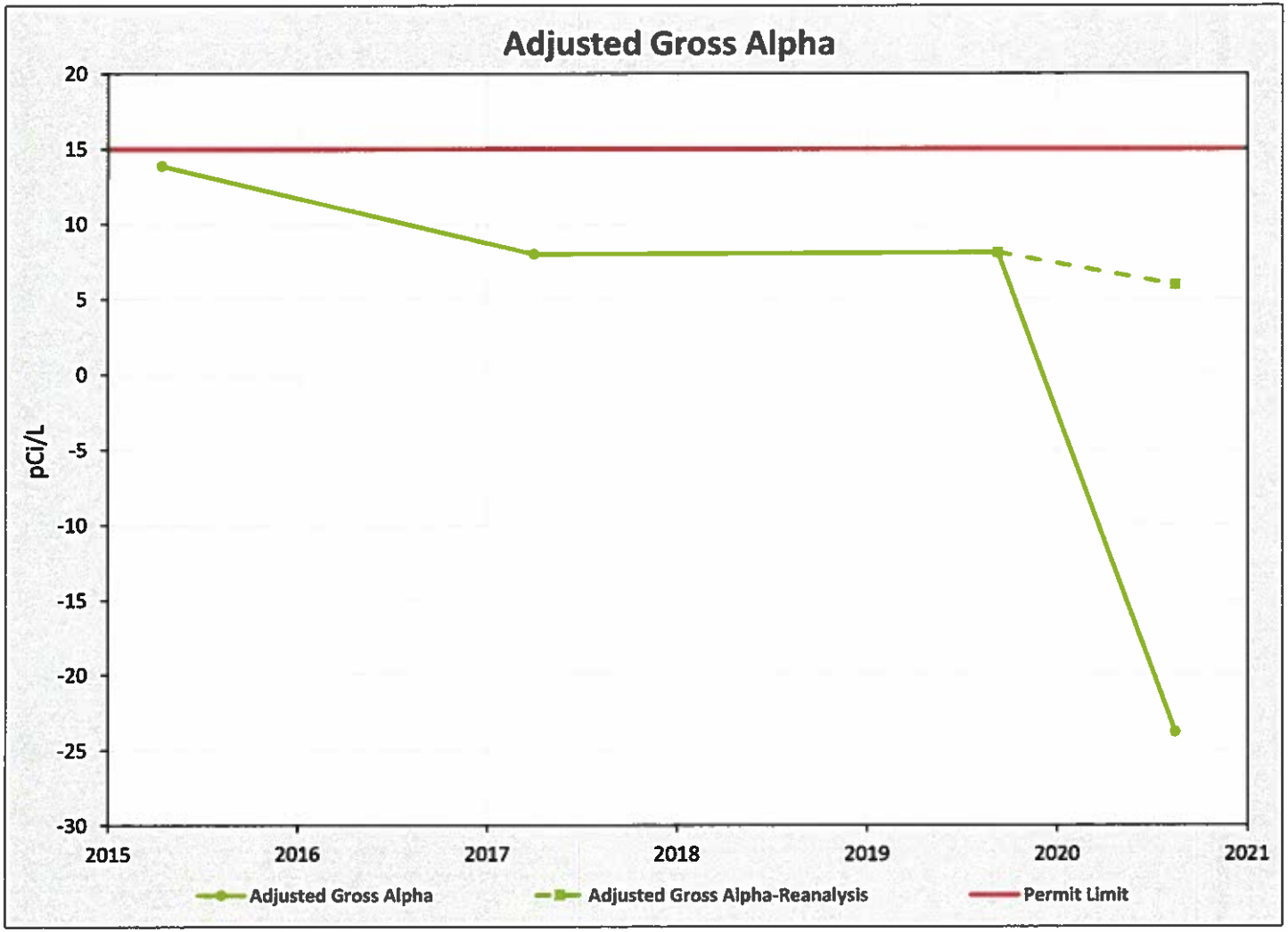


Figure 20. Adjusted Gross Alpha Well ER 12-1 Sample Results

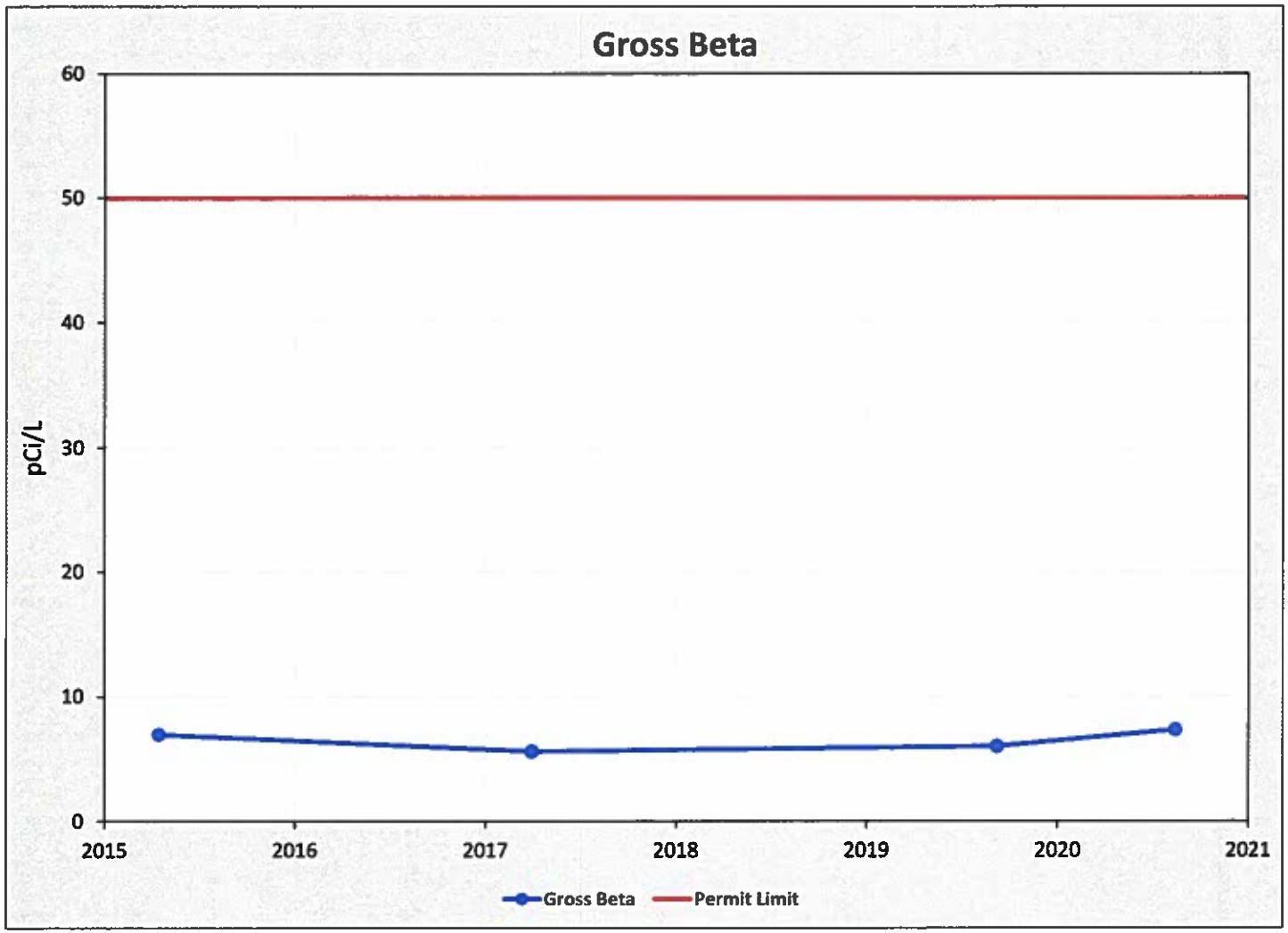


Figure 21. Gross Beta Well ER 12-1 Sample Results

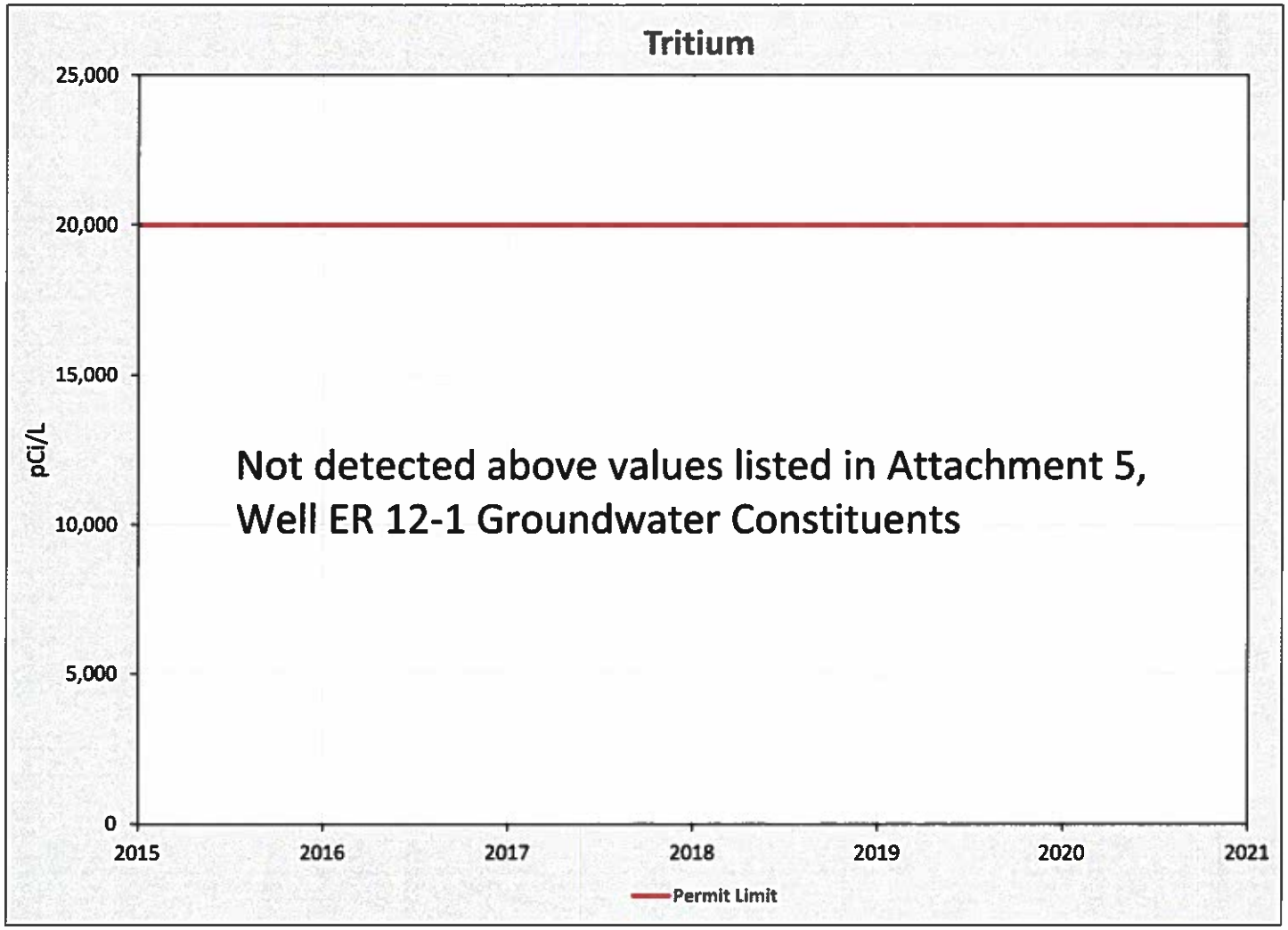


