February 5, 2021

Mr. Stanley Radon, CPG
New York State Dept. of Environmental Conservation
Division of Solid and Hazardous Materials, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

Re: Summary Report
Supplemental Work Plan for Operable Unit No. 4 (OU-4)
Tecumseh Redevelopment Site #915009 – Lackawanna, NY

Dear Mr. Radon:

On behalf of Tecumseh Redevelopment, Inc., TurnKey Environmental Restoration, LLC (TurnKey) in association with Benchmark Civil/ Environmental Engineering & Geology, PLLC (Benchmark) has prepared this Summary Report to document the results of the Supplemental Work Plan to investigate groundwater conditions and to evaluate possible modifications to the OU-4 groundwater collection and/or treatment systems at the former Coke Plant By-Products Sub-Area of the Lackawanna, New York site. Additional background and details related to the Work Plan scope are presented below.

BACKGROUND

Tecumseh and the New York State Department of Environmental Conservation (NYSDEC) executed an Order on Consent (File No. 16-55) on September 19, 2017 to implement the final groundwater remedy for OU-4 consistent with the March 31, 2017 Statement of Basis issued by the NYSDEC as well as the August 2016 Benchmark/TurnKey Engineering Report entitled "Evaluation of Groundwater Corrective Measures- Operable Unit 4". The final groundwater OU-4 remedy consists of two independent groundwater collection, conveyance and treatment systems. The south system consists of 25 groundwater collection wells and treatment units including an oil/water separator, bag filtration, chemical feed, low-profile air stripper, flow meter with totalizer and PLC monitoring and control system with a 60 gpm design flow capacity. The north system consists of 27 groundwater collection wells and treatment units including bag filtration, chemical feed, low-profile air stripper, granular activated carbon filtration, flow meter with totalizer and PLC monitoring and control system

with a 40-gpm design flow capacity. The treatment units are housed in a single new building. The combined treated effluent flows to an infiltration gallery to recharge groundwater.

The construction of OU-4 groundwater remediation facilities was substantially completed and began operation on March 13, 2019. As required in the (April 2020) Operation, Maintenance and Monitoring (OM&M) Plan, the *2020 Annual Summary Report for OU-4 and Benzol Yard Area Source Control ICM* was initially submitted to NYSDEC on June 8, 2020 documenting remedial systems performance during the first year of operation. There were several rounds of comments and revisions culminating the Revised 2020 Annual Report (October 2020) that was approved by the NYSDEC on November 2, 2020. The NYSDEC final approval letter called for a *Supplemental Work Plan* which submitted to the Department on November 4, 2020 and approved by the Department on November 5, 2020 to perform the following tasks to address the above-stated issues and objectives:

SCOPE

Task 1- Investigate groundwater conditions and evaluate potential collection system modifications in the vicinity of OU4PZ-6 and RWS-8.

a. Investigate potential contributing sources of groundwater recharge (i.e. water line leaks, stormwater pipes, building basements) by: reviewing historic infrastructure plans in the vicinity of OU4PZ-6 and RWS-8; inspecting accessible surface structures, pits, sewers and measure water elevations; performing tests to confirm hydraulic connectivity. Evaluate pumping out and/or backfilling reservoirs, pits, basements causing these issues and estimate volumes.

b. Model hydraulic capture of additional groundwater collection wells in vicinity of RWS-8 and OU4PZ-6 based on findings of the groundwater investigation in the vicinity of OU4PZ-6 and RWS-8. Evaluate what associated electrical, piping, controls, and appurtenances may be required for modifications to the collection system.

c. Recommend corrective measures to address potential contributing sources of groundwater recharge in the vicinity of OU4PZ-6 and RWS-8 if identified and if considered to be potentially cost-effective. Recommend collection system modifications if deemed necessary near RWS-8 and/or OU4PZ-6 to prevent off-site contaminant migration.

Task 2- Evaluate potential modifications to the South Treatment System to improve removal of PFOA/PFAS, naphthalene, and phenolic compounds.

The granular activated carbon (GAC) filtration units in northern treatment system have already clearly demonstrated the ability to effectively remove the above-referenced compounds. Replumbing the south treatment system effluent from the air stripper to the influent side of the existing north treatment system GAC units is the least cost method to accomplish this task, provided the existed GAC units can effectively handle the higher flow and contaminant mass loads. This alternative will be evaluated by performing treatment process calculations to predict GAC performance and GAC utilization at new increased flow rate (north and south combined flow). If this alternative is determined not to be feasible or advisable, then additional GAC units will be evaluated. A revised P&ID treatment system diagram with proposed piping, additional GAC filters (if deemed necessary), and control modifications will be prepared.

Task 3- Summary Report.

