524

~~5-600.3~~
5-601.2

COMPLIANCE WITH PERMIT RELATED SUBSTANTIVE REGULATORY REQUIREMENTS - ADVANCED WASTEWATER TREATMENT FACILITY EXPANSION PROJECT - (THIS CONTAINS A 7 PAGE REPORT WITH A SET OF LARGE DRAWINGS)

12/20/96

DOE-0316-97
DOE-FEMP EPAS
16
OU5

Department of Energy

Ohio Field Office
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155

DEC 2 0 1996
DOE-0316-97

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HSF-5J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

COMPLIANCE WITH PERMIT RELATED SUBSTANTIVE REGULATORY REQUIREMENTS - ADVANCED WASTEWATER TREATMENT FACILITY EXPANSION PROJECT

Enclosed is a Permit Information Summary for the Advanced Wastewater Treatment (AWWT) Facility Expansion Project. The purpose of this project is to install additional groundwater treatment capabilities in preparation for increased future groundwater extraction rates and to comply with mass and concentration discharge limitations established by the Operable Unit 5 (OU5) Record of Decision (ROD).

The submission of this Permit Information Summary satisfies the requirement stipulated under Task 8 of the approved Remedial Design Work Plan (RDWP). The Permit Information Summary identifies those permits that would otherwise be required, absent the exemption from administrative permitting requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(e)(1), along with the standards, requirements, criteria, or limitations that would have to be met to obtain each permit.

The AWWT Facility Expansion Project will initially provide treatment for only South Plume Groundwater. South Plume Groundwater is currently covered by the National Pollutant Discharge Elimination System (NPDES) Permit 1I000004*ED. The South Plume Groundwater was identified in the July 1994 NPDES Permit application (on which the current permit is based) as being pumped directly to the Great Miami River. The application recognized future AWWT expansions for treating contaminated groundwater. Therefore, the expansion, in and of itself, does not trigger a NPDES Permit modification. However, the

Recycled and Recyclable

NPDES Renewal Application due in October 1997 will identify the new and different groundwater sources for which this expansion will eventually provide treatment (refer to the Baseline Remedial Strategy Report for Aquifer Restoration which is currently undergoing the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) review). Please note that the Figures and Piping and Instrumentation Diagrams, identified as Attachment 2 in the enclosed Permit Information Summary, are being supplied only to the U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA) as well as their subcontractors.

If you have any questions concerning the enclosed summary, please contact Mr. John Kappa at (513) 648-3149.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosures: As Stated

cc w/encs:

S. Fauver, EM-42/CLOV
L. Griffin, EM-42/CLOV
G. Jablonowski, USEPA-V, 5HRE-8J
R. Beaumier, TPSS/DERR, OEPA-Columbus
M. Rochotte, OEPA-Columbus
F. Bell, ATSDR
D. S Ward, GeoTrans
R. Vandegrift, ODOH
S. McLellan, PRC
D. Carr, FDF/9
T. Hagen, FDF/65-2
J. Harmon, FDF/90
AR Coordinator/78

cc w/o encs:

C. Little, FDF/2
EDC, FDF/52-7

PERMIT INFORMATION SUMMARY
AWWT/AQUIFER RESTORATION PROJECT
AWWT FACILITY EXPANSION PROJECT

This permit information summary is to document the substantive permitting requirements for the Advanced Wastewater Treatment (AWWT) Facility Expansion Project. The scope and boundaries of the project include the installation of an 1,800 gpm groundwater treatment process utilizing multimedia filtration for total suspended solids (TSS) removal and ion exchange for uranium removal, aeration for iron precipitation, and the installation of tie-ins between the new AWWT expansion treatment process and existing piping, utility systems, and support systems. This scope is shown schematically in Attachment 1.

CERLCA Section 121(e)(1) states that no Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on site, where such remedial action is selected and carried out in compliance with Section 121.

Section XIII.B of the Amended Consent Agreement requires the DOE to identify those permits that would otherwise be required, along with the standards, requirements, criteria, or limitations that would have to have been met to obtain each permit.

The following summarizes the permits, permit requirements, and plans to meet those requirements for the AWWT facility expansion activities required under Task 8 of the Remedial Design Work Plan for Remedial Actions at Operable Unit 5.

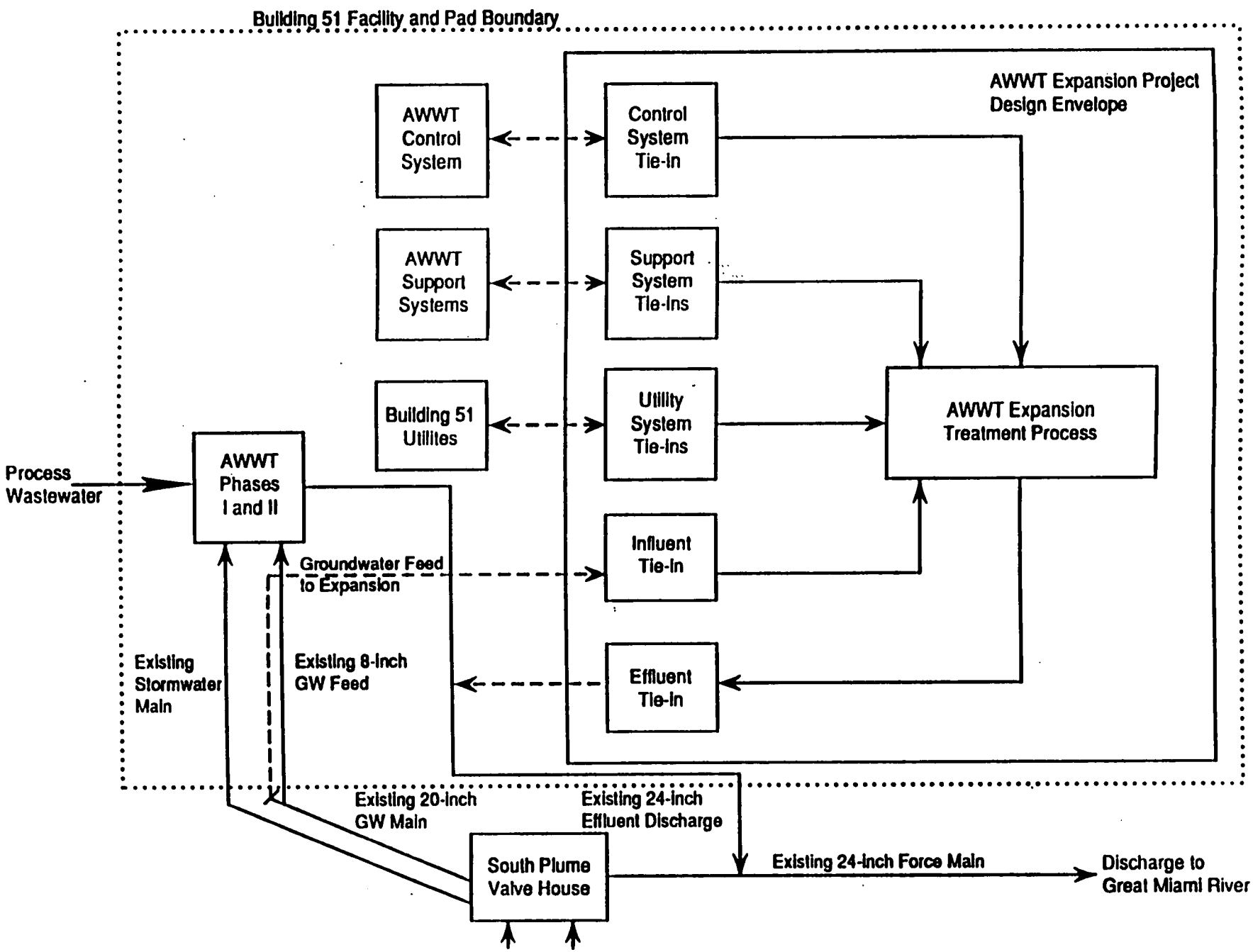
I. Identification of each permit that would otherwise be required:

<u>Federal Requirements</u>

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) - 40 CFR Part 61, Section 61.07(a): The owner or operator shall submit to the Administrator an application for approval of the construction of any new source or modification of any existing source. Unless exempted in a specific subpart, an application for approval would have to be submitted for sources subject to a National Emission Standards for Hazardous Air Pollutants (NESHAP) standard.

NATIONAL EMISSION STANDARDS FOR EMISSIONS OF RADIONUCLIDES OTHER THAN RADON FROM DOE FACILITIES - 40 CFR Part 61, Section 61.96(b): An application for approval does not have to be filed for radionuclide sources if the effective dose equivalent (EDE) caused by all emissions from the new construction or modification is less than 0.1 mrem per year. The EDE shall be determined using an approved USEPA computer model. The source term to be entered into the model to determine the necessity of an application shall be developed using Appendix D to Part 61 - Methods for Estimating Radionuclides.

ATTACHMENT 1
AWWT FACILITY EXPANSION PROJECT



State Requirements

PERMITS TO INSTALL - Ohio Administrative Code (OAC) 3745-31-02 (A): Except as provided in rule 3745-31-03 of the Administrative Code, no person shall cause, permit, or allow the installation of a new source of air pollution or a new disposal system as defined in division (G) of section 6111.01 of the Revised Code, or cause, permit, or allow the modification of an air contaminant source or a disposal system, or establish or modify a solid waste disposal facility, without first obtaining a Permit To Install from the Director.

PERMIT TO OPERATE - Ohio administrative Code (OAC) 3745-35-02 (A): Except as otherwise provided in paragraph H (Conditional Permits to Operate) of rule OAC 3745-35-2 and in OAC rules 3745-35-03 (variances) and 3745-35-05 (permit exemptions and registration status), no person may cause, permit, or allow the operation or other use of any air contaminant source without first applying for and obtaining a Permit to Operate.