Figure 22. Tritium Well ER 12-1 Sample Results

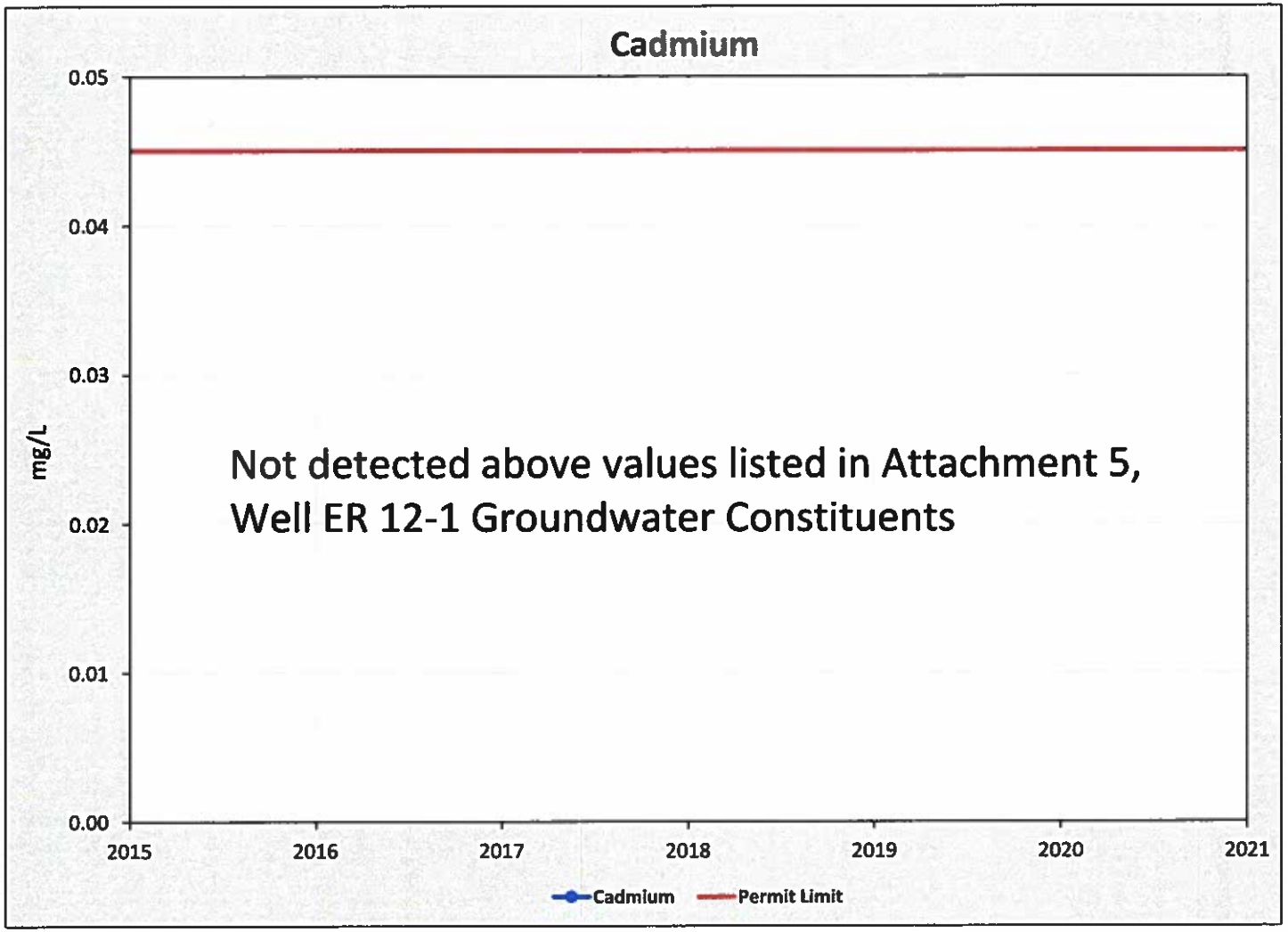


Figure 23. Cadmium Well ER 12-1 Sample Results

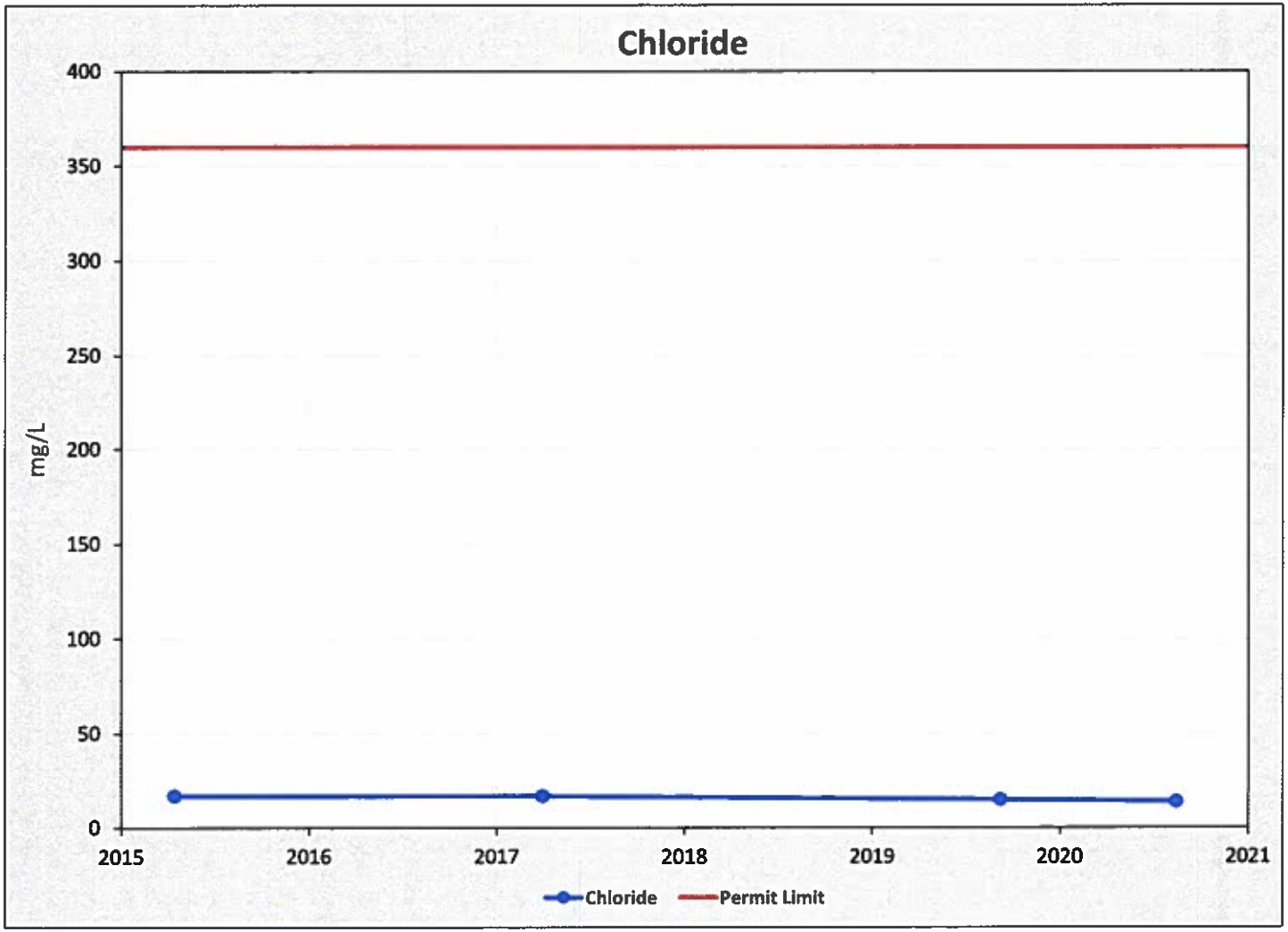