Prepare a summary report including: investigation findings; recommendations for modifications and/or additional collection, controls, and/or treatment; pre-design cost estimates, and; proposed implementation schedule.

TASK 1 RESULTS- INVESTIGATION OF GROUNDWATER CONDITIONS AND EVALUATION OF POTENTIAL COLLECTION SYSTEM MODIFICATIONS

A. INVESTIGATE POTENTIAL CONTRIBUTING SOURCES OF GROUNDWATER RECHARGE AND RECOMMEND MEASURES

During the investigation of historical infrastructure in the vicinity of the of the groundwater mound near OU4PZ-6 we found that there were many historic features that could convey or redirect water. There were many sub-surface pipes, at least one sub-grade trench, and a few pits in this area. There are too many sources that could convey or redirect water to thoroughly investigate. However, we did discover that OU4PZ-6 was installed in the backfill of former Tar Decanter Sludge Pit (SWMU P-9) that was remediated as part of OU-2 (see photo inset). There is likely limited groundwater communication through this underground structure which contributes to the groundwater elevation in OU4PZ-6 to remain higher than the surrounding area at times. This also suggests that the

groundwater quality in OU4PZ-6 is not representative of the surrounding groundwater quality.

We surveyed all visible water elevations in ditches, sewers, pits, and basements in the area to look for elevated water levels that might also contribute to mounding in this area. Based on that survey, the former lime settling basin located just east of OU4PZ-6 is a likely source of groundwater mounding. The settling basin water elevation was 0.3 feet higher than the groundwater elevation at OU4PZ-6 on November 7, 2020. The settling basin and the underground structure that was SWMU P9 may have been connected when the site was operational.

The water level in the settling basin is above the outlet, indicating the outlet is plugged. We propose to pump out several thousand gallons from the settling basin water to the ground surface between RWN-17 and RWN-19 on the interior of the northern collection system. That will allow the discharged water to eventually and slowly be collected and treated without effecting groundwater gradients and flows near the perimeter of the collection system. Depending on the discharged water quantity and the resulting water elevation in the settling basin, a recommendation will be made as to whether to continue pumping and other potential actions such as backfilling the basin may be advisable.

Recovery well RWN-20 is the groundwater pumping well closest to OU4PZ-6. We investigated RWN-20 operating information and found that it runs less than almost all other

recovery wells in OU-4. We lowered the pump set points and found it made little to no difference in the rate of collection. We concluded that the only reasonable way to improve groundwater collection in the vicinity of OU4PZ-6, if needed, would be to install an additional collection well or two.

During the investigation of historical infrastructure in the vicinity of RWS-8, we did not find any historic features that may explain the lack of apparent groundwater drawdown there. During the installation of this well, it was noted that they were drilling through concrete from 3 to 15 feet below grade. When the drill broke through the concrete, water filled the augers quickly to 6 feet below grade. From 15 to 19 feet below grade the drill was advanced easily. At the end of that day (July 10, 2018) the water level was at 4 feet below grade or approximately 579 feet elevation. On October 1, 2018, the static groundwater elevation was at 575.75 feet at RWS-8 (system had not been turned on). Since then, the groundwater elevation at RWS-8 has been fluctuating between 575.1 and 576.7 feet. We have verified that RWS-8 is pumping at an equivalent rate to all other recovery wells without seeing the same water level drawdown. We believe that RWS-8 may be located within a subsurface concrete structure and/or that there are nearby groundwater recharge from flooded sewer pipes and/or subsurface structures. We concluded that the only reasonable way to improve groundwater collection in the vicinity of RWS-8 would be to install an additional collection well or two.

B. EVALUATE ADDITIONAL GROUNDWATER COLLECTION WELLS

The purpose of the groundwater pumping is to collect and hydraulically contain throughout contaminated groundwater from the southern, eastern, central and northern portions of OU-4, to remove contaminant mass from the subsurface and potential off-site migration, particularly to adjacent waterways. As the Gateway Metroport Canal is directly connected to Lake Erie and is very close to the eastern side of OU-4, the efficacy of groundwater collection and control along the eastern perimeter of OU-4 is particularly important. The most recent and comprehensive groundwater isopotentials in and around the OU-4 Area are provided on Figure 1 based on groundwater level measurements made in July 2020. Figure 1 illustrates the extent of hydraulic containment achieved from the OU-4 collection system which appears fairly comprehensive, with the exceptions in the vicinity of RWS-8 along the southeast perimeter which shows very little capture around that collection well and in the vicinity of

piezometer OU4PZ-6 along the northern perimeter of the OU-4 Area. Figure 2 illustrates both baseline (2018 groundwater quality prior to implementation of OU-4) and post-implementation of groundwater corrective measures in the OU-4 Area. Examination of Figure 2 indicates that overall groundwater quality, particularly along the perimeter of OU-4 is improving with the notable exception in monitoring well MWN-54A located near the southeastern corner of OU-4. Each of the areas of concern near OU4PZ-6, RWS-8, and MWN-54A are discussed individually below.