II. Identification of the standards, requirements, criteria, or limitations that would have to be met to obtain each permit:

Federal Requirements

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) - 40 CFR Part 61, Subpart H, Section 61.92: Emissions of radionuclides (except $radon^{222}$ and $radon^{220}$) to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent (EDE) of 10 mrem per year.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) - 40 CFR Part 61, Subpart H, Section 61.93: Continuous measurement of radionuclide emissions is required for point sources having the potential to cause an effective dose equivalent (EDE) in excess of 0.1 mrem/yr. The EDE is determined by an approved USEPA computer model. For the purposes of determining monitoring requirements, the estimated radionuclide release rates are based on normal facility operations without the benefit of any pollution control equipment. Additionally, all radionuclides which could contribute greater than 10% of the potential EDE for a release point shall be measured.

State Requirements

AIR PERMIT TO INSTALL - Pursuant to Ohio Administrative Code (OAC) 3745-31-05, the Director of OEPA will issue an Air Permit to Install (APTI) provided the installation of the source will not prevent or interfere with the attainment or maintenance of applicable ambient air quality standards and will not result in the violation of emission standards adopted by OEPA. In accordance with OAC 3745-31-05, the sources must employ best available technology (BAT).

AIR PERMIT TO OPERATE - Pursuant to Ohio Administrative Code (OAC) 3745-35-02, the Director of OEPA will issue an Air Permit to Operate (APTO) provided the source was constructed in accordance with the terms and conditions of the Permit to Install (PTI) or, if exempted from a PTI, meets the substantive requirements of a PTI. Additionally, the source must not violate NESHAPs adopted by the Administrator of the USEPA.

WASTEWATER PERMIT TO INSTALL - Pursuant to Ohio Administrative Code (OAC) 3745-31-05, the Director of OEPA will issue a permit to install provided that the source will not prevent or interfere with the attainment or maintenance of applicable ambient water quality standards . Additionally, the source must not violate the discharge standards adopted by the Administrator or the USEPA.

III. Explanation of how the response action will meet the standards, requirements, criteria, or limitations identified in Item II above:

Federal Requirements

NESHAP SUBPART H - 40 CFR 61, SECTIONS 61.92 AND 61.93 - Emissions from the AWWT will not exceed these limits due to the low level of radionuclides present in the groundwater. Modeling of the source terms for the AWWT Facility Expansion Project using the CAP88-PC computer model, as developed under 40 CFR Part 61, Section 61.93(b)(4)(ii), yield an EDE of 2.25E-10 to the maximally exposed individual. Since the EDE is less than 0.1 mrem to the maximally exposed individual, a continuous sampler will not be required. Per 40 CFR 61.96(b), new or modified sources of radionuclides whose EDEs are determined to be less than the 0.1 mrem per year to the maximally exposed individual criteria are not required to submit applications for approval to the USEPA.

State Requirements

AIR PERMITS TO INSTALL AND OPERATE - It is not expected that the AWWT Facility Expansion Project will result in an appreciable increase in emissions from the existing AWWT facility. The system will meet BAT requirements All tanks associated with the multimedia filtration and ion exchange columns operate under pressure in a closed system. The aeration tank which is vented to the atmosphere contains aerated water. No chemical addition or storage and no particulate generating activities are associated with the normal operation of this project.

WASTEWATER PERMIT TO INSTALL - The AWWT Facility Expansion Project involves the installation of three 900 gpm pumps (two of which will operate while the third is off -line), an aeration tank, a multimedia filtration system for removing 90% of the TSS larger than 10 microns, and three trains of two ion exchange columns in parallel for reducing the uranium content in the stream from 300-500 ppb to less than 20 ppb. The project will make use of existing piping, utility systems, and AWWT support systems to the maximum extent practicable, while remaining within planned operation and control strategies. Attachment 2 contains key selected drawings associated with the AWWT Facility Expansion Project which give a general perspective of the proposed expansion.

ATTACHMENT 2
AWWT FACILITY EXPANSION DRAWINGS

Included in this attachment are the following drawings associated with the AWWT facility expansion project:

95X-5900-G-00315 - Civil Site/Utility Plan AWWT Facility Area

95X-5900-F-00330 - Process Flow Diagram

95X-5900-N-00278 - Piping and Instrumentation Diagram

95X-5900-N-00279 - Piping and Instrumentation Diagram

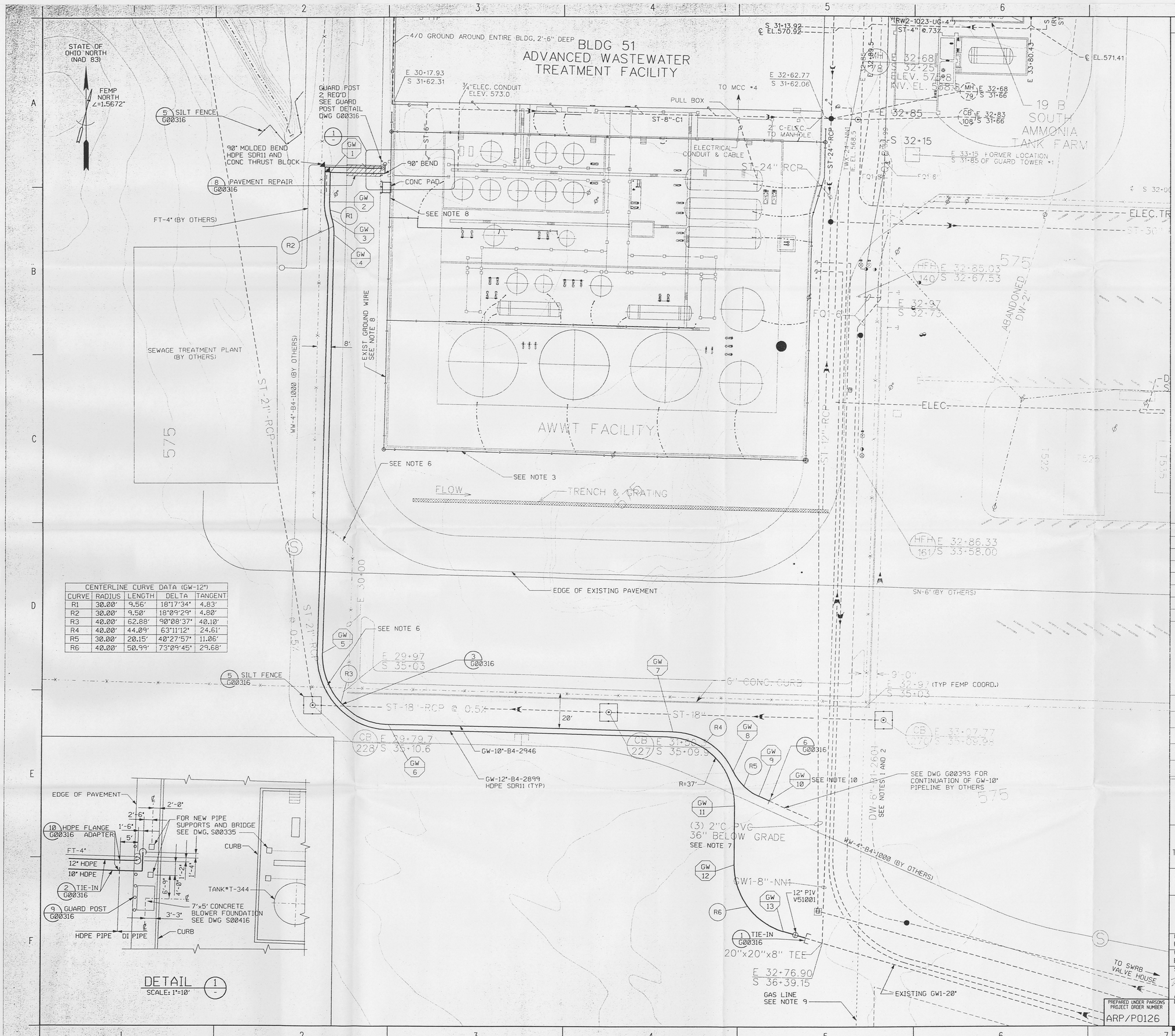
95X-5900-N-00280 - Piping and Instrumentation Diagram

95X-5900-N-00281 - Piping and Instrumentation Diagram

95X-5900-N-00282 - Piping and Instrumentation Diagram

95X-5900-N-00283 - Piping and Instrumentation Diagram

95X-5900-N-00362 - Piping and Instrumentation Diagram



CENTERLINE CURVE DATA (GW-12")				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
R1	30.00'	9.56'	18°17'34"	4.83'
R2	30.00'	9.50'	18°09'29"	4.80'
R3	40.00'	62.88'	90°08'37"	40.10'
R4	40.00'	44.09'	63°11'12"	24.61'
R5	30.00'	20.15'	40°27'57"	11.06'
R6	40.00'	50.99'	73°09'45"	29.68'

DETAIL 1
SCALE: 1"=10'

NOTES

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1. EXISTING CONDITIONS SHOWN ON THIS DRAWING WERE PREPARED FROM FEMP SITE PROVIDED DOCUMENTS LISTED BELOW:
   PARSONS TOPOGRAPHY 1992
   FEMP CADD GRID/UTILITY DRAWINGS
   FEMP CONTRACTOR PROJECT DESIGN DOCUMENTS
2. 6" PUBLIC WATER SUPPLY LINE IDENTIFIED IN FIELD BY POSTED SIGNS AND MAGNETIC TRACE WIRE.
3. LOCATION AND DEPTH OF SURFACE FEATURES AND UTILITIES ARE APPROXIMATE. SUBCONTRACTOR IS TO LOCATE FEATURES AND UTILITIES PRIOR TO EXCAVATION FOR CONSTRUCTION. IF LOCATION AND DEPTH ARE DIFFERENT OR UNKNOWN UNCHARTED UTILITIES ARE DISCOVERED. SUBCONTRACTOR IS TO INFORM FERMCO BEFORE PROCEEDING. TOPOGRAPHY OF AREA IS NOT AVAILABLE.
4. UNLESS OTHERWISE NOTED, ALL MATERIALS SHALL CONFORM TO THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION (ODOT) CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 1996.
5. ALL DISTURBED SURFACES SHALL BE SEEDED AT PROJECT COMPLETION UNLESS OTHERWISE NOTED.
6. SUBCONTRACTOR SHALL COORDINATE THE TEMPORARY REMOVAL OF EXISTING CHAIN LINK FENCE WITH FERMCO. SUBCONTRACTOR SHALL REPLACE FENCE AT COMPLETION OF TRENCH BACKFILL, AS NECESSARY.
7. AS-BUILT DRAWING FROM FERMCO INDICATES "1-1" PVC CONDUITS RUN UNDERGROUND FROM PULLBOX (NEAR SWRB VALVE HOUSE) TO BLDG 51. CONDUIT TO FOLLOW ROUTING OF UNDERGROUND PIPING FROM VALVE HOUSE." SUBCONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
8. THE GROUND WIRE SHOWN FROM RECORD DRAWINGS. SUBCONTRACTOR SHALL LOCATE THE GROUND WIRE AND RELOCATE IT AS NECESSARY FOR THE PIPE OR PIPE SUPPORT PIER. SEE DRAWING 95X-5900-E-00303 FOR ADDITIONAL INFORMATION.
9. A FUEL GAS LINE IS IN THIS AREA. SUBCONTRACTOR IS TO IDENTIFY LOCATION PRIOR TO CONSTRUCTION.
10. INSTALL A POST AND SIGN INDICATING LOCATION OF BLIND FLANGE.