Figure 24. Chloride Well ER 12-1 Sample Results

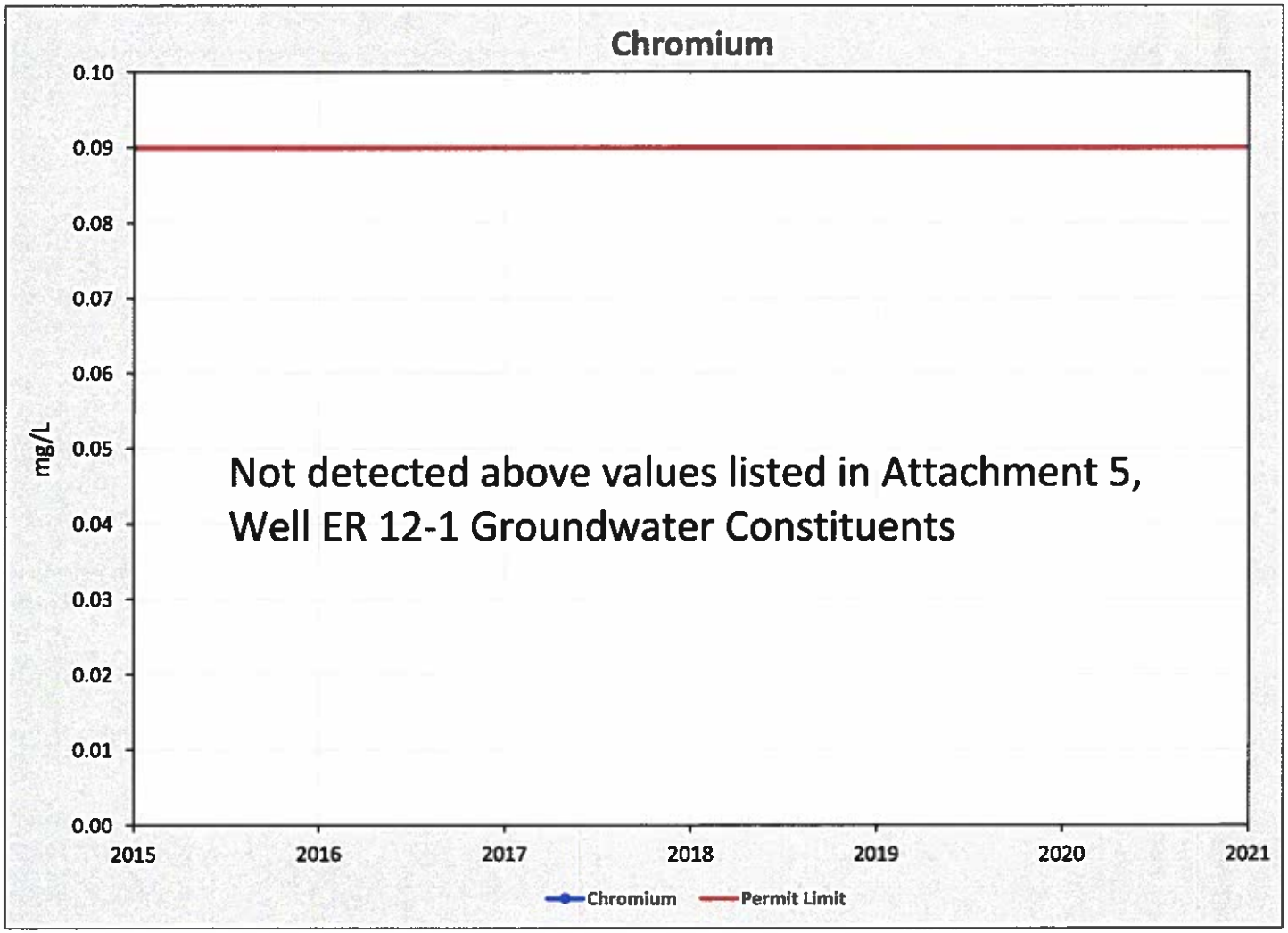


Figure 25. Chromium Well ER 12-1 Sample Results

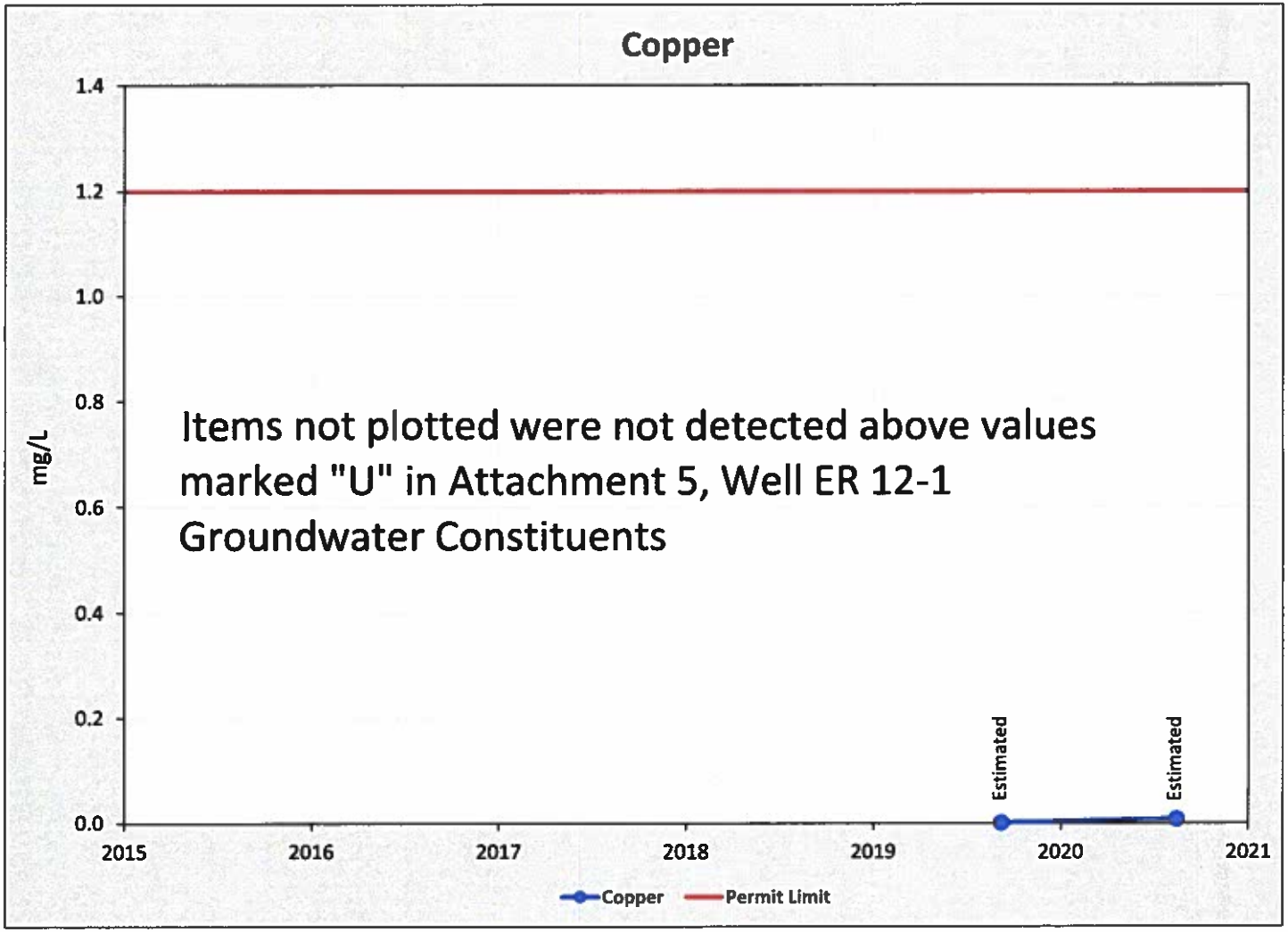


Figure 26. Copper Well ER 12-1 Sample Results