Southeastern Perimeter

One recovery well, RWS-8, situated between recovery wells RWS-11 and RWS-9 along the southeastern perimeter of OU-4 has been unable to lower the groundwater elevation significantly resulting in a gap in the groundwater drawdown at that vicinity (see Figure 1). The cause for the inability of recovery well RWS-8 to lower the water table is attributed to the presence of an underground structure (such as a building basement) and/or recharge from leaking underground industrial water or sewer lines. Figure 2 shows that the baseline (i.e., before start-up of the collection and treatment system) BTEX concentrations is higher at well RWS-8, as compared to adjacent recovery wells RWS-11 and RWS-9. Downgradient (i.e., toward the Canal) groundwater quality at this location, as represented by wells MWN-53A and MWN-09, does not show significant impacts or increasing trends. Nevertheless, some additional collection in the vicinity of RWS-8 is proposed.

The second location along the southeastern perimeter where hydraulic control may need to be improved is in the vicinity of monitoring well MWN-54A. Specifically and as shown on Figure 1, the concentration of BTEX at this well has increased from 43,200 ug/L to 99,240 ug/L between 2018 and 2020 even though that well appears to be downgradient of and within the influence of recovery wells RWS-4 and RWS-7. We believe the groundwater plume that escaped the Benzol Yard (SWMU P-11) ICM collection system may have "wrapped around" recovery wells RWS-4 and RWS-7 from the north or south and may be migrating back toward those recovery wells from the south and/or east. Due to the significant and increasing contaminant levels in monitoring well MWN-54A, we propose addition recovery wells be installed in this location.

Northern Perimeter

The potential issue along the northern perimeter is whether groundwater contamination exists north of the collection system beyond its reach that may migrate off-site. The only monitoring point in that location is piezometer OU4PZ-6 where recent sampling data shows concentrations of BTEX at 76.7 ug/L (see Figure 2). However, as stated earlier, this data is not considered representative of groundwater on this area due to the location of piezometer OU4PZ-6 within the foundation of the remediated Tar Decanter Sludge Pit (SWMU P-9). Therefore we recommend additional investigation and characterization of groundwater in this vicinity.

C. RECOMMENDED COLLECTION SYSTEM MODIFICATIONS

Groundwater collection in the vicinity of recovery well RWS-8 and MWN-54A are proposed to be enhanced by the addition of recovery wells installed in the slag/fill unit. Two additional recovery wells are proposed to be installed approximately 50 feet north and south from recovery well RWS-8 (i.e., new wells RWS-8A and RWS-8B). Three additional recovery wells are proposed to be installed around monitoring well MWN-54-A (new wells RWS-6A, RWS-6B, and RWS-7A) as illustrated in Figure 2.

Two additional monitoring wells (MWN-95 and MWN-96) are proposed to be installed along the northern perimeter of OU-4 in the vicinity of OU4PZ-6 as shown in Figure 2. These will be used to collect and characterize the existing groundwater quality for the COCs (BTEX, naphthalene, phenolics). These new monitoring wells will be constructed like recovery wells but will not be fitted with pumps and controls nor connected to the existing groundwater collection system unless and until the sampling and analytical data indicates the presence of significant contamination.

The drawdown at each new recovery well was predicted based upon nearby recovery well drawdown data pumping at an average flow rate of nominally 1 gpm in the southern area (RWS-6A, RWS-6B, RWS-7A, RWS-8A and RWS-8B) and 0.5 gpm for the northern area (MWN-95 and MWN-96). Based on the addition of these 5 to 7 wells, the flow rate to the south treatment system will be increased by about 5 gpm: and the north treatment system by about 0-2 gpm.

Force main and electrical conduit will be run from new recovery wells RWS-8A and MWS-8B to existing recovery well RWS-8; similarly force main and conduit will be run from RWS-6A, RWS-6B and RWS-7A to existing recovery well RWS-6 as shown on Figure 2. The electrical wiring for the pumps will be pulled through the conduit and connected to a control panel as described below.