UNDERGROUND UTILITY COORDINATES (GW)			
POINT	NORTHING	EASTING	DESCRIPTION
1	479529.98	1348002.14	90° BEND
2	479513.17	1348001.69	POINT OF CURVE
3	479503.72	1348002.92	POINT OF REVERSE CURVE
4	479494.33	1348004.16	POINT OF TANGENT
5	479253.31	1347997.58	POINT OF CURVE
6	479212.23	1348036.57	POINT OF TANGENT
7	479208.20	1348199.19	POINT OF CURVE
8	479185.36	1348234.34	POINT OF REVERSE CURVE
9	479170.85	1348249.18	POINT OF TANGENT
10	479168.15	1348255.20	END PIPE AT FLANGE
11	479165.37	1348235.21	POINT OF TANGENT
12	479131.50	1348235.28	POINT OF CURVE
13	479093.28	1348263.72	POINT OF TANGENT

REF DWG NO.	DRAWING TITLE
95X-5900-X-00318	DRAWING INDEX
95X-5900-X-00319	LEGEND AND SYMBOLS
95X-5900-G-00316	DETAILS
95X-5900-S-00336	SECTIONS AND DETAILS
95X-5900-E-00303	POWER AND INSTRUMENT PLAN
95X-5900-S-00335	PLAN-ION EXCHANGE PLATFORM AND PIPE SUPPORT
95X-5900-S-00416	PLANS, SECTIONS, AND DETAILS

INFORMATION ONLY

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		NA	9/30/96

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCE WASTE WATER TREATMENT EXPANSION PROJECT

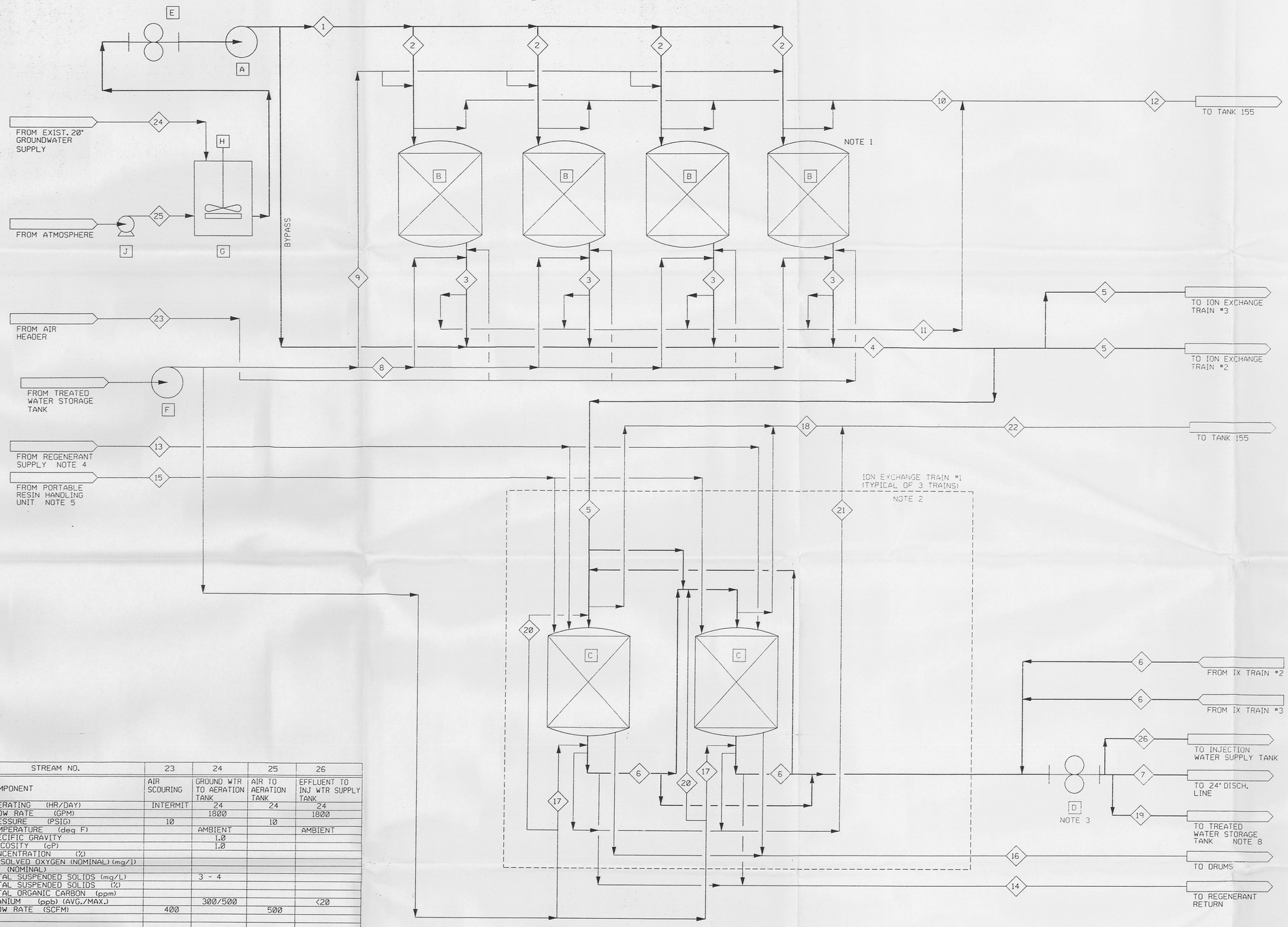
DRAWING TITLE
CIVIL
SITE/UTILITY PLAN
AWWT FACILITY AREA

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
R. ESPARZA	09-28-95			E. KUBRIN	12-28-95

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG 51		1"=20'	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NO.
9/30/96	NA	54500 8
A-E DATE	DATE	

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-G-00315	G0001	0



NOTES

524

1. THREE MULTI-MEDIA FILTERS IN OPERATION. ONE IN STANDBY.
2. THREE TRAINS OF ION EXCHANGE COLUMNS IN PARALLEL; TWO COLUMNS IN SERIES PER TRAIN.
3. DUPLEX IN-LINE STRAINER PROVIDED TO CATCH CARRY OVER OF RESIN BEADS.
4. REGENERANT FLOW RATE BASED ON 0.5 GPM PER CUBIC FOOT OF RESIN BED. REGENERANT TIME ESTIMATED AT 45 MINUTES. BASED ON 3 BED VOLUMES OF REGENERANT. FLOW APPLIES TO SINGLE COLUMN.
5. USAGE AND DEPLETION RATES OF ION EXCHANGE RESIN WILL BE DEVELOPED ONCE THE ACTUAL OPERATING DATA FROM THE EXISTNG SYSTEM IS AVAILABLE.
6. 157 GPM FOR SLOW RINSE OF ION EXCHANGE COLUMN ESTIMATED TIME 16 MIN.
   600 GPM FOR FAST RINSE OF ION EXCHANGE COLUMN ESTIMATED TIME 22 MIN.
7. ACCURATE FREQUENCY OF MULTI-MEDIA FILTER BACKWASH AND RINSE WILL BE DEVELOPED ONCE THE ACTUAL OPERATING DATA FROM THE SYSTEM IS AVAILABLE. FOR MATERIAL BALANCE CALCULATION BACK-WASH/RINSE CYCLE ESTIMATED TO OCCUR EVERY DAY; BACKWASH TO LAST 12 MINUTES. RINSE 5 MINUTES. FLOW APPLIES TO SINGLE MULTIMEDIA FILTER.
8. TREATED WATER EFFLUENT WILL BE USED TO SUPPLY THE TREATED WATER STORAGE TANK.
9. FLOW APPLIES TO SINGLE COLUMN.
10. ESTIMATED TIME FOR SCOURING. 5 MINUTES PRIOR TO BACKWASH.
11. INITIAL OPERATION FOR STREAM 26 WILL BE 1000 GPM, COMBINED FLOW THROUGH 26, 7, AND 19 WILL BE 1800 GPM.