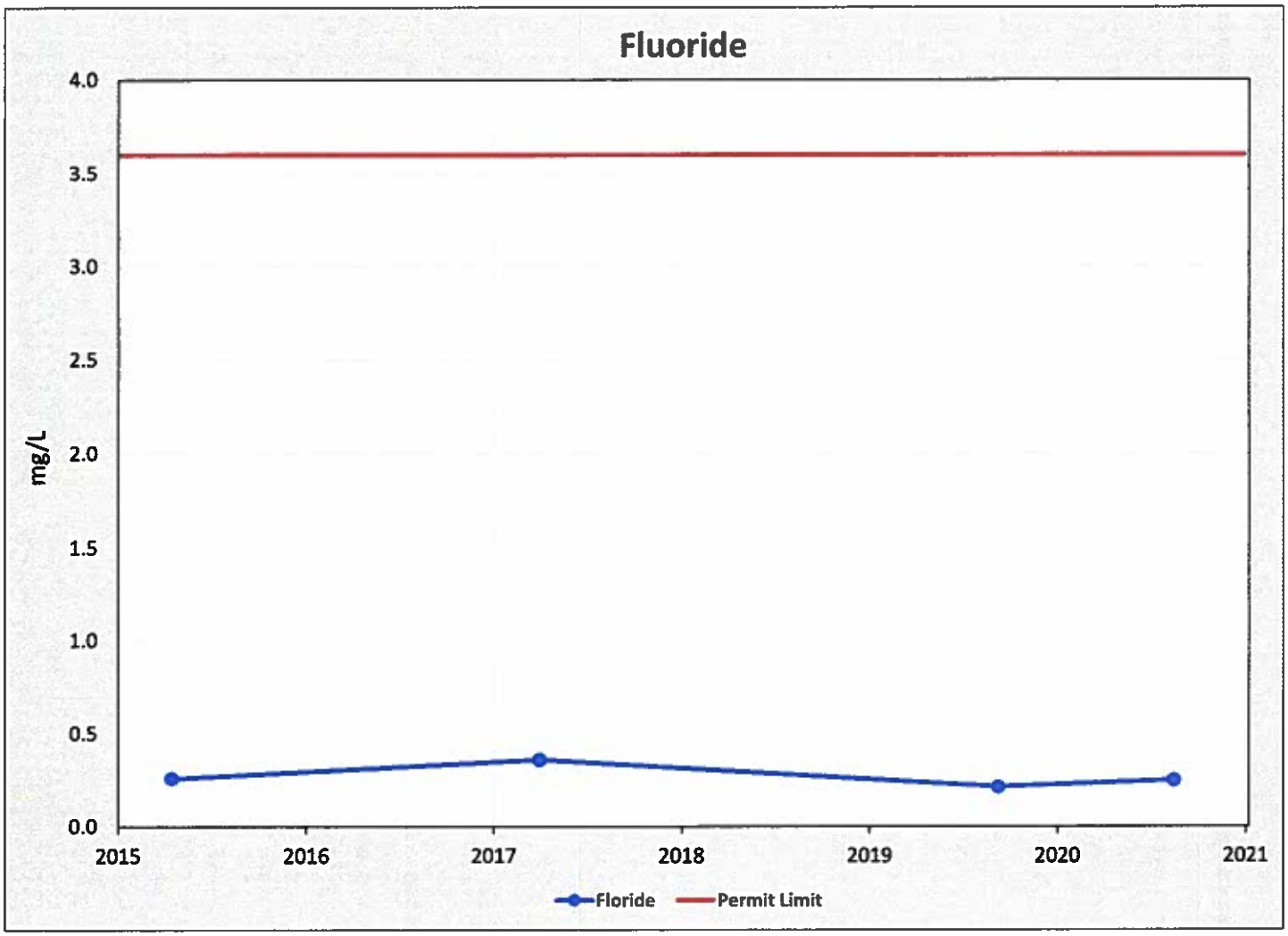


Figure 27. Fluoride Well ER 12-1 Sample Results

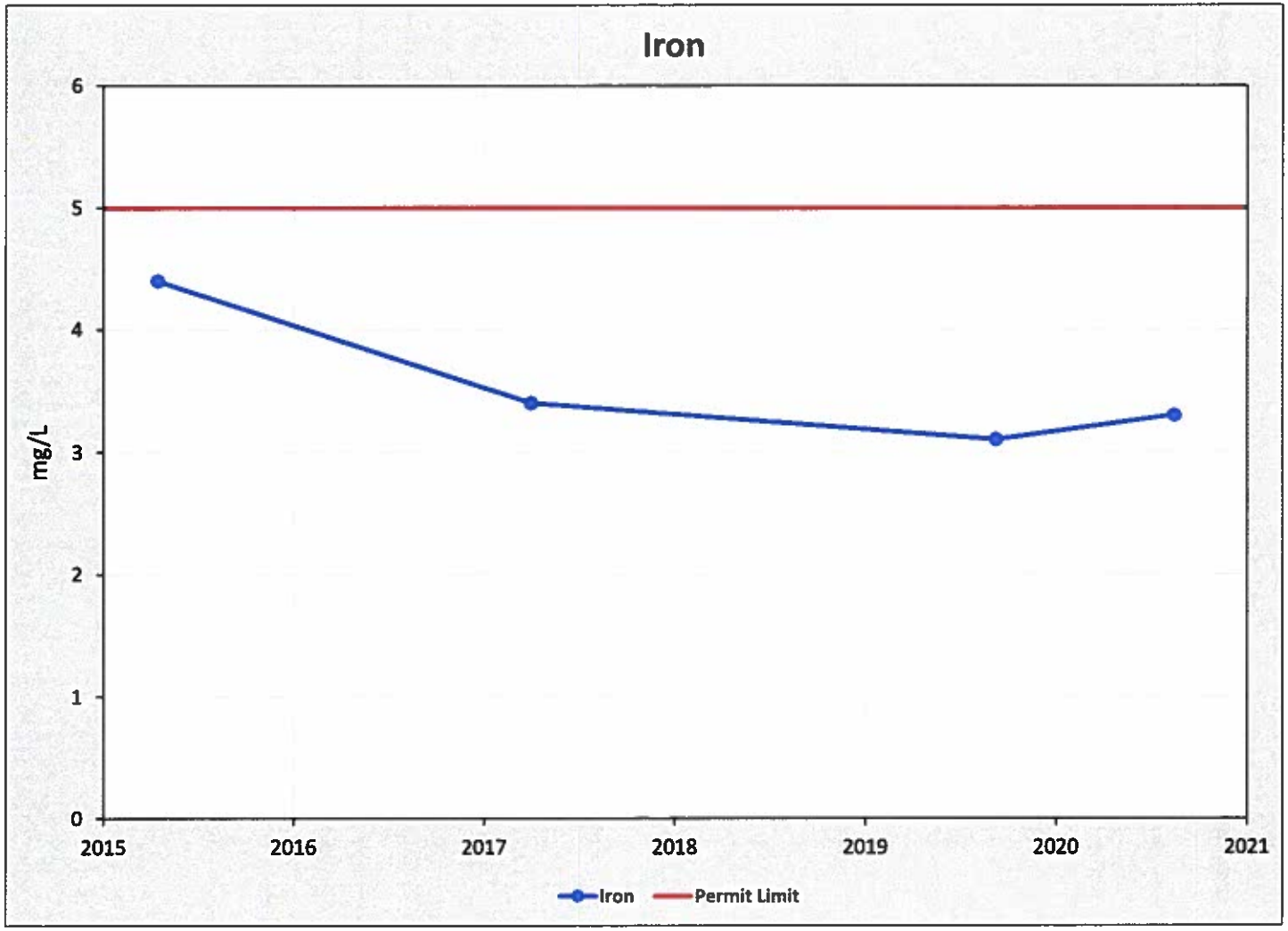


Figure 28. Iron Well ER 12-1 Sample Results

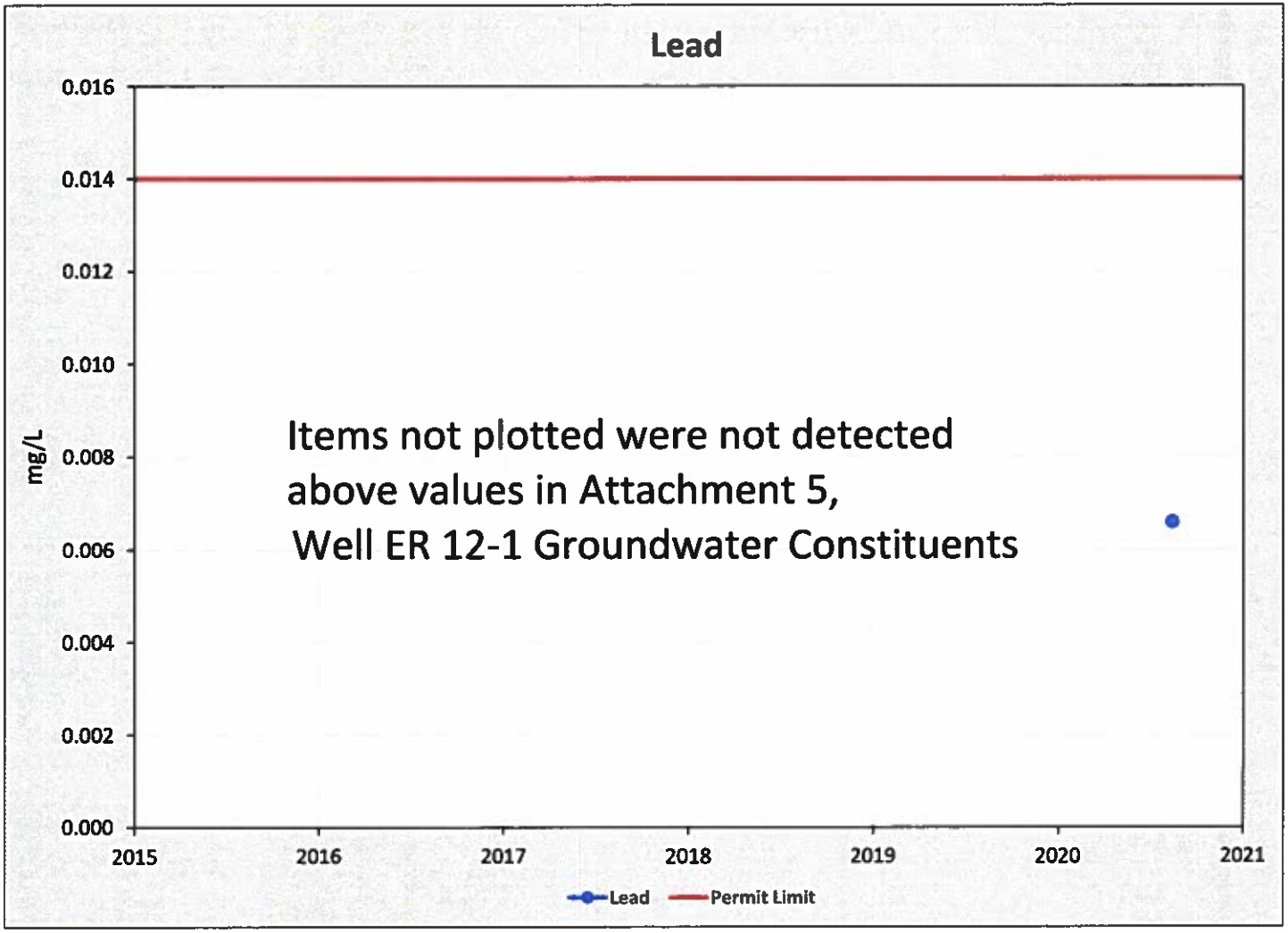