The control and operation of the new wells will be completed by installing four new control panels at wells RWS-6, RWS-7, RWS-8 and, if necessary, at well RWN-20. Each new control panel will manage the new recovery wells and the recovery well (e.g., MWS-8, MWS-8A, and MWS-8B will be managed by one controller). The recovery wells will be operated based on groundwater elevation set points that can be adjusted as needed. Groundwater elevation at the recovery wells will be monitored using water level transducers that send a 4-20 mA signal back to the control panel. The new control panel will operate the recovery well pump based on the groundwater elevation. The new control panels will be able to notify the main control panel (located inside the OU-4 treatment building) of high-water levels conditions at the wells it controls. The main control panel will be able to send out alarms from the new recovery wells to TurnKey operations personnel. Similarly, the main control panel will be able to disable the wells controlled by the new control panels, if needed, based on alarms. The new panels will also be equipped with switches that will allow manual operation of individual wells as needed. During the start-up and optimization of the new recovery wells, the goal will be to identify the groundwater elevation set points so that all three wells operate with similar set points and lower the water table accordingly. The new recovery wells pump control set points will start out based on current groundwater elevations and be periodically lowered until groundwater levels are stabilized.

TASK 2 RESULTS- EVALUATION OF POTENTIAL MODIFICATIONS TO THE SOUTH TREATMENT SYSTEM TO IMPROVE REMOVAL OF PFOA/PFAS, NAPHTHALENE, AND PHENOLIC COMPOUNDS.

Existing OU-4 Treatment Systems

The existing OU-4 groundwater remedy includes two (2) independent treatment systems: the northern treatment system which treats the flow from 27 recovery wells from the

northern portion of the groundwater collection system including the area around SWMU P-11A, and the southern treatment system which treats the flow from the 11 recovery wells that comprised the Benzol Yard (SWMU P-11) ICM plus an additional 14 recovery wells in the southern portion of the OU-4 Area. Both systems are housed within the OU4 treatment building and operate on a semi-continuous batch basis (see Figure 1 & 3) initiated by level switches in the influent equalization tanks.

The northern treatment system's remedial components consist of influent holding tank, bag filters, air stripper, and granular activated carbon (GAC) filtration. The southern system's remedial components consist of primary oil water separation, influent holding tank, bag filters, and air stripper, prior to a combined discharge to the infiltration gallery. Existing major remedial components and design flow capacities are provided in Table 1 below.

Table 1

Northern System Components & Design Flow Capacities		
Air Stripper	QED 4.6	50 gpm
GAC Filters (of 2)	TetraSolv - HP 5000	165 gpm
Southern System Components & Design Flow Capacities		
Oil Water Separator	HydroQuip HQI	75 gpm
Air Stripper	QED 8.6	75 gpm

Current operational flows average 10 gpm for the Northern system, and 20 gpm for the Southern system so there is a substantial additional flow capacity available in these treatment units.

Additional Collection Groundwater Volume

Based on the planned additional groundwater collection wells described above, zero to two additional wells will be installed on the northern system; and five additional wells will be installed on the southern system. Based on the average existing well production volume of less than 1 gpm, an additional 0-2 gpm is estimated for the northern collection system (depending on whether and how many additional recovery wells are connected), and an additional 5 gpm is estimated from the southern collection system. Both the northern and

southern treatment systems have the necessary capacity to address the proposed increased flow with remaining reserve capacity (see Table 1 above).

Modification of OU4 Southern Treatment System

As requested by the Department, an evaluation of remedial options to remove secondary constituents, naphthalene, phenolics and PFAS, from the southern treatment system effluent prior to discharge to the infiltration gallery was completed. Based on the demonstrated successful removal of these constituents by GAC filtration in the northern system, this evaluation was focused simply on the capability of the existing two GAC filters of the northern treatment system to effectively handle all or a portion of the flow from southern air stripper including the additional flows from the proposed recovery wells.

GAC Contaminant Removal Capacity

In this application, the GAC capacity to remove the constituents of concern are limited primarily by benzene loading, as it has the highest concentrations in the groundwater and GAC has a higher affinity for naphthalene, PFAS and phenolics. Therefore, benzene concentrations are used in the evaluation.

Laboratory analytical results show post-air stripper benzene concentrations for the northern system average about 0.185 parts per million (ppm), and 0.066 ppm for the southern system. Based on a combined average influent flow of 37 gpm (current and projected additional proposed recovery well flows), the weighted average combined influent concentration for benzene from the northern and southern air strippers to GAC filters would be approximately 0.12 ppm. Current GAC usage, based on the existing northern system flow and influent concentrations are 0.2 lbs/1000 gallon or approximately 2.8 lbs GAC per day. Calculated combined northern and southern systems flow GAC usage are estimated to be 0.14 lbs/1000 gallon or approximately 7.5 lbs GAC per day, or about 2.7 times the current rate. As such, we expect GAC filter changeouts will be approximately 2.7 times more frequent, or about 3 GAC filter changeouts per year based on current operational experience.

Based on the combined post-air stripper effluent from the northern and southern treatment systems, the current dual 5000-lb GAC filters are capable of treating the increased flow and influent concentrations in their current series operation mode.