MAJOR EQUIPMENT LIST

MARK	QTY	EQUIPMENT NAME
A	3	GROUNDWATER SUPPLY PUMP
B	4	MULTI-MEDIA FILTER
C	6	ION EXCHANGE COLUMN
D	1	60 MESH DUPLEX IN-LINE STRAINER
E	1	1/8" DUPLEX IN-LINE STRAINER
F	4	BACKWASH SUPPLY PUMP
G	1	AERATION TANK
H	1	AERATION TANK AGITATOR AND SPARGE RING
J	1	AERATION TANK BLOWER

REFER DWG NO.	REFERENCE DWG TITLE
95X-5900-X-00318	DRAWING INDEX
95X-5900-N-00278	SYMBOLS AND LEGEND SHEET

LEGEND

——— MAIN PROCESS FLOW LINES

——— SECONDARY PROCESS OR SERVICE LINES

INFORMATION ONLY

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		N/A	7/30/96

INITIALS AND DATE

STREAM NO.	23	24	25	26
COMPONENT	AIR SCOURING	GROUND WTR TO AERATION TANK	AIR TO AERATION TANK	EFFLUENT TO INJ WTR SUPPLY TANK
OPERATING (HR/DAY)	INTERMIT	24	24	24
FLOW RATE (GPM)		1800		1800
PRESSURE (PSIG)	10		10	
TEMPERATURE (deg F)		AMBIENT		AMBIENT
SPECIFIC GRAVITY		1.0		
VISCOSITY (cP)		1.0		
CONCENTRATION (%)				
DISSOLVED OXYGEN (NOMINAL) (mg/l)				
pH (NOMINAL)				
TOTAL SUSPENDED SOLIDS (mg/L)		3 - 4		
TOTAL SUSPENDED SOLIDS (%)				
TOTAL ORGANIC CARBON (ppm)				
URANIUM (ppb) (AVG./MAX.)		300/500		<20
FLOW RATE (SCFM)	400		500	
NOTES	10			11

STREAM NO.	1	2	3	4	5	6	7	8	9	10	11	12
COMPONENT	GROUND WTR TO M. MEDIA FILTERS	M.MEDIA FILTER FEED	M. MEDIA FILTER DISCHARGE	TOTAL FILTER DISCHARGE	ION EXCH. COLUMN FEED	ION EXCH. COLUMN DISCHARGE	TOTAL TO 24" LINE	FILTER BACKWASH SUPPLY	FILTER RINSE SUPPLY	FILTER BACKWASH DISCHARGE	FILTER RINSE DISCHARGE	BACKWASH/ RINSE DISCHARGE
OPERATING (HR/DAY)	24	24	24	24	24	24	24	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT
FLOW RATE (GPM)	1800	600	600	1800	600	600	1800	1100	600	1100	600	600/1100
PRESSURE (PSIG)												
TEMPERATURE (deg F)	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT
SPECIFIC GRAVITY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VISCOSITY (cP)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CONCENTRATION (%)												
DISSOLVED OXYGEN (NOMINAL) (mg/l)												
pH (NOMINAL)												
TOTAL SUSPENDED SOLIDS (mg/L)	3 - 4	3 - 4	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4	0.3 - 0.4					
TOTAL SUSPENDED SOLIDS (%)										0.07		0.07
TOTAL ORGANIC CARBON (ppm)												
URANIUM (ppb) (AVG./MAX.)	300/500	300/500	300/500	300/500	300/500	<20	<20					
FLOW RATE (SCFM)												
NOTES							11	7	7	7	7	7

STREAM NO.	13	14	15	16	17	18	19	20	21	22
COMPONENT	ION EXCH. REGEN SUPPLY	ION EXCH. REGEN RETURN	NEW RESIN SUPPLY	SPENT RESIN DISCHARGE	ION EXCH. BACKWASH SUPPLY	ION EXCH. BACKWASH RETURN	EFFLUENT TO TREAT WTR STG	ION EXCH. RINSE SUPPLY	ION EXCH. RINSE DISCHARGE	BACKWASH/ RINSE DISCHARGE
OPERATING (HR/DAY)	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT	INTERMIT
FLOW RATE (GPM)	160	160	TBD	TBD	240	240	600	160/600	160/600	160/600
PRESSURE (PSIG)										
TEMPERATURE (deg F)	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT	AMBIENT
SPECIFIC GRAVITY	TBD	TBD			1.0	1.0	1.0	1.0	1.0	1.0
VISCOSITY (cP)	TBD	TBD			1.0	1.0	1.0	1.0	1.0	1.0
CONCENTRATION (%)										
DISSOLVED OXYGEN (NOMINAL) (mg/l)										
pH (NOMINAL)										
TOTAL SUSPENDED SOLIDS (mg/L)										
TOTAL SUSPENDED SOLIDS (%)		NEG				NEG	NEG			
TOTAL ORGANIC CARBON (ppm)										
URANIUM (ppb) (AVG./MAX.)							<20			
FLOW RATE (SCFM)										
NOTES	4	4	5	5	9	9	8	6	6	6

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY

PARSONS

THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME: ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

DRAWING TITLE: PROCESS PROCESS FLOW DIAGRAM FILTRATION AND ION EXCHANGE

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
D.P. MIRE	04/25/95	S. Fekete	8/20/96	R.C. TAYLOR	05/17/95

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BUILDING 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NO.
7/30/96 (A-E DATE)	NA (DATE)	54500

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-F-00330	F0001	0

PIPING SYMBOLS

- GATE VALVE
- GLOBE VALVE
- BALL VALVE
- PLUG VALVE
- BUTTERFLY VALVE/DAMPER
- STOP CHECK
- NEEDLE VALVE
- CHECK VALVE
- SLIDING GATE VALVE
- BALL CHECK VALVE
- BACKFLOW PREVENTER
- DIAPHRAGM VALVE
- PINCH VALVE
- 3 WAY VALVE
- 3 WAY BALL VALVE
- 3 WAY PLUG VALVE
- ANGLE GATE VALVE
- ANGLE GLOBE VALVE
- FOOT VALVE
- HUB DRAIN OR FUNNEL
- DIAPHRAGM OPERATOR
- DIAPHRAGM W/ POSITIONER
- PISTON OPERATOR
- SAFETY RELIEF VALVE
- SOLENOID OPERATOR
- SELF-CONTAINED BACK PRESSURE REGULATING VALVE
- 2-WAY SOLENOID VALVE
- 3-WAY SOLENOID VALVE (ARROW INDICATES DE-ENERGIZED FLOW PATH)
- 4-WAY SOLENOID VALVE
- VALVE WITH OPERATOR (VALVE TYPE UNDEFINED)
- STEAM TRAP
- HOSE QUICK COUPLING
- UNION
- DRAIN LEG
- EXPANSION JOINT
- HANDWHEEL
- EJECTOR
- STRAINER (Y TYPE)
- STRAINER (SINGLE BASKET)
- STRAINER (DOUBLE BASKET)
- STRAINER (CONE TYPE)
- STRAINER (SUCTION TYPE)
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- ORIFICE
- VENTURI TUBE
- FLOW STRAIGHTENING VANE
- SIPHON TUBE
- THERMOWELL
- FLOW DIRECTION
- WELDED CONNECTION
- FLANGED CONNECTION
- FLEXIBLE HOSE
- PIPE CAP
- TIE/IN MARK
- PRIMARY
- SECONDARY
- EXISTING PIPING OR EQUIPMENT
- UNDERGROUND
- PACKAGED SYSTEM
- PIPING MATERIAL BREAK
- PIPING INSULATION BREAK
- PULSATION DAMPENER
- AIR FILTER
- FILTER LUBRICATOR REGULATOR
- AIR OPERATED DIAPHRAGM PUMP
- HORIZONTAL CENTRIFUGAL PUMP
- VERTICAL CENTRIFUGAL PUMP
- SUMP PUMP
- CHEMICAL METERING PUMP
- AGITATOR (MIXER)
- PACKAGE SYSTEM/FIELD BREAK
- AIR RELEASE VALVE

INSTRUMENT SYMBOLS

- ELECTRICAL BINARY SIGNAL
- PNEUMATIC BINARY SIGNAL
- ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)
- ELECTROMAGNETIC OR SONIC SIGNAL (NON-GUIDED)
- ELECTRICAL SIGNAL
- DATA HIGHWAY
- CAPILLARY
- HYDRAULIC SIGNAL LINE
- PNEUMATIC OR VACUUM SIGNAL LINE
- INTERLOCK
- DIAPHRAGM SEAL
- ROTAMETER
- SIGHT GLASS
- LOCAL MOUNTED INSTRUMENT
- FRONT OF PANEL MOUNTED INSTRUMENT
- FRONT OF PANEL MOUNTED INSTRUMENT AUXILLIARY LOCATION
- REAR OF PANEL MOUNTED INSTRUMENT
- REAR OF PANEL MOUNTED INSTRUMENT AUXILLIARY LOCATION
- DIGITAL LOGIC OPERATOR INTERFACE AUXILIARY LOCATION
- DIGITAL LOGIC OPERATOR INTERFACE
- SHARED CONTROL AUXILIARY LOCATION
- SHARED DISPLAY COMPUTER CONTROL AND OPERATOR INTERFACE
- AIR VENT FILTER
- MAGNETIC FLOW METER
- POSITIVE DISPLACEMENT FLOW METER
- VORTEX SHEDDING FLOW METER
- EQUIPMENT NUMBER
- INSTRUMENT/PLANT AIR SUPPLY

FY 102 A
- LETTERS OF IDENTIFICATION
- SPECIAL DESIGNATION
- INSTRUMENT TAG NUMBER

TYPICAL CALL OUT

ABBREVIATIONS

BTU	BRITISH THERMAL UNIT
CU FT	CUBIC FEET
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
KW	KILOWATT
LB/HR	POUNDS PER HOUR
SCFM	STD. CUBIC FT/MINUTE
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
FO	FAIL OPEN
FC	FAIL CLOSED
AO	AIR TO OPEN
AC	AIR TO CLOSE
IA	INSTRUMENT AIR
EF	EXHAUST FAN
GV	GRAVITY VENTILATOR
UH	UNIT HEATER
RED	REDUCER
ECC	ECCENTRIC
TBD	TO BE DETERMINED
TF	TOP FLAT
TYP	TYPICAL
MATL	MATERIAL
MED	MEDIUM
CO	CARBON MONOXIDE
RH	RELATIVE HUMIDITY
CFM	CUBIC FEET/MINUTE
IX	ION EXCHANGE
PMP	PUMP
DR	DRAIN
HC	HOSE COUPLING
SCR	STRAINER
TNK	TANK