Figure 29. Lead Well ER 12-1 Sample Results

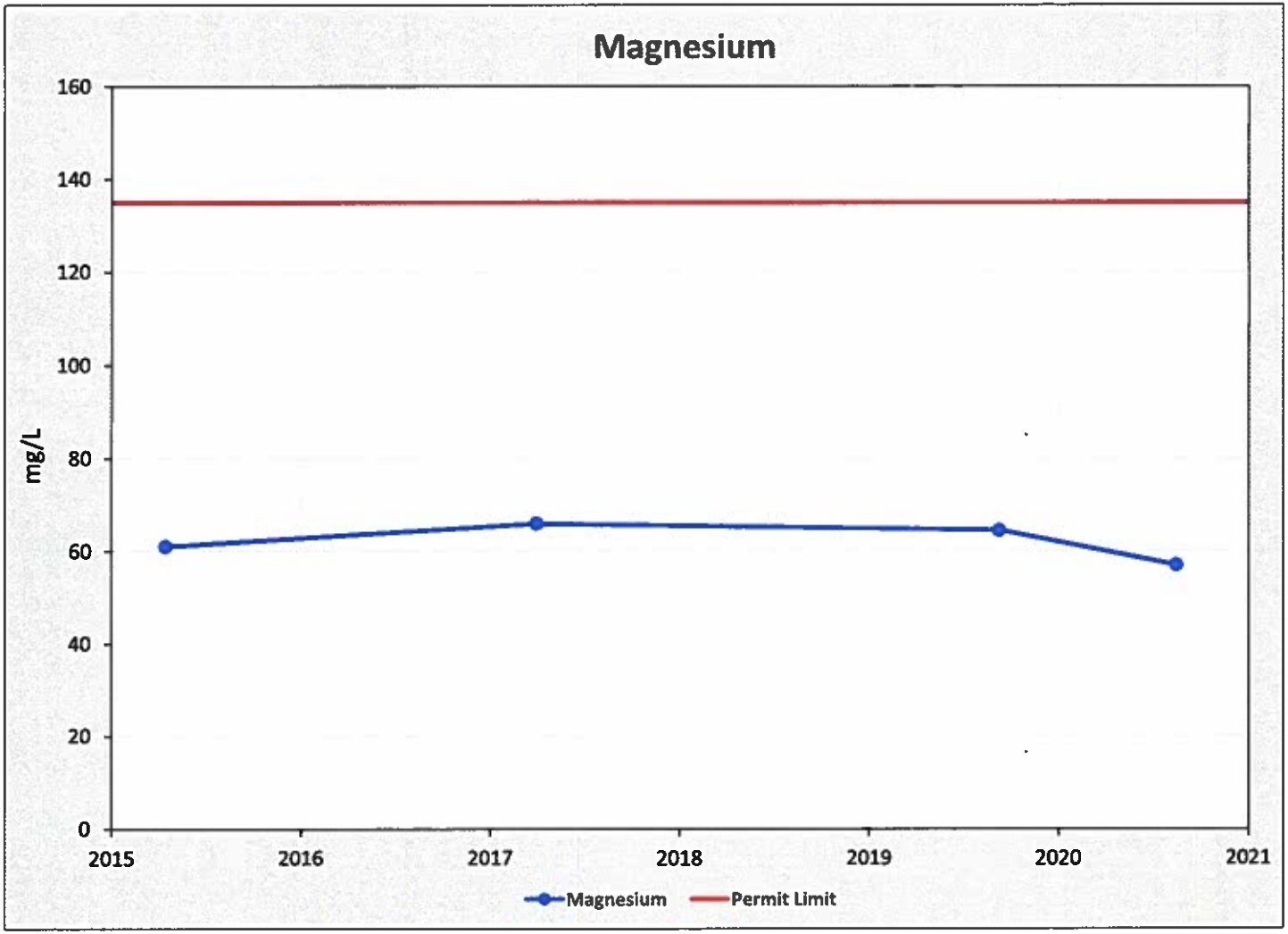


Figure 30. Magnesium Well ER 12-1 Sample Results

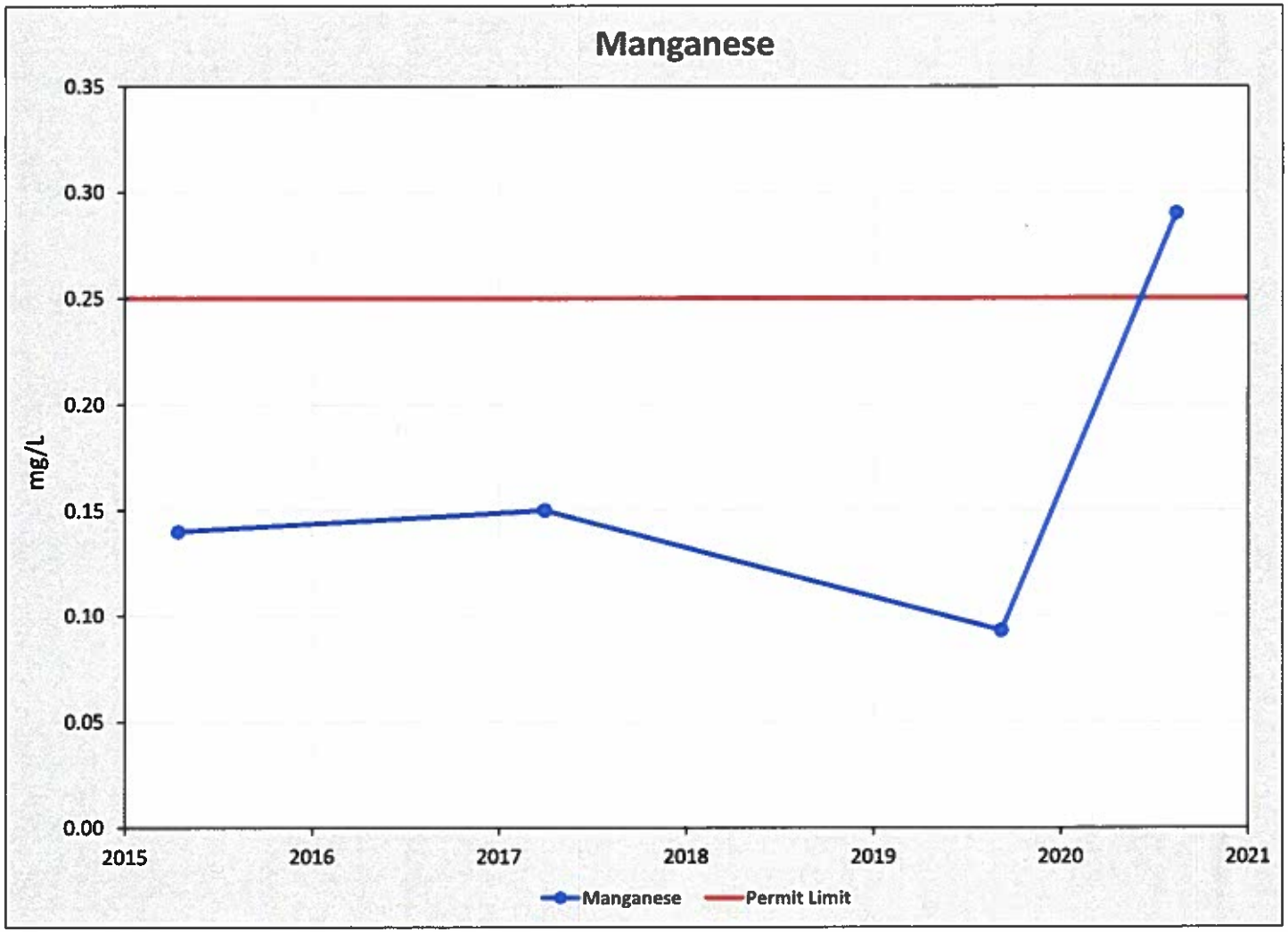


Figure 31. Manganese Well ER 12-1 Sample Results