Proposed Treatment Systems Modification

Based on this evaluation, it is recommended to modify the southern treatment system to redirect the post-air stripper effluent to the northern treatment system GAC filters prior to discharge the combined flows to the effluent equalization tank and subsequently to the infiltration gallery. Modification to the southern system would include internal piping and valves to redirect flow from the southern air stripper effluent to the influent GAC piping. It is recommended to add bag filters prior to GAC influent to reduce precipitant from the air stripping process from entering the GAC vessels (see Figure 3) and causing pressure buildup and reduced flow throughput.

ESTIMATED COSTS TO IMPLEMENT RECOMMENDED MODIFICATIONS

We are in the process of preparing the estimated costs to implement the recommended modifications. The cost estimate will be finalized following Department approval of these proposed modifications.

PROPOSED IMPLEMENTATION SCHEDULE

The estimated schedule for implementing the modifications to OU-4 will be finalized once it has Department approval. The schedule will include final design, subcontractor and equipment procurement, installation of wells, electrical conduit, force main, groundwater sampling including testing and evaluation for the wells associated with the OU4-PZ-6 area, treatment system modifications, and start-up and shakedown. The proposed modifications are expected to require approximately 9 months from Department approval until the construction completion report is submitted.

Please contact us if you have any questions or require additional information.

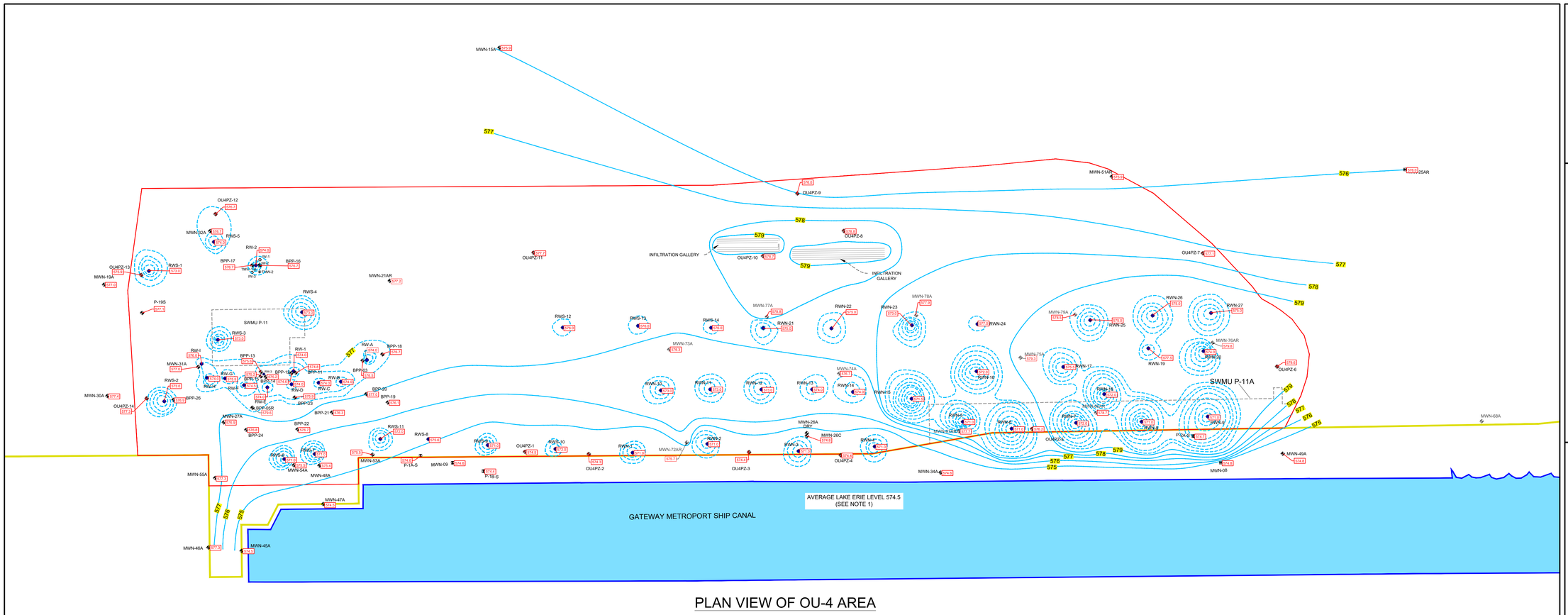
Sincerely,
TurnKey Environmental Restoration, LLC

Paul H. Werthman, P.E.
President

ec: S. Moeller, (NYSDEC)
A. Zwack, (NYSDEC)
K. Nagel, (Tecumseh)
B. Green
N. Munley
R. Laport