TS TEMPORARY FLAT PLATE STRAINER

INSTRUMENTATION SPECIAL DESIGNATIONS

DESIGNATION	FUNCTION/ABBREVATION
Σ/N OR AVG	AVERAGING
± OR BI	BIAS
1:1,1:3,2:1 (TYP)	BOOST,GAIN OR ATTENUATE (INPUT:OUTPUT)
△ OR DIF	DIFFERENTIAL
÷ OR DIV	DIVIDE
√‾ OR SQ.RT.	EXTRACT SQUARE ROOT
X OR MUL	MULTIPLY
N	RAISE TO POWER
REV	REVERSING
Σ OR SUM	SUMMING
L	LOW
LL	LOW LOW
H	HIGH
HH	HIGH HIGH
HL	HIGH LOW
∫	INTEGRATE (TIME INTEGRAL)
%	PROPORTIONAL
Y	UNDETERMINED COMPUTING RELAY
HOA	HAND-OFF-AUTO
⊼	EXISTING INSTRUMENT TO BE RELOCATED
I/P	CURRENT TO PNEUMATIC TRANSDUCER
RUN	RUNNING
OA	OFF-AUTO
OCA	OPEN-CLOSE-AUTO
I/O	INPUT / OUTPUT
✳	EXISTING INSTRUMENT
UD	UP/DOWN
EW	EAST/WEST
I/I	CURRENT TO CURRENT

PIPING SPECIFICATIONS

FLOWING MEDIUM	MED CODE	MATL CODE
BACK WASH	BW	A, A6
BLOWER AIR	BA	A
CHILLED WATER	CHS, CHR	A
CHLORINE	CL	B1
CONDENSATE	LC	W
CONDENSER WATER	CWS, CWR	A
COOLING WATER	WS, WR	A
DRAIN	DR	A, T
THICKENER OVERFLOW	TO	T
FILTRATE EFFLUENT	FT	A
FLOCCULANT	FL	A
FLUSH WATER	FW	T
FORCE MAIN	FM	M
GROUNDWATER	GW	A, A6, B4, M
INSTRUMENT AIR	IA	T, A
MELTER OFF-GAS	OG	T
NITRIC ACID	AN	T1
PERCHED GND WATER	PGW	B
PHOSPHORIC ACID	PAPH	T1
PLANT AIR	PA	W
POLISHED WATER	PW	A
POTABLE WATER	DW	W, B, B3, C
PROCESS WATER	TW	A
PROCESS WASTEWATER	CE	A
RAW WATER	RW	A
RECYCLE WATER	RC	T, B2
RESIN	RE	A, A6
REGENERANT	RG	A6
SCRUBBER RECYCLE	RSL	T
SLURRY	SL	T
SODIUM CARBONATE	SC	A
SODIUM HYDROXIDE	NA	T
SODIUM SILICATE	SS	A
STORM WATER	ST	A
SULFURIC ACID	SB	T1
SUMP DISCHARGE	SU	T
VACUUM	V	A
VENTILATION AIR	VE	T
WASTE WATER	WW	T

EXAMPLE: CE-2"-A-100-ET
- MEDIUM CODE
- NOMINAL PIPE SIZE
- MATERIAL CODE
- LINE NUMBER
- HEAT TRACING AND INSULATION

A - A53.GR. A, SEAMLESS STEEL PIPE
A6 -PLASTIC LINED STEEL PIPE
B - PVC
B1 - PVDF
B2 - PVDF, 100 PSI
B3 - CPVC
B4 - HDPE
L - FIBERGLASS REINFORCED PLASTIC
M - DUCTILE IRON
T - 304L, STAINLESS STEEL PIPE
T1 - 316L, STAINLESS STEEL PIPE
W - A53.GR. A, GALVANIZED STEEL PIPE
ET - ELECTRIC TRACED AND INSULATED
IC - ANTI-CONDENSATION INSULATION
ST - STEAM TRACED AND INSULATED
P - PERSONNEL PROTECTION INSULATION

LETTERS OF INSTRUMENT IDENTIFICATION

LETTER	FIRST LETTER: MEASURED OR INITIATING VARIABLE	2ND LETTER: MODIFIER	3RD OR 4TH LETTER: READ OUT OR PASSIVE FUNCTION
A	ANALYSIS	ALARM	ALARM
B	BURNER FLAME	----	----
C	CAMERA	CONTROLLER	CONTROLLER
D	DENSITY	DIFFERENTIAL	----
E	VOLTAGE	ELEMENT	ELEMENT
F	FLOW RATE	RATIO (FRACTION)	----
G	GAGING (DIM)	VIEWING DEVICE	GLASS
H	HAND (MANUAL)	----	HIGH
I	CURRENT (ELECT)	INDICATE	INDICATE
J	POWER	SCAN	----
K	TIME	----	----
L	LEVEL	LIGHT	LOW
M	MOIST OR HUMIDITY	----	----
N	----	----	----
O	OBSERVATION	----	ORIFICE
P	PRESSURE OR VACUUM	----	POINT (TEST)
Q	QUANTITY OR EVENT	TOTALIZER	----
R	RADIOACTIVITY	RECORDER	----
S	SPEED OR FREQUENCY	SAFETY/SWITCH	SWITCH
T	TEMPERATURE	TRANSMITTER	TRANSMITTER
U	USER'S GUIDE	----	MULTIFUNCTION
V	VISCOSITY	----	VENT, VALVE
W	WEIGHT OR FORCE	WELL	----
X	UNCLASSIFIED	----	UNCLASSIFIED
Y	RELAY	RELAY	----
Z	POSITION	----	----

THE TERMS "HIGH" AND "LOW" WHEN APPLIED TO VALVES ARE DEFINED AS FOLLOWS:
"HIGH" = THE VALVE IS FULLY OPEN
"LOW" = THE VAVLE IS FULLY CLOSED.

NOTES

524

REF DWG NO.	DRAWING TITLE
95X-5900-X-00318	DRAWING INDEX

INFORMATION ONLY

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		N/A	9/3/96

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

DRAWING TITLE
MECHANICAL PROCESS
PIPING AND INSTRUMENTATION DIAGRAM
SYMBOLS AND LEGEND SHEET

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/03/95		9/30/96	S.G. / J.C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E 9/3/96 DATE	N/A DATE	54500

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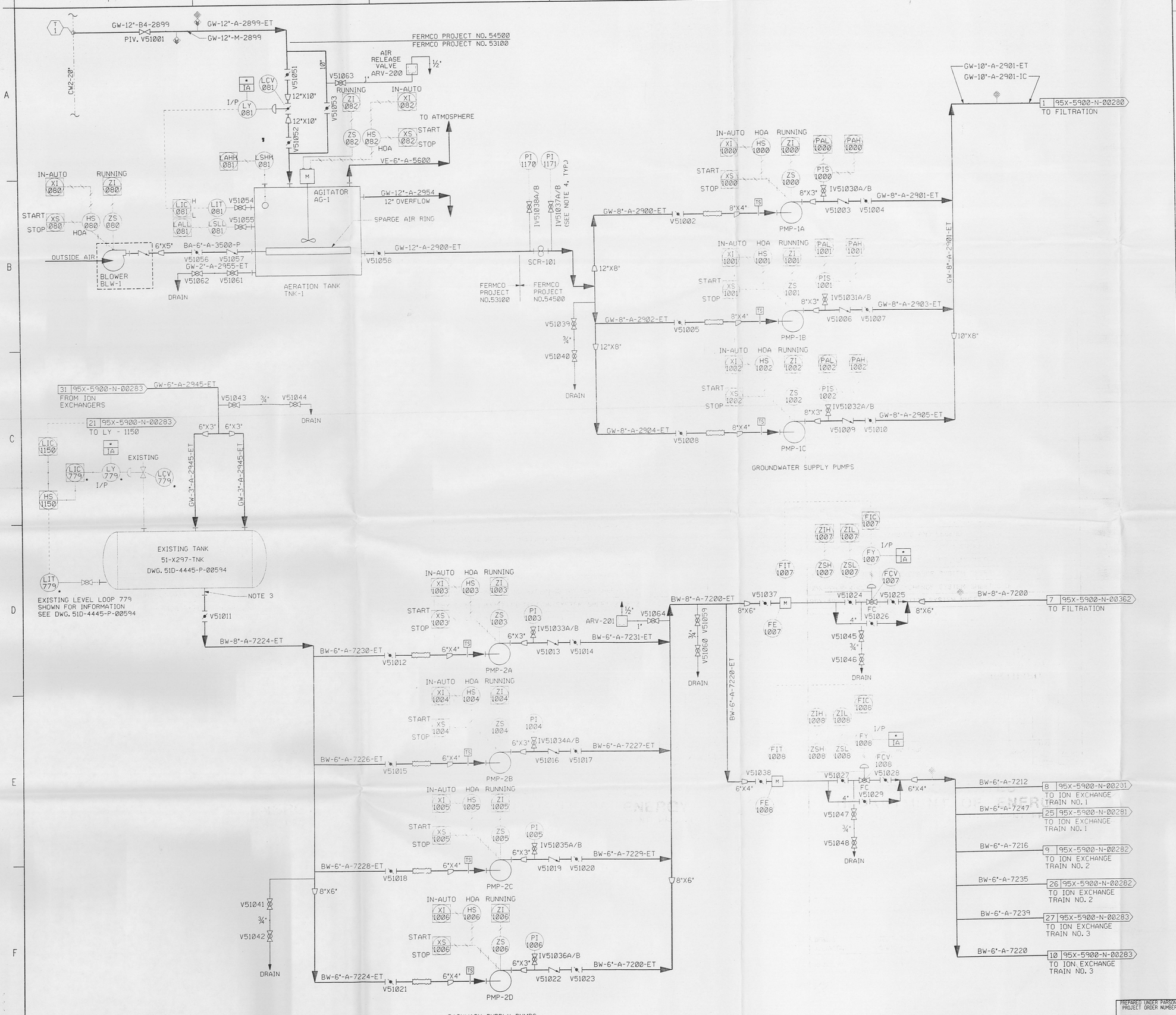
PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-N-00278	N0050	0



NOTES

1. ALL INSTRUMENTS WILL BE TIED TO THE AWWT FISCHER/PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS). MOTOR OPERATED EQUIPMENT WILL RECEIVE A RUN CONTACT FROM THE DCS AND HAVE A CONTACT FOR INDICATION OF RUNNING AT THE DCS.
2. PUMPS AND STRAINER SHALL BE HEAT TRACED AND INSULATED. NOZZLES, NIPPLES, AND VALVES ASSOCIATED WITH AERATION TANK'S LEVEL TRANSMITTER AND LOW LEVEL SWITCH SHALL BE HEAT TRACED AND INSULATED.
3. REMOVE EXISTING 8" X 6" REDUCER AND 6" FLANGE. RE-USED EXISTING 8" FLANGE ON TANK.
4. SEE PIPING ISOMETRIC DRAWINGS FOR ISOLATION AND TEST PORT VALVE DETAILS. VALVES A AND B RESPECTIVELY.

