Preliminary Analysis of the Wolverine World Wide Draft Tannery Interceptor System Response Activity Plan

Richard R. Rediske, Ph.D.

The Tannery Interceptor System and Consent Decree

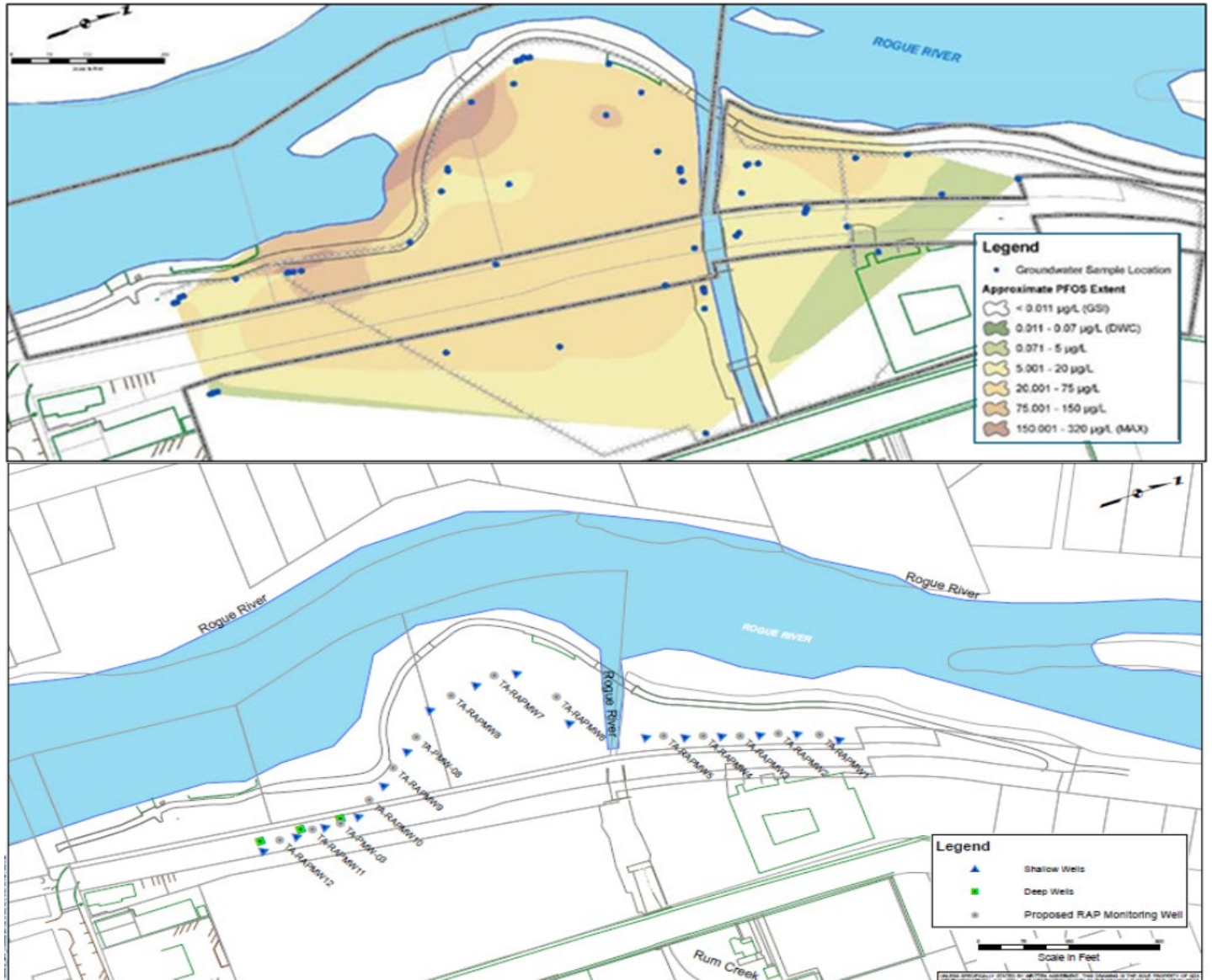
The system expansion shall be appropriately sized to address and control PFAS Compounds contamination in groundwater at the Tannery before it enters the Rogue River. The Response Activity Plan shall contain a schedule for any interceptor system modifications or expansion(s) and **an appropriate groundwater monitoring plan to demonstrate the effectiveness of the interceptor system.**