File: T0071-020-911

FIGURES



PLAN VIEW OF OU-4 AREA

100' 0' 100' 200'

SCALE: 1 INCH = 100 FEET
SCALE IN FEET
(approximate)

LEGEND:

- TECUMSEH PROPERTY BOUNDARY
- SG-01 — STAFF GAUGE AND SURFACE WATER ELEVATION
- MWN-45A 575 — EXISTING MONITORING WELL AND GROUNDWATER ELEVATION
- RWS-2 575 — GROUNDWATER RECOVERY WELL AND MID-POINT OF ON/OFF ELEVATION
- OU-4 BOUNDARY
- OU4PZ-2 P-1A-S BPP-16 575 — PIEZOMETER LOCATION AND GROUNDWATER ELEVATION
- GROUNDWATER ISOPOTENTIAL (1 FOOT INTERVAL)
- GROUNDWATER DEPRESSION CAUSED BY RECOVERY WELL PUMPING (APPROX.)

NOTES:
1. THE LAKE ERIE WATER LEVEL USED IN DEVELOPING ISOPOTENTIALS IS THE AVERAGE WATER LEVEL ON 7/29/20 FROM THE BUFFALO, NY STATION 9063020 : https://tidesandcurrents.noaa.gov/stationhome.html?id=9063020
2. GROUNDWATER ISOPOTENTIALS SHOWN REPRESENT THE UPPERMOST-SLAG/FILL WATER BEARING ZONE, AND HAVE BEEN INTERPRETED USING THE MEASURED WATER LEVELS AT THE MONITORING WELLS AND THE PIEZOMETERS, AND USING THE MIDPOINT OF THE RECOVERY WELLS ON/OFF SET POINTS.
3. RECOVERY WELL RWS-8 MAY BE INSTALLED IN A BASEMENT OR OTHER STRUCTURE. THE WELL PUMP OPERATES FOR 3 MINUTES AND ONLY LOWERS THE WATER ELEVATION DOWN 0.1'. THE WELL ELEVATION SET POINTS ARE BEING LOWERED METHODICALLY ALBEIT IN SMALL INCREMENTS TO REMOVE THE STORED WATER IN THIS AREA.

PUMP SET POINTS 7/29/20

Section	Leg	Well	Pump Off Bottom Elevation (ft)	Pump On Top Elevation (ft)
North Section	Eastern Leg	RWN-1	570.0	572.0
		RWN-2	570.0	572.0
		RWN-3	570.0	572.0
		RWN-4	570.0	572.0
		RWN-5	570.0	572.0
		RWN-6	570.0	572.0
		RWN-7	571.0	573.0
		RWN-8	570.0	572.0
		RWN-9	570.0	572.0
	Central Leg	RWN-10	572.0	574.0
		RWN-11	572.0	574.0
		RWN-12	572.0	574.0
		RWN-13	573.0	575.0
		RWN-14	573.0	575.0
		RWN-15	570.5	572.5
		RWN-16	571.0	573.0
		RWN-17	574.5	576.5
		RWN-18	571.0	573.0
		RWN-19	576.5	578.5
		RWN-20	573.0	575.0
	Western Leg	RWN-21	574.0	576.0
		RWN-22	574.0	576.0
		RWN-23	572.0	574.0
		RWN-24	576.0	578.0
		RWN-25	574.0	576.0
		RWN-26	574.0	576.0
		RWN-27	574.0	576.0

Section	Leg	Well	Pump Off Bottom Elevation (ft)	Pump On Top Elevation (ft)
South Section	Western Leg	RWS-1	572.0	574.0
		RWS-2	572.0	574.0
		RWS-3	572.0	574.0
		RWS-4	572.0	574.0
		RWS-5	573.0	575.0
		RWS-12	575.0	577.0
		RWS-13	575.0	577.0
		RWS-14	575.0	577.0
	Eastern Leg	RWS-6	570.0	572.0
		RWS-7	570.0	572.0
		RWS-8	575.4	575.8
		RWS-9	570.0	572.0
		RWS-10	571.0	573.0
		RWS-11	571.0	573.0
	BENZOL AREA	RW-1	573.0	575.0
		RW-2	573.0	575.0
		RW-A	573.0	575.0
		RW-B	573.0	575.0
		RW-C	573.0	575.0
		RW-D	573.0	575.0
		RW-E	573.0	575.0
		RW-F	573.5	575.5
		RW-G	574.5	576.5
		RW-H	573.0	575.0
		RW-I	575.0	577.0