LAST VALVE NUMBER | V51064

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00280	FILTRATION SYSTEM SHEET 1 OF 2
95X-5900-N-00281	ION EXCHANGE SYSTEM SHEET 1 OF 3
95X-5900-N-00282	ION EXCHANGE SYSTEM SHEET 2 OF 3
95X-5900-N-00283	ION EXCHANGE SYSTEM SHEET 3 OF 3
95X-5900-N-00362	FILTRATION SYSTEM SHEET 2 OF 2
95X-5900-X-00318	DRAWING INDEX

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		N/A	

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

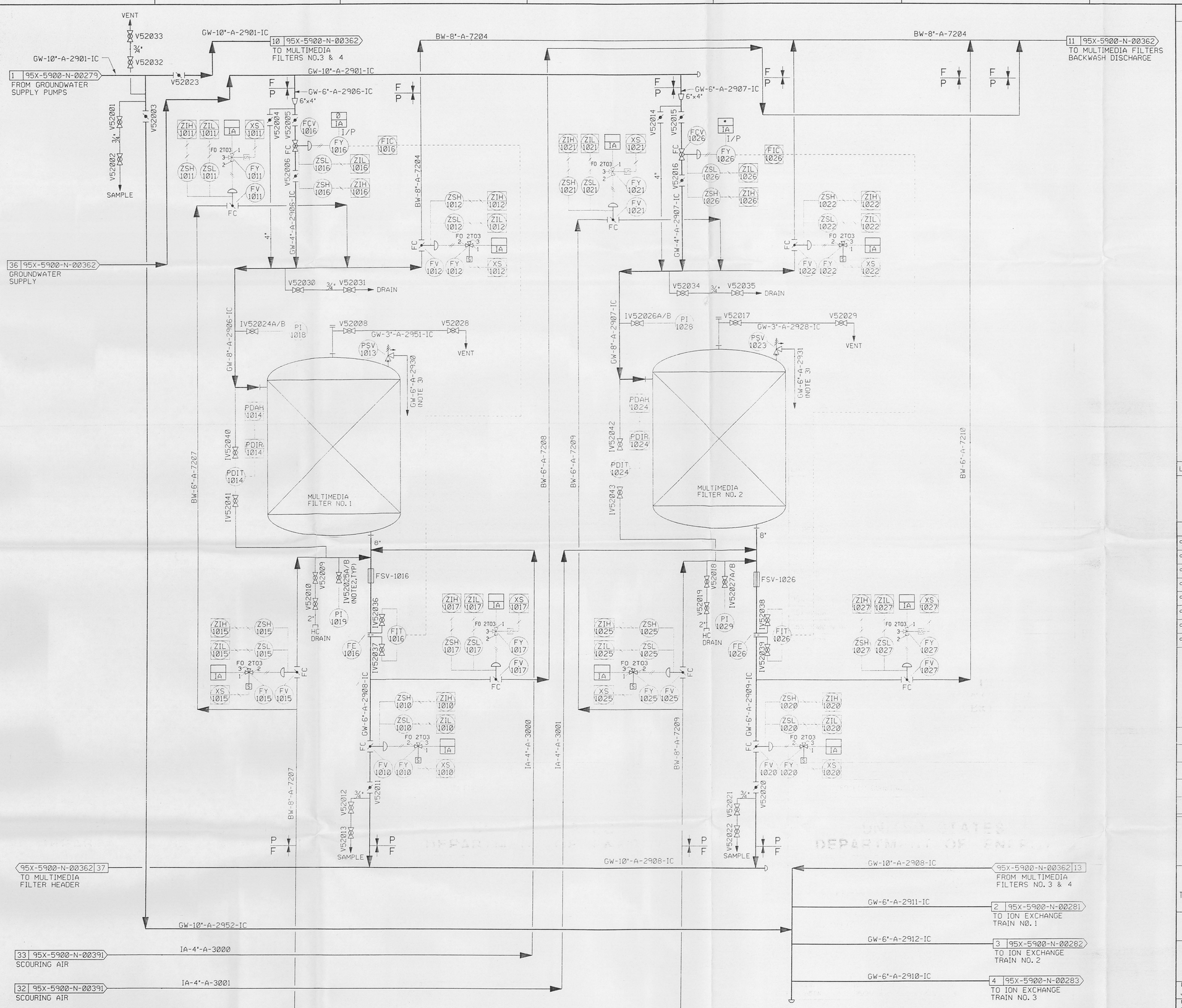
DRAWING TITLE
MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM GROUNDWATER SUPPLY

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/03/95		9/20/96	S.G. / J.C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL (A-E)	DATE	FERMCO CRU APPROVAL	DATE	FERMCO PROJECT NUMBER
	9/30/96	N/A		54500

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/PO126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-N-00279	N0051	0



NOTES

524

1. ALL INSTRUMENTS WILL BE CONTROLLED BY THE AWWT FISCHER/ PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS).
2. SEE PIPING ISOMETRIC DRAWINGS FOR ISOLATION AND TEST PORT VALVE DETAILS, VALVES A AND B RESPECTIVELY.
3. ESTIMATED LINE SIZE, RELIEF VALVES SHALL BE SIZED BY THE SUBCONTRACTOR.
4. EACH MULTIMEDIA FILTER IS MOUNTED ON A SEPARATE SKID.

LAST VALVE NUMBER: V52043

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00279	GROUNDWATER SUPPLY
95X-5900-N-00281	ION EXCHANGE SYSTEM SHEET 1 OF 3
95X-5900-N-00282	ION EXCHANGE SYSTEM SHEET 2 OF 3
95X-5900-N-00283	ION EXCHANGE SYSTEM SHEET 3 OF 3
95X-5900-N-00362	FILTRATION SYSTEM SHEET 2 OF 2
95X-5900-N-00391	AIR SCOURING SYSTEM
95X-5900-X-00318	DRAWING INDEX

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION	AHS	N/A	9/1/96

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

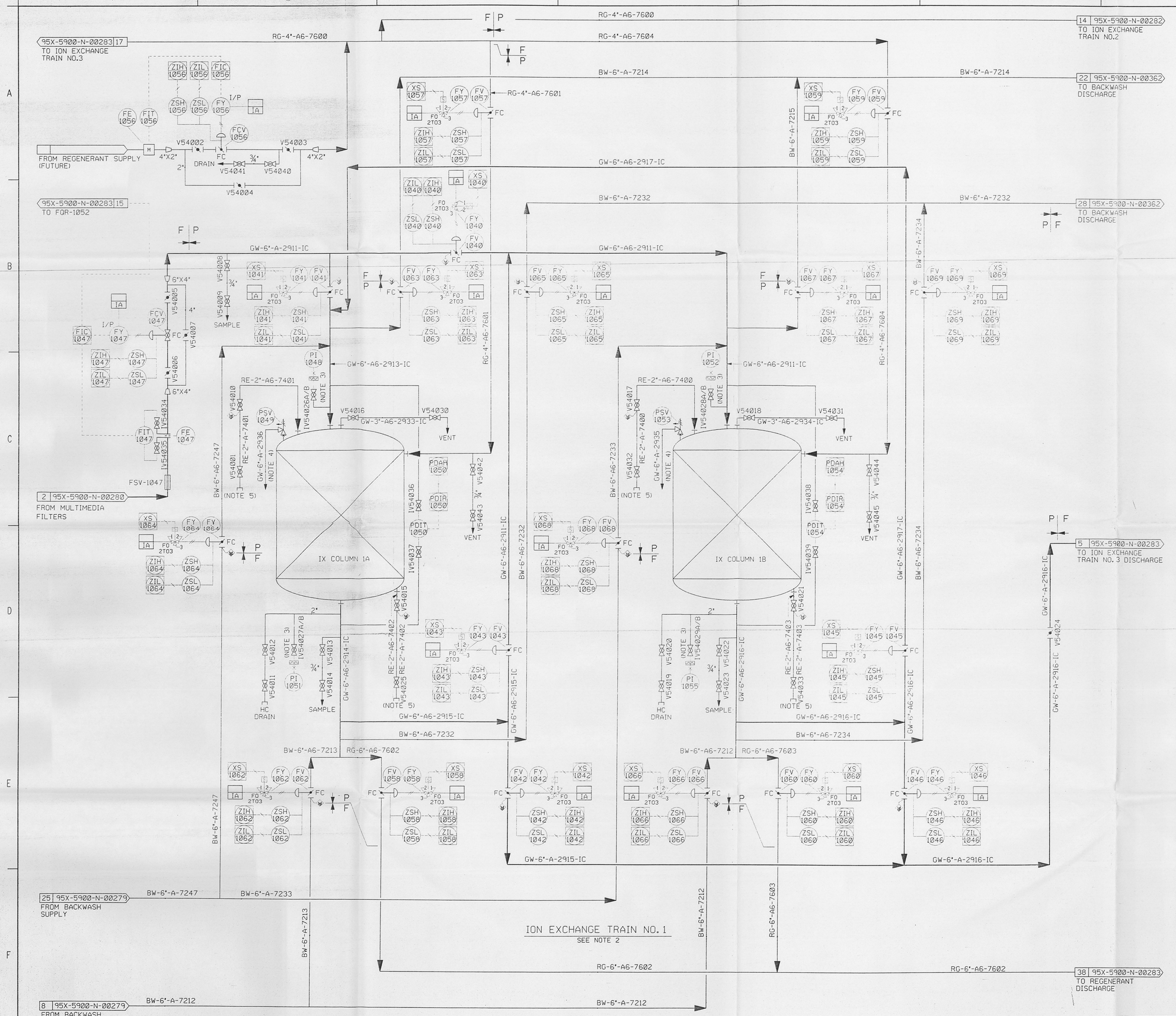
DRAWING TITLE
MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM
FILTRATION SYSTEM SHEET 1 OF 2