No later than two (2) years after the interceptor system installation (including any needed modifications or expansions as approved in Paragraph 7.7(b)(i)), **Defendant shall demonstrate that the interceptor system is effective at addressing PFAS Compounds contamination and preventing PFAS Compounds from entering the surface water above water quality standards issued under Part 31 or shall propose to MDEQ for its review and approval, further modifications to the system to prevent PFAS Compounds from entering the surface water above water quality standards issued under Part 31.**

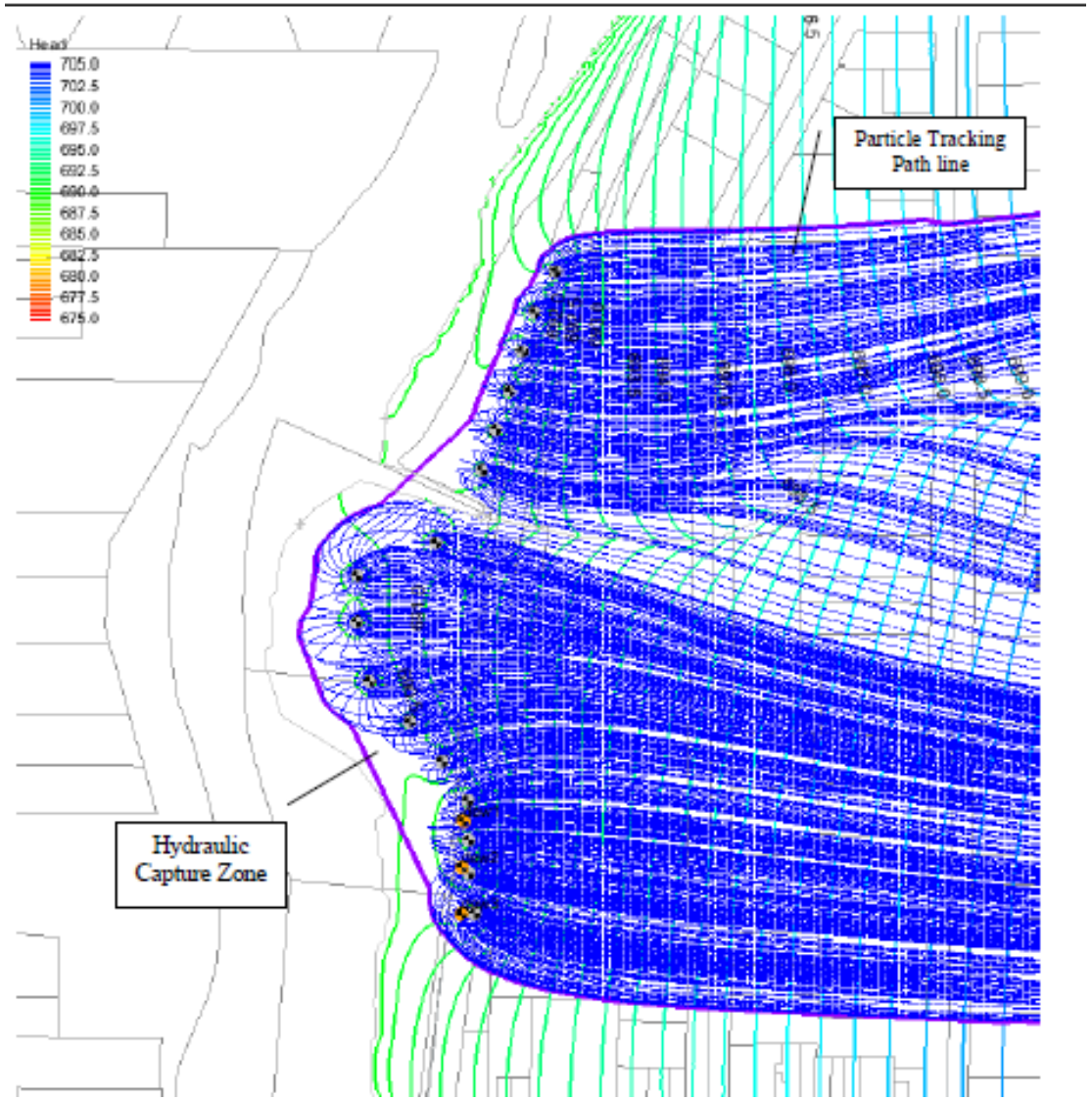
The Tannery Interceptor System Groundwater Monitoring Plan