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

JOB NO.: 0071-016-922

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY:	RFL
DATE:	JANUARY 2021
CHECKED BY:	BG
APPROVED BY:	PHW

SLAG/FILL GROUNDWATER ISOPOTENTIALS 7/29/20

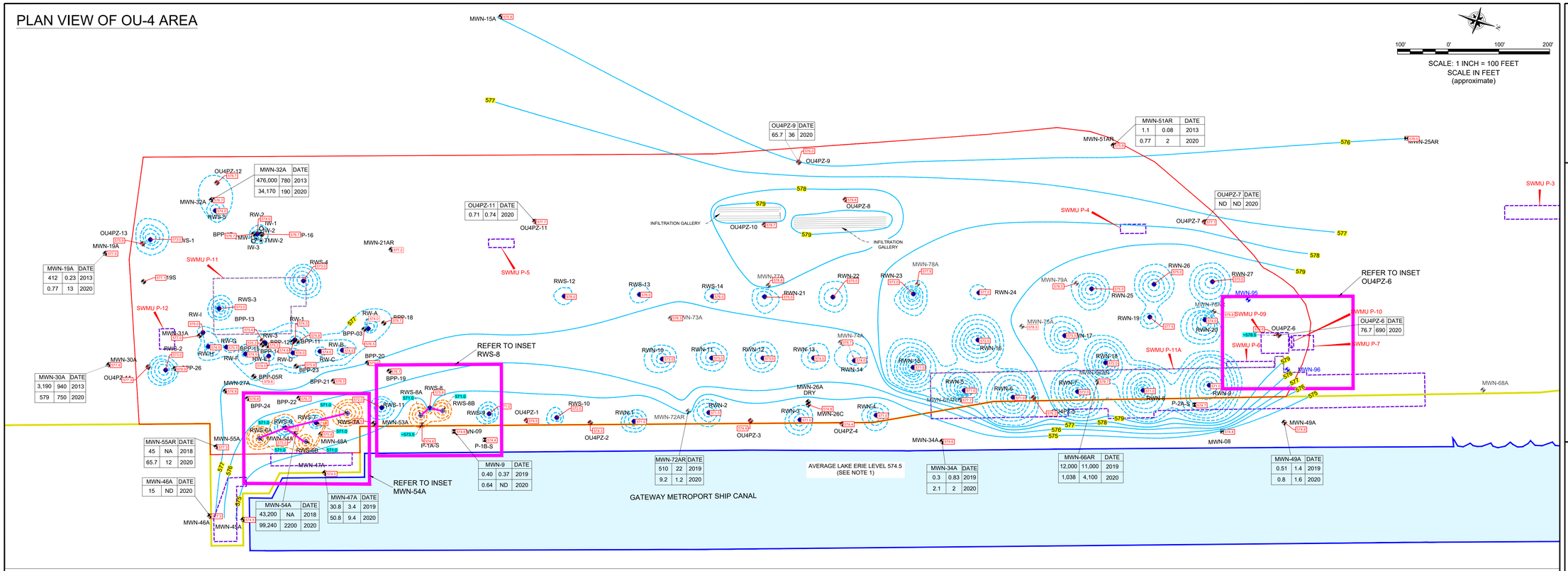
SUMMARY REPORT: SUPPLEMENTAL WORK PLAN FOR OU-4

CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

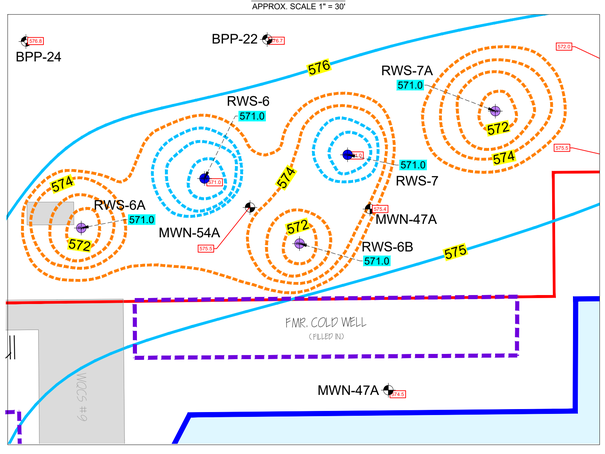
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 1