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/04/95	Sal Gh	9/30/96	S. G. / J. C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E DATE 9/1/96	N/A DATE	54500 12

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.1.5.3.1 00-90701	95X-5900-N-00280	N0052	0



NOTES

524

1. ALL INSTRUMENTS WILL BE CONTROLLED BY THE AWWT FISCHER/ PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS).
2. EACH IX COLUMN AND ASSOCIATED PIPING IS MOUNTED ON A SEPARATE SKID.
3. SEE DRAWING 95X-5900-P-00343 FOR ISOLATION AND TEST PORT VALVE DETAILS. VALVES A AND B RESPECTIVELY.
4. ESTIMATED LINE SIZE, RELIEF VALVES SHALL BE SIZED BY THE SUBCONTRACTOR.
5. QUICK HOSE COUPLING MALE ADAPTER FOR PORTABLE RESIN HANDLING UNIT.

LAST VALVE NUMBER | V54045

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00279	GROUNDWATER SUPPLY
95X-5900-N-00280	FILTRATION SYSTEM SHEET 1 OF 2
95X-5900-N-00282	ION EXCHANGE SYSTEM SHEET 2 OF 3
95X-5900-N-00283	ION EXCHANGE SYSTEM SHEET 3 OF 3
95X-5900-N-00362	FILTRATION SYSTEM SHEET 2 OF 2
95X-5900-X-00318	DRAWING INDEX

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION	MWB	N/A	9/13/96

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

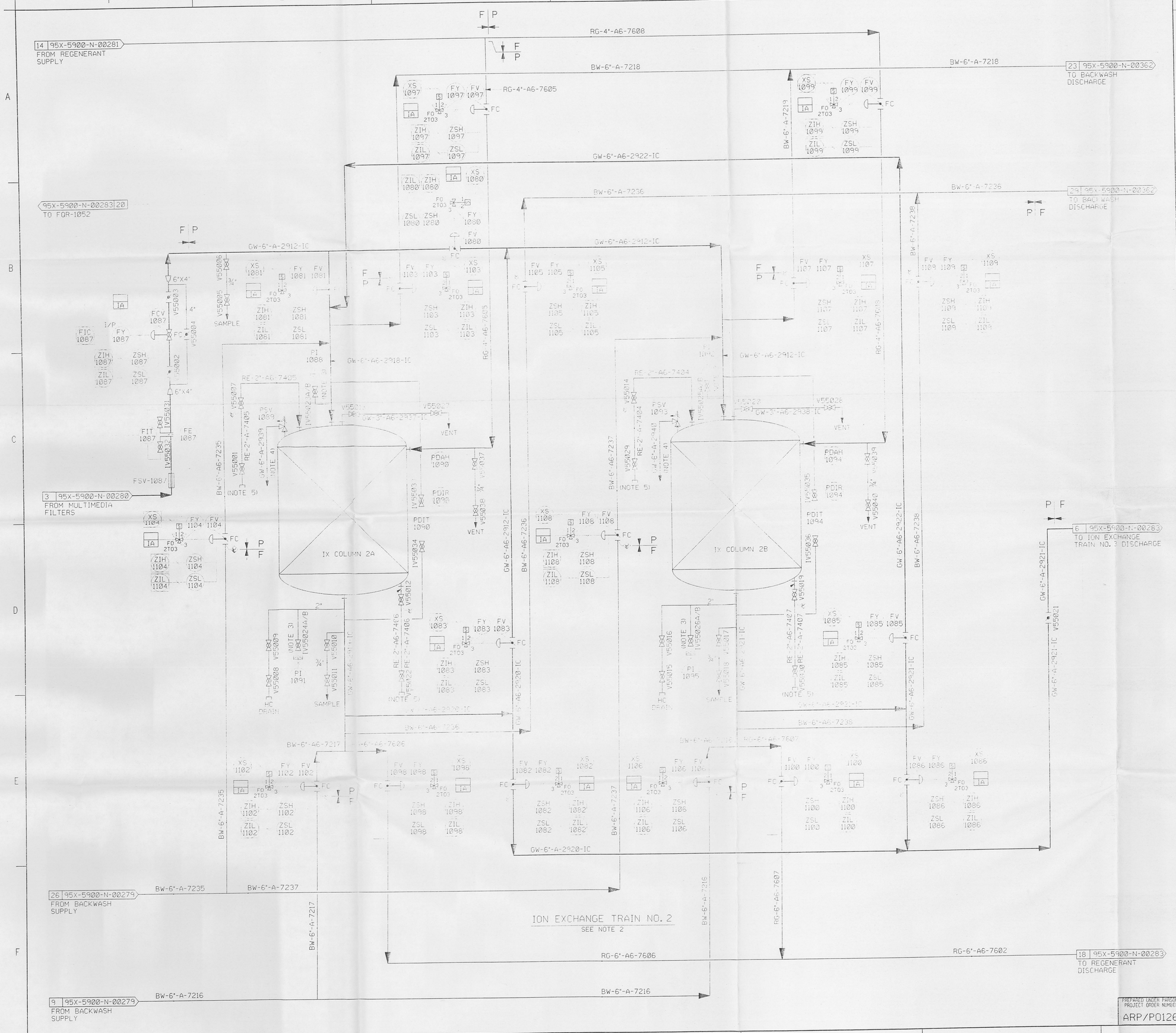
DRAWING TITLE
MECHANICAL PROCESS
PIPING AND INSTRUMENTATION DIAGRAM
ION EXCHANGE SYSTEM SHEET 1 OF 3

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/04/95	Sal Gilio	9/30/96	S. G. / J. C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E DATE	DATE	54500 13

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	TEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.1.5.3.1 00-90701	95X-5900-N-00281	N0054	0



NOTES

1. ALL INSTRUMENTS WILL BE CONTROLLED BY THE AWWT FISCHER/PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS).
2. EACH IX COLUMN AND ASSOCIATED PIPING IS MOUNTED ON A SEPARATE SKID.
3. SEE DRAWING 95X-5900-P-00343 FOR ISOLATION AND TEST PORT VALVE DETAILS. VALVES A AND B RESPECTIVELY.
4. ESTIMATED LINE SIZE, RELIEF VALVES SHALL BE SIZED BY THE SUBCONTRACTOR.
5. QUICK HOSE COUPLING MALE ADAPTER FOR PORTABLE RESIN HANDLING UNIT.

LAST VALVE NUMBER | V55040

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00279	GROUNDWATER SUPPLY
95X-5900-N-00280	FILTRATION SYSTEM SHEET 1 OF 2
95X-5900-N-00281	ION EXCHANGE SYSTEM SHEET 1 OF 3
95X-5900-N-00283	ION EXCHANGE SYSTEM SHEET 3 OF 3
95X-5900-N-00362	FILTRATION SYSTEM SHEET 2 OF 2
95X-5900-X-00318	DRAWING INDEX

EDC CONTROLLED CERTIFIED

REV	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		N/A	

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

DRAWING TITLE
MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM
ION EXCHANGE SYSTEM SHEET 2 OF 3

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/04/95		9/30/96	S.G. / J.C.	01/09/96

PLANT/BLDG. NO	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E DATE 9/13/96	N/A DATE	54500

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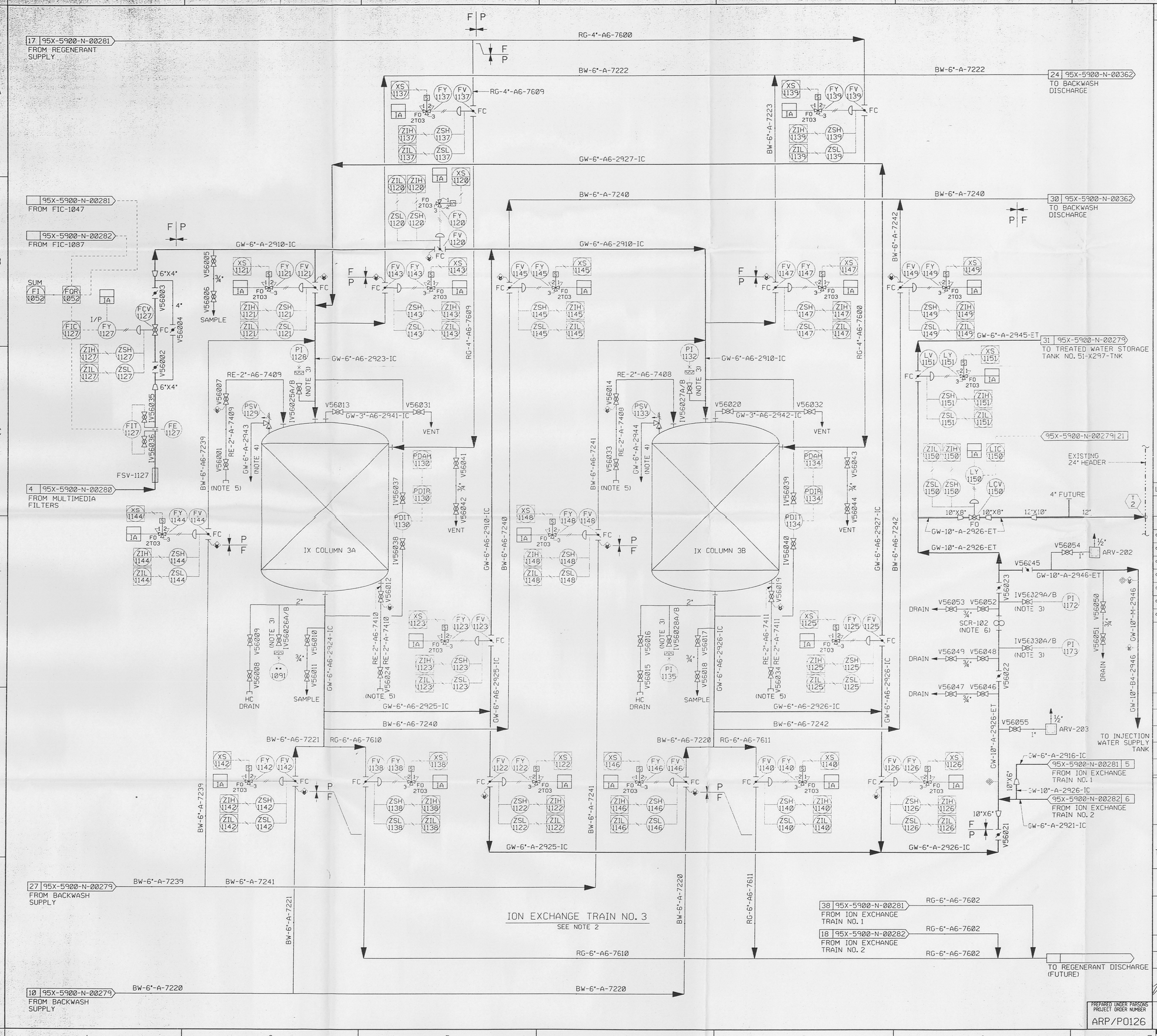
PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	TEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/PO126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-N-00282	N0055	0