Following installation of the system, R&W/GZA will implement a program to monitor the effectiveness of the system at capturing the groundwater plume. Twelve piezometers will be installed and two existing groundwater monitoring wells will also be utilized (Sheet No. 7). These 14 piezometers/monitoring wells are located mid-way between the extraction wells, where the drawdowns are expected to be the smallest. Two staff gauges, north and south of Rum Creek, will be installed in the Rogue River. Water level measurements from the two staff gauges in the Rogue River and 14 piezometers/monitoring wells will be measured weekly and compared to evaluate the system performance. An inward hydraulic gradient, which would indicate successful groundwater capture, is considered to be achieved when the groundwater elevations in the piezometers/monitoring wells are lower than that of the nearby staff gauge. Additionally, transducers will be installed in each extraction well for operation and maintenance purposes. Groundwater elevation and flow rate data from the individual extraction wells will also be reviewed to evaluate well performance. If performance monitoring indicates that the system or any individual well is either drawing too much water from the river or conversely not capturing groundwater as it reaches the well network, diagnosis will be performed and system maintenance work or modifications will be carried out as appropriate. **The monitoring program will not include groundwater sampling.**

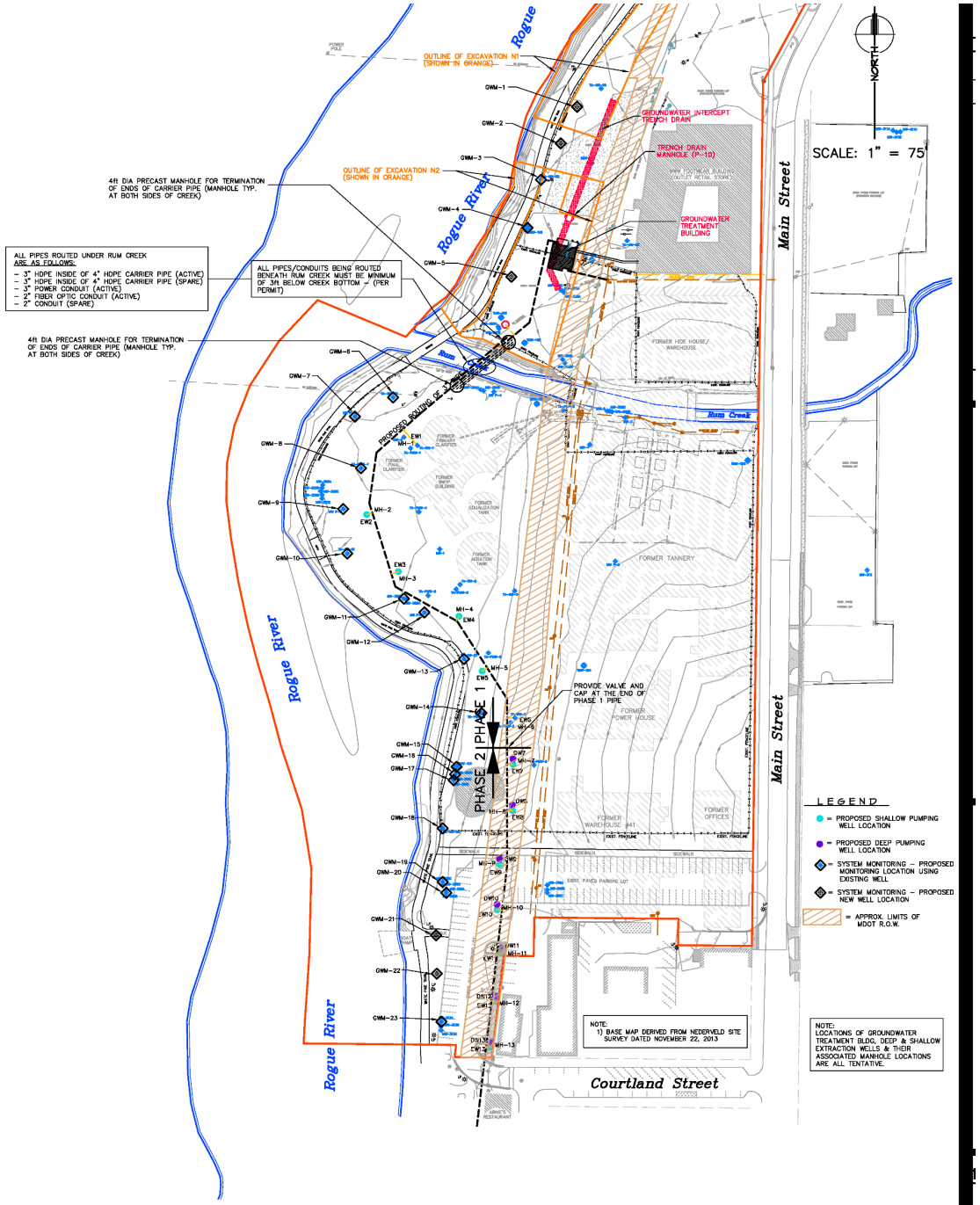
Groundwater Contamination at the Tannery and Proposed Extraction Well System