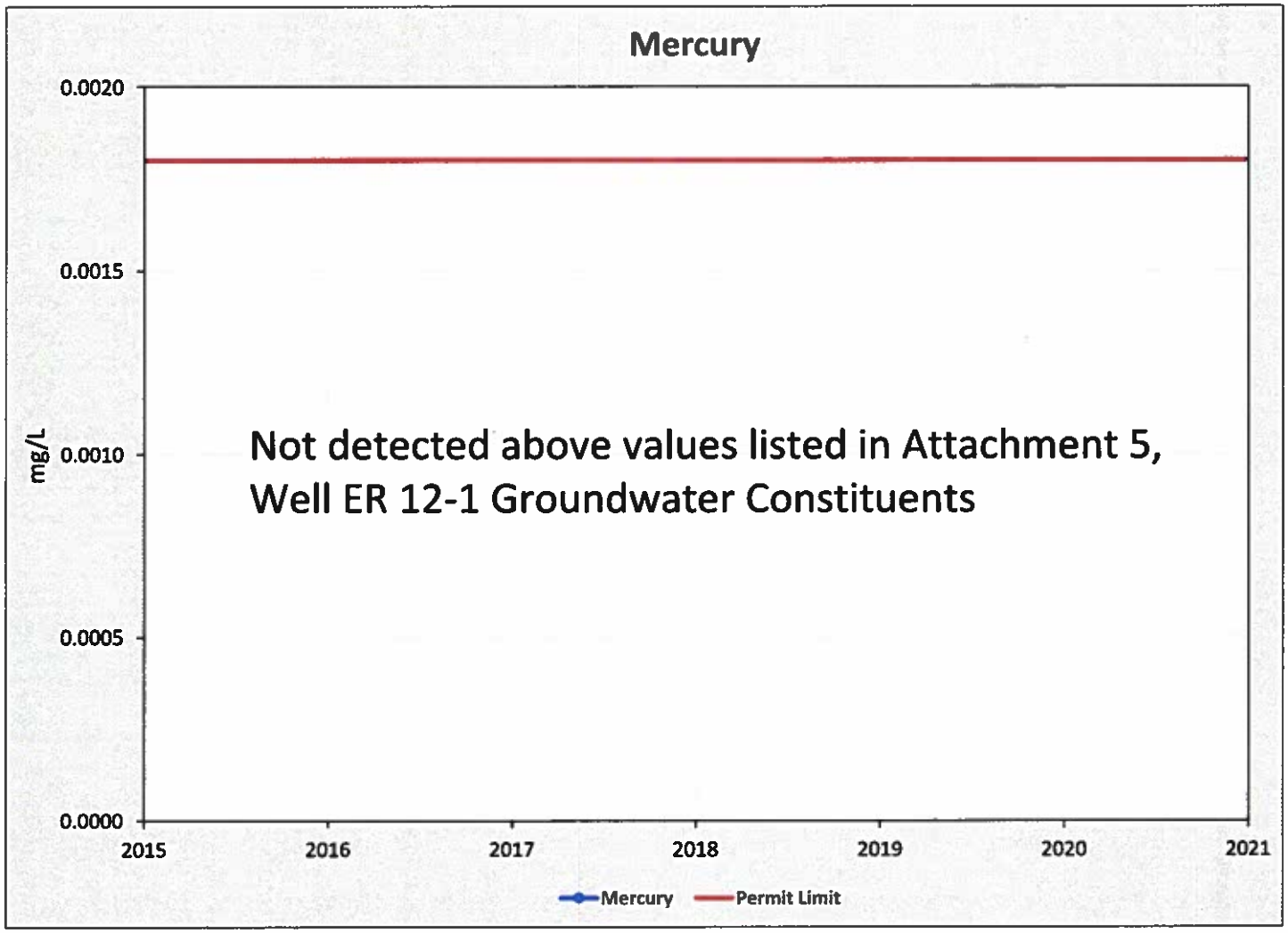


Figure 32. Mercury Well ER 12-1 Sample Results

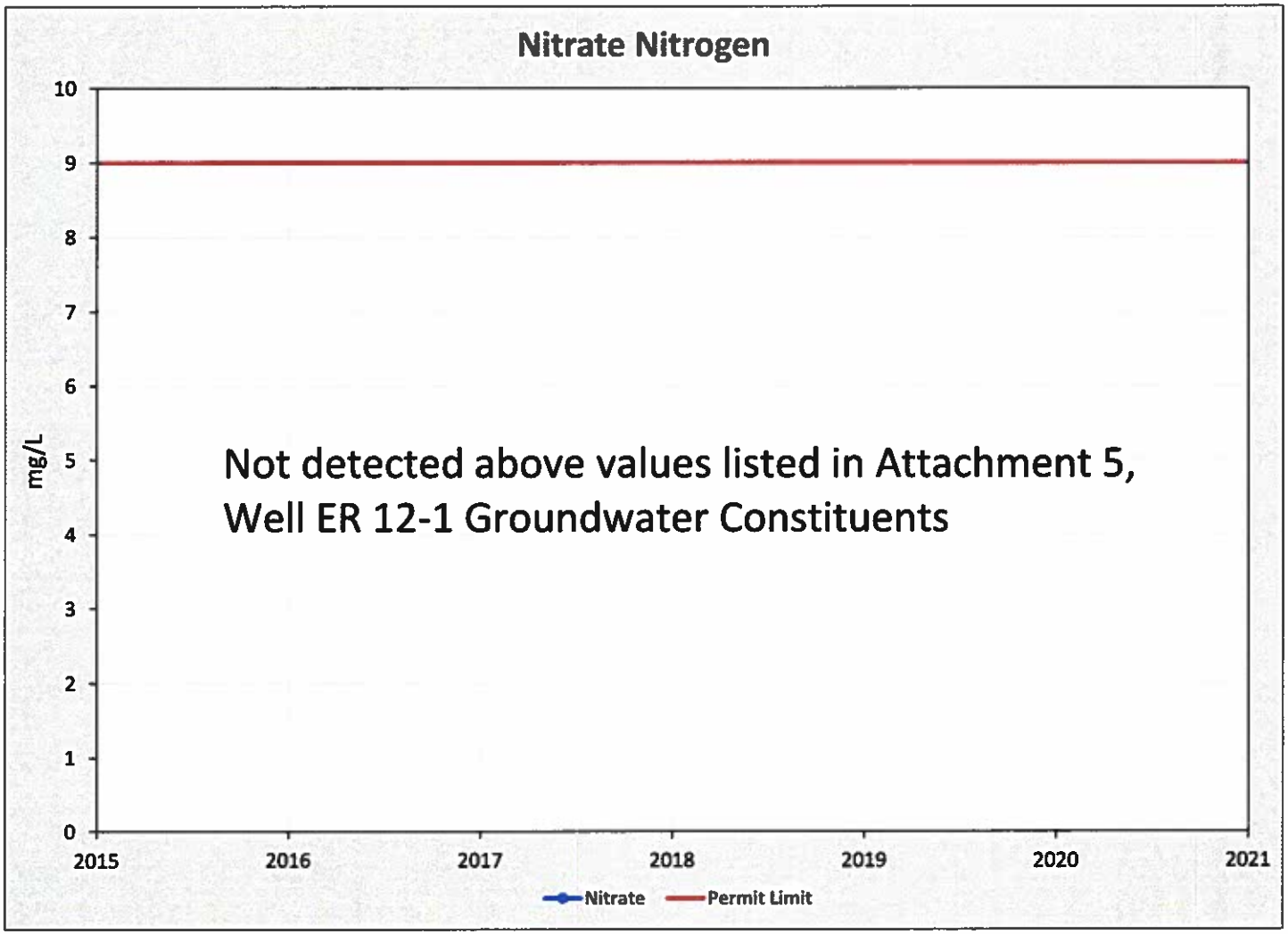


Figure 33. Nitrate Nitrogen Well ER 12-1 Sample Results

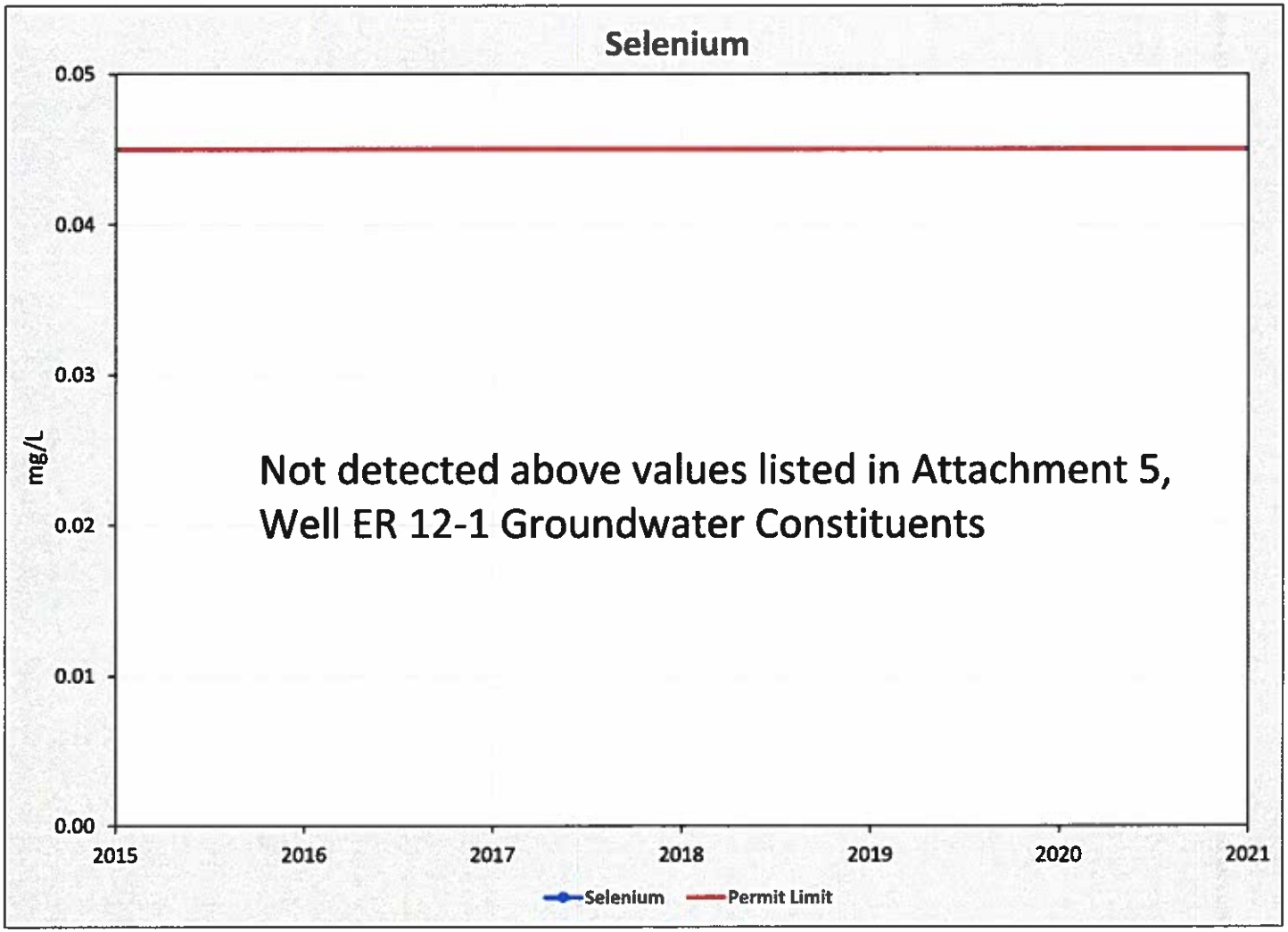