NOTES

1. ALL INSTRUMENTS WILL BE CONTROLLED BY THE AWWT FISCHER/PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS).
2. EACH IX COLUMN AND ASSOCIATED PIPING IS MOUNTED ON A SEPARATE SKID.
3. SEE DRAWING 95X-5900-P-00343 FOR ISOLATION AND TEST PORT VALVE DETAILS. VALVES A AND B RESPECTIVELY.
4. ESTIMATED LINE SIZE, RELIEF VALVES SHALL BE SIZED BY THE SUBCONTRACTOR.
5. QUICK HOSE COUPLING MALE ADAPTER FOR PORTABLE RESIN HANDLING UNIT.
6. STRAINER SHALL BE HEAT TRACED AND INSULATED.

LAST VALVE NUMBER | V56055

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00279	GROUNDWATER SUPPLY
95X-5900-N-00280	FILTRATION SYSTEM SHEET 1 OF 2
95X-5900-N-00281	ION EXCHANGE SYSTEM SHEET 1 OF 3
95X-5900-N-00282	ION EXCHANGE SYSTEM SHEET 2 OF 3
95X-5900-N-00362	FILTRATION SYSTEM SHEET 2 OF 2
95X-5900-X-00318	DRAWING INDEX

INFORMATION ONLY

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION	MLLE	N/A	7/31/96

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

DRAWING TITLE
MECHANICAL PROCESS PIPING AND INSTRUMENTATION DIAGRAM
ION EXCHANGE SYSTEM SHEET 3 OF 3

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
J. LAWSON	05/04/95		9/30/96	S. G. / J. C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E DATE 9/30/96	N/A DATE	54500

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-N-00283	N0056	0

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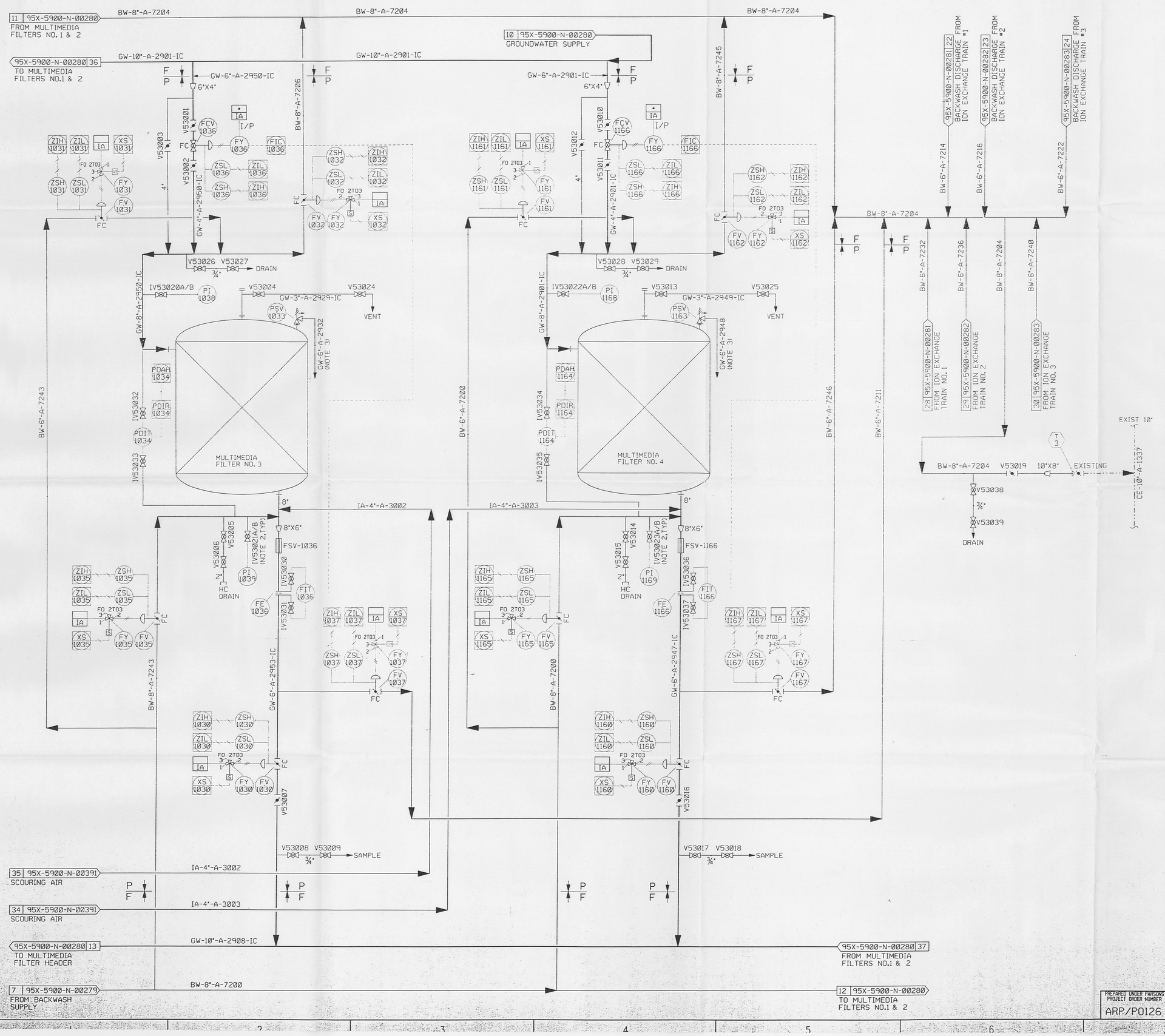

NOTES

524

1. ALL INSTRUMENTS WILL BE CONTROLLED BY THE AWWT FISCHER/ PORTER DISTRIBUTED CONTROL SYSTEM (AWWT DCS).
2. SEE PIPING ISOMETRIC DRAWINGS FOR ISOLATION AND TEST PORT VALVE DETAILS, VALVES A AND B RESPECTIVELY.
3. ESTIMATED LINE SIZE, RELIEF VALVES SHALL BE SIZED BY THE SUBCONTRACTOR.
4. EACH MULTIMEDIA FILTER IS MOUNTED ON A SEPARATE SKID.

LAST VALVE NUMBER	V53039

REF DWG NO.	DRAWING TITLE
95X-5900-N-00278	SYMBOLS AND LEGEND
95X-5900-N-00280	FILTRATION SYSTEM SHEET 1 OF 2
95X-5900-N-00281	ION EXCHANGE SYSTEM SHEET 1 OF 3
95X-5900-N-00282	ION EXCHANGE SYSTEM SHEET 2 OF 3
95X-5900-N-00283	ION EXCHANGE SYSTEM SHEET 3 OF 3
95X-5900-N-00391	AIR SCOURING SYSTEM
95X-5900-X-00318	DRAWING INDEX

INFORMATION ONLY

EDC CONTROLLED CERTIFIED

REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	FERMCO	DATE
0	CERTIFIED FOR CONSTRUCTION		N/A	7/31/97

INITIALS AND DATE

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

THIS DRAWING PREPARED BY
PARSONS
THE RALPH M. PARSONS CO. - PARSONS MAIN, INC. - ENGINEERING-SCIENCE, INC.
CINCINNATI, OHIO

PROJECT NAME
ADVANCED WASTEWATER TREATMENT EXPANSION PROJECT

DRAWING TITLE
MECHANICAL PROCESS
PIPING AND INSTRUMENTATION DIAGRAM
FILTRATION SYSTEM SHEET 2 OF 2

DRAWN BY	DATE	LEAD ENGINEER	DATE	CHECKED BY	DATE
P. A. WILSON	10/03/95		9/30/96	S. G. /J. C.	01/09/96

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
BLDG. 51		NONE	

SUBMITTED FOR APPROVAL	FERMCO CRU APPROVAL	FERMCO PROJECT NUMBER
A-E DATE 7/31/97	DATE	54500 16

PREPARED UNDER PARSONS PROJECT ORDER NUMBER	DOE PROJECT NO.	FEMP PROJECT NO.	DRAWING INDEX CODE NO.	SHEET NO.	REV. NO.
ARP/P0126		WBS 1.1.1.1.5.3.1 00-90701	95X-5900-N-00362	N0053	0