Modeled Tannery Extraction Well System Coverage

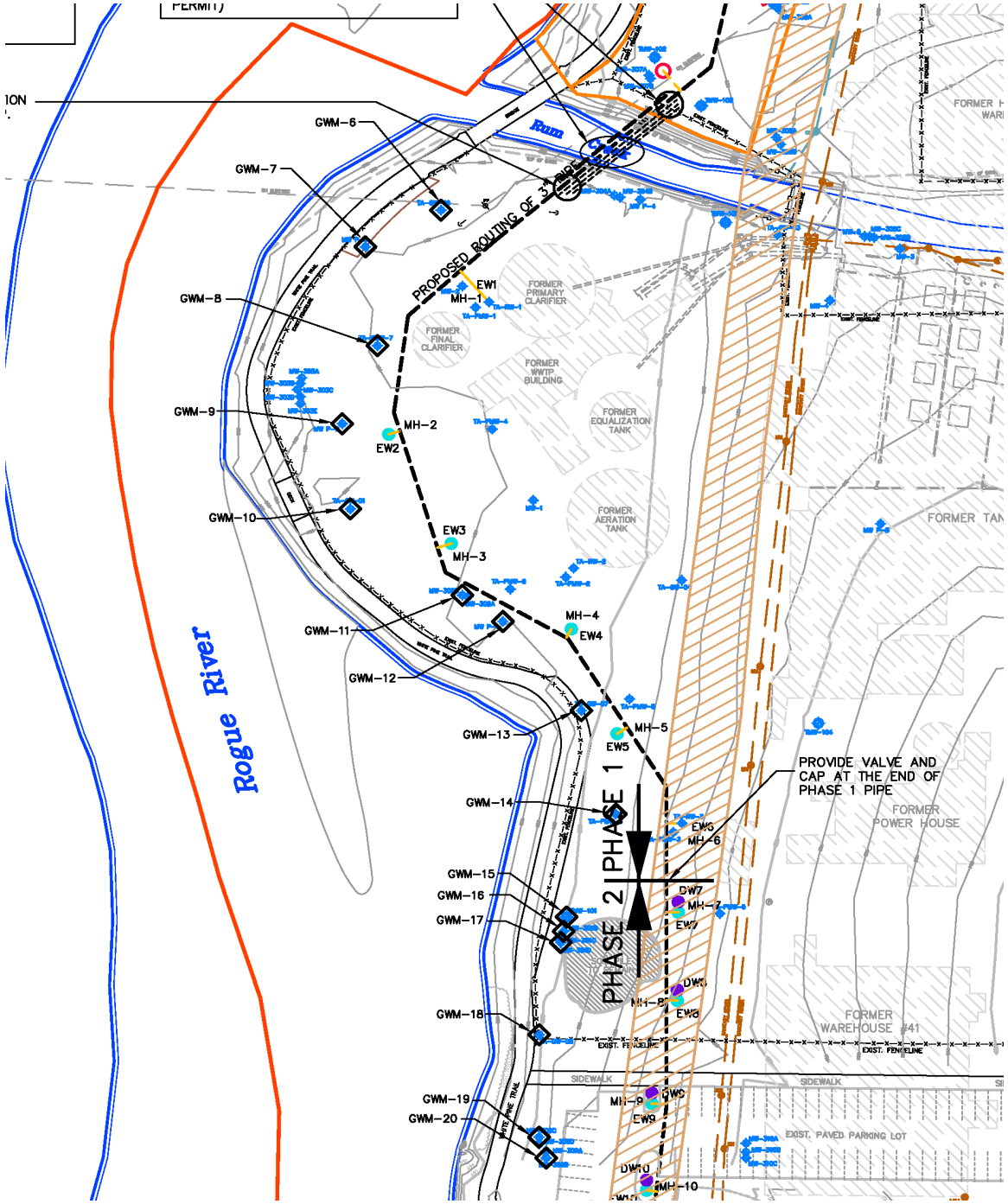


Groundwater Treatment System

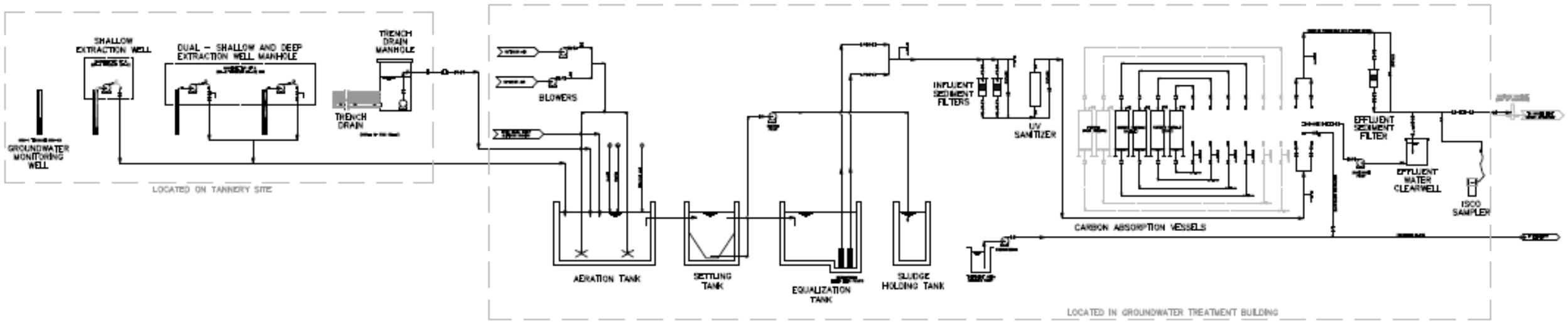


SITE PLAN W/ PROPOSED GROUNDWATER INTERIM REMEDY

Groundwater Treatment System



Groundwater Treatment System



GROUNDWATER INTERIM REMEDY - PROCESS FLOW DIAGRAM

Groundwater Treatment System

Influent Flow-	gpm	gpd
Phase I - NKSA discharge	7	10080
Phase II - NPDES discharge (includes Phase I)	28	40320
Phase III (Phase I & II + Unknown future)	50	72000

Extraction Wells	gpm	gpd
Phase I (5-6) MH-1 to MH-6 + North Trench Drain	7	10080
Phase II (~ 18 additional extaction wells)	21	30240
Subtotal	28	40320

Influent Concentrations		
PFAS - GW	28740	ppt
Fe - GW	1.27	mg/l
Ammonia - GW	1.18	mg/l
Chloride	133	mg/l

Effluent Required for NKSA discharge	
PFAS	ND

Groundwater Treatment System

GAC Vessels

	Phase I NKSA	Phase II NPDES
Concentration ppt	28740	28740
Lead size CF	24	38
Peak flow (gpm)	10	28
Avg Flow (gpm)	7	28
# columns in lead	1	1
Column height (in)	72	72
Column dia (in)	30	48
Column Area (SF)	4.9	12.6
HLR Average	1.4	2.2
HLR Peak	2.0	2.2
EBCT min	18	10
tb (time to breakthrough, days)	88	35