Figure 34. Selenium Well ER 12-1 Sample Results

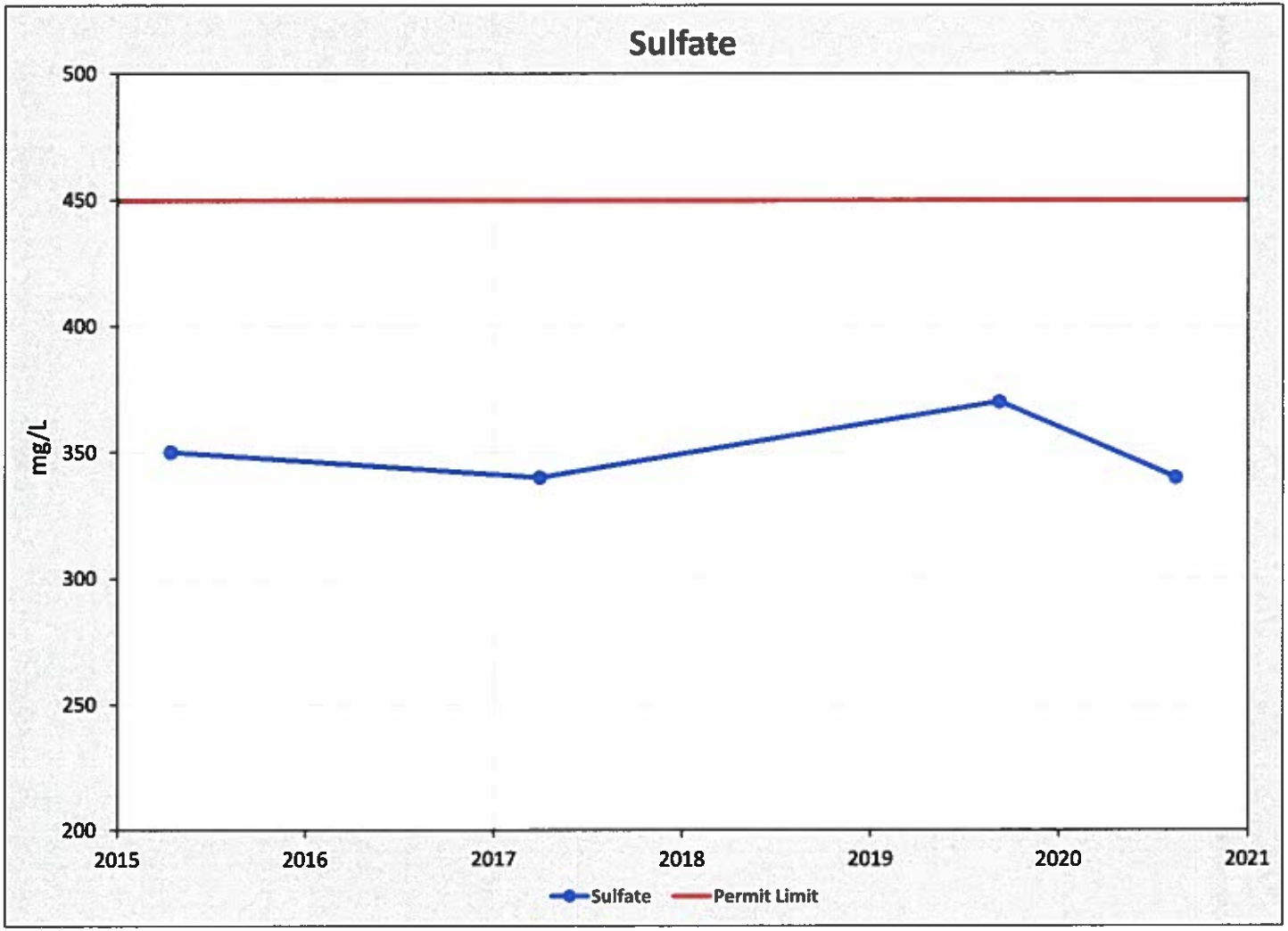


Figure 35. Sulfate Well ER 12-1 Sample Results

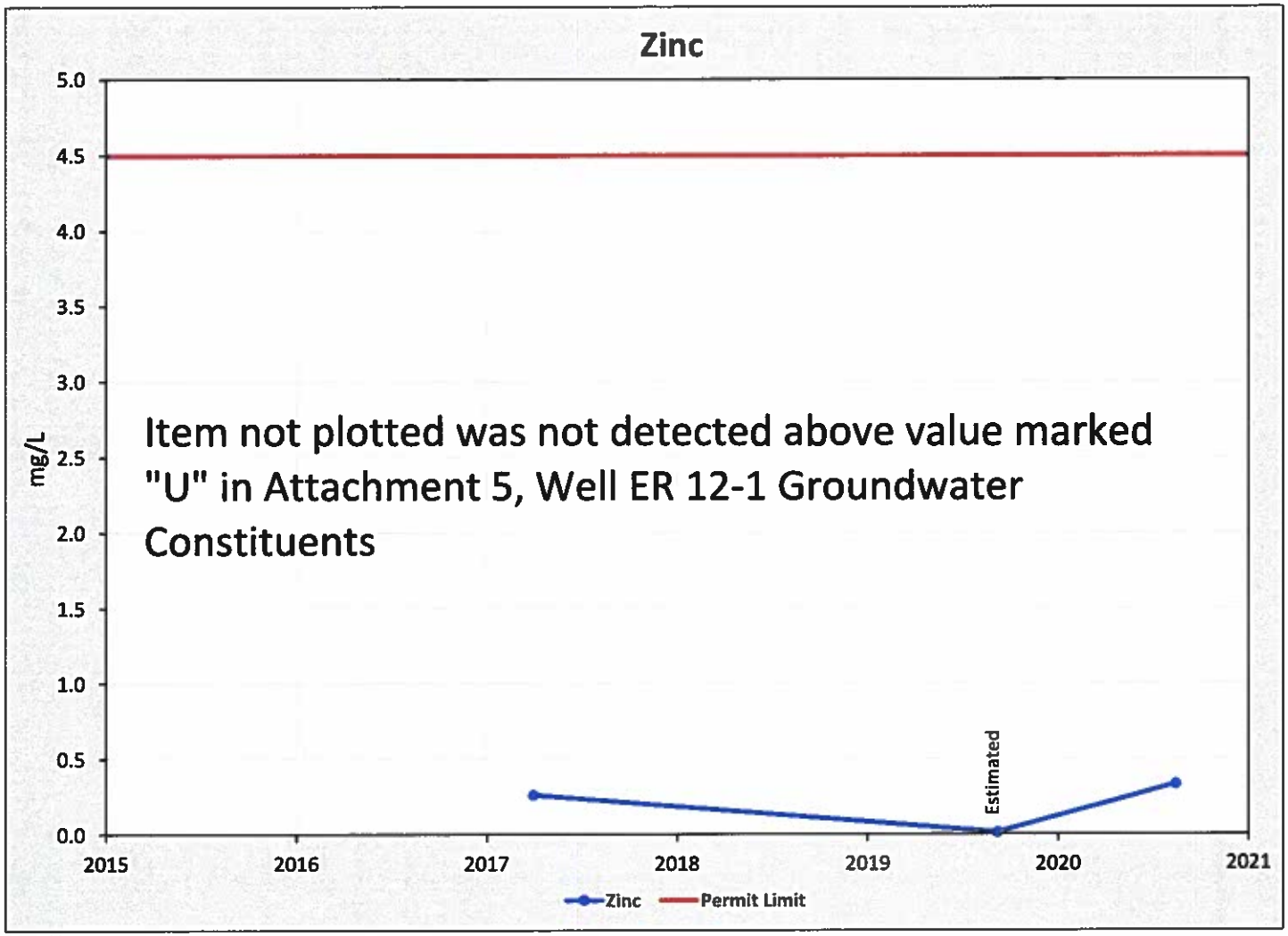


Figure 36. Zinc Well ER 12-1 Sample Results

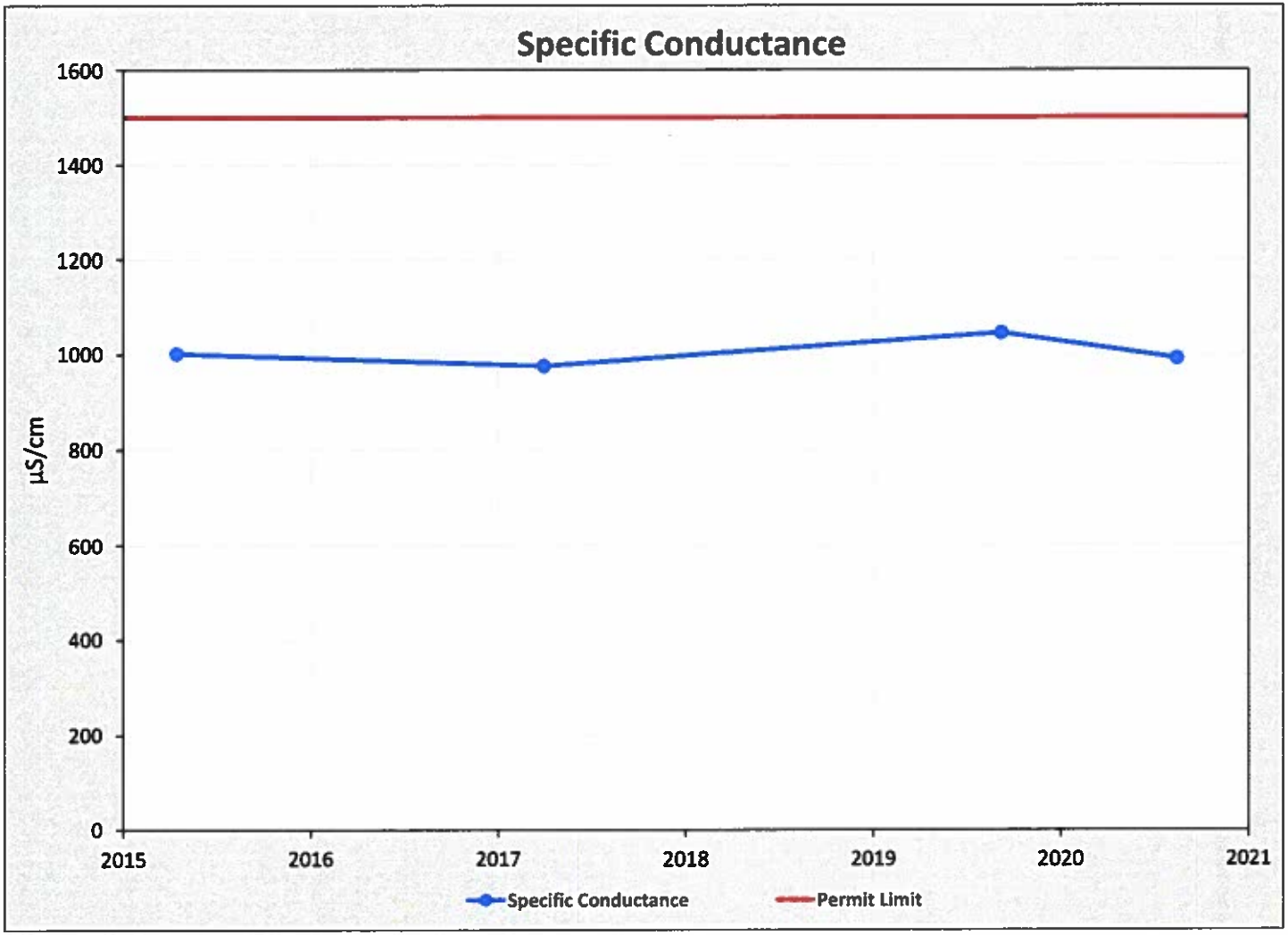


Figure 37. Specific Conductance Well ER 12-1 Sample Results

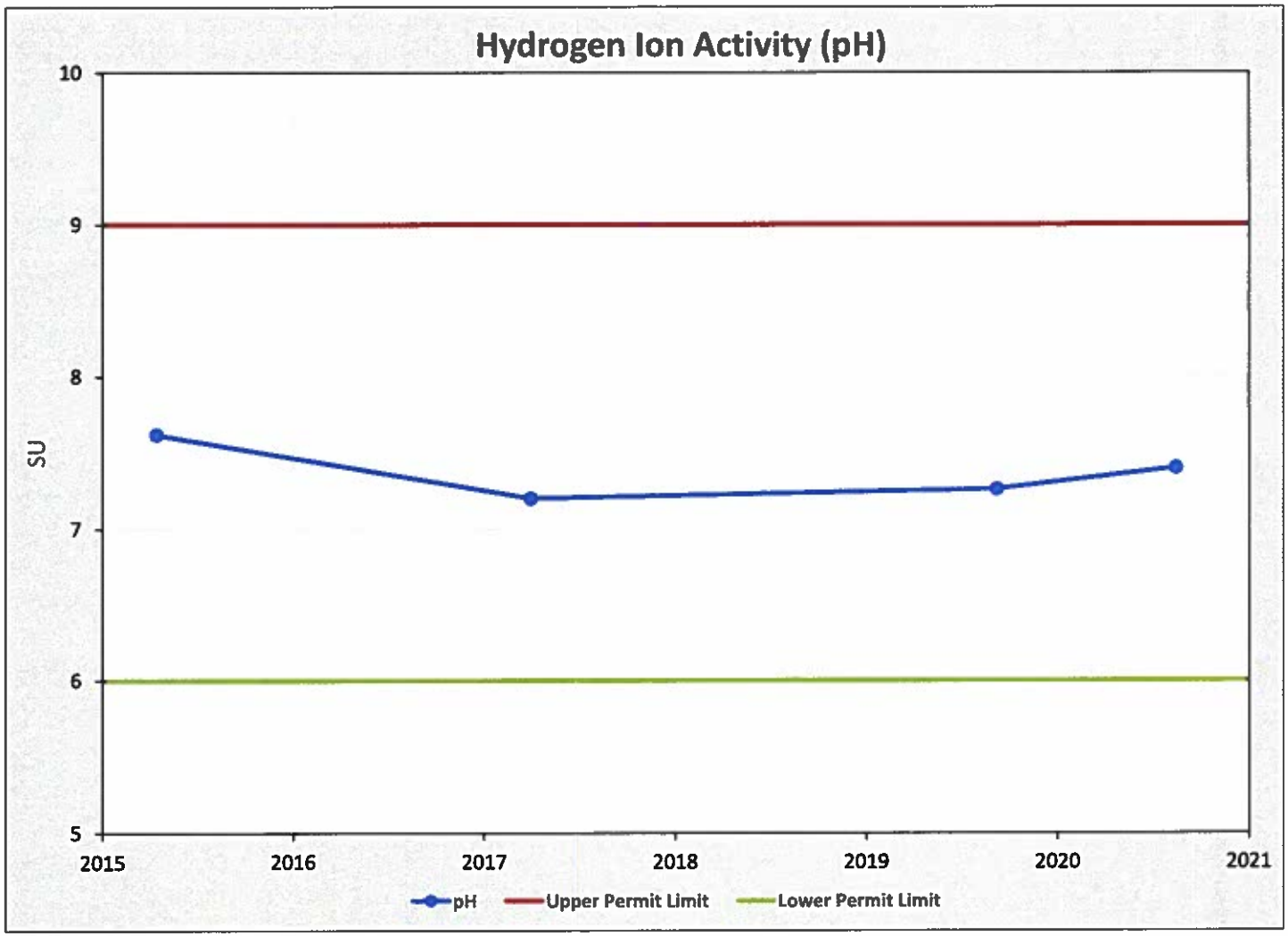


Figure 38. Hydrogen Ion Activity (pH) Well ER 12-1 Sample Results