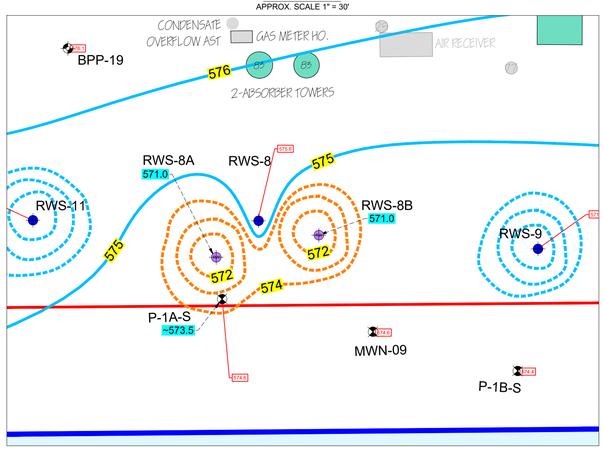
PLAN VIEW OF OU-4 AREA



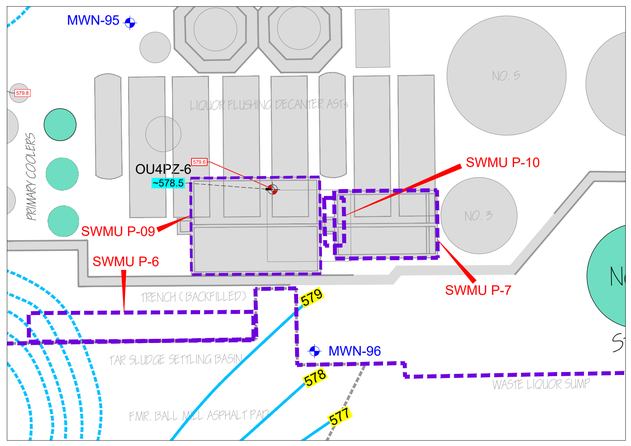
MWN-54A INSET
APPROX. SCALE 1" = 30'



RWS-8 INSET
APPROX. SCALE 1" = 30'



OU4PZ-6 INSET
APPROX. SCALE 1" = 30'



LEGEND:

- SWMU BOUNDARY
- MWN-45A — EXISTING MONITORING WELL AND GROUNDWATER ELEVATION
- RWS-2 — GROUNDWATER RECOVERY WELL AND MID-POINT OF ON/OFF ELEVATION
- OU-4 BOUNDARY
- OU4PZ-2 P-1A-S BPP-16 — PIEZOMETER LOCATION AND GROUNDWATER ELEVATION
- GROUNDWATER ISOPOTENTIAL (1 FOOT INTERVAL)
- GROUNDWATER DEPRESSION CAUSED BY RECOVERY WELL PUMPING (APPROX.)
- EXISTING BUILDING / STRUCTURE
- FORMER BUILDING/STRUCTURE
- PLANNED NEW FORCE MAIN AND ELECTRICAL CONDUIT
- 575.0 — PREDICTED GROUNDWATER ELEVATION IN RESPONSE TO PUMPING FOUR NEW WELLS (RWS-8A, RWS 8B, RWN-28 AND RWN-29)
- GROUNDWATER ISOPOTENTIAL BASED ON ENHANCED GROUNDWATER COLLECTION (APPROX.) FROM THE PLANNED NEW RECOVERY WELLS
- RWN-29 — PLANNED "NEW" RECOVERY WELL (RWS-6A, RWS-6B, RWS-7A, RWS-8A, RWS-8B)
- MWN-92 — PLANNED "NEW" MONITORING WELL (MWN-92 AND MWN-93)

CONCENTRATION TABLES

OU4PZ-11	DATE
0.71	0.74	2020

- DATE COLLECTED
- NAPHTHALENE CONCENTRATION
- BTEX CONCENTRATION
- WELL NUMBER

NOTES:
1. BASEMAP FOR THE ISOPOTENTIALS IS THE JULY 2020 ISOPOTENTIAL MAP (SEE FIGURE 1).
2. THE LAKE ERIE WATER LEVEL USED IN DEVELOPING ISOPOTENTIALS IS THE AVERAGE WATER LEVEL ON 7/29/20 FROM THE BUFFALO, NY STATION 9063020 : https://tidesandcurrents.noaa.gov/stationhome.html?id=9063020
3. GROUNDWATER ISOPOTENTIALS SHOWN REPRESENT THE UPPERMOST-SLAG/FILL WATER BEARING ZONE, AND HAVE BEEN INTERPRETED USING THE MEASURED WATER LEVELS AT THE MONITORING WELLS AND THE PIEZOMETERS, AND USING THE MIDPOINT OF THE RECOVERY WELLS ON/OFF SET POINTS.
4. RECOVERY WELL RWS-8 MAY BE INSTALLED IN A BASEMENT OR OTHER STRUCTURE. THE WELL PUMP OPERATES FOR 3 MINUTES AND ONLY LOWERS THE WATER ELEVATION DOWN 0.1'. THE WELL ELEVATION SET POINTS ARE BEING LOWERED METHODICALLY ALBEIT IN SMALL INCREMENTS TO REMOVE THE STORED WATER IN THIS AREA.

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JOB NO.: 0071-016-922

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: RFL
DATE: JANUARY 2021
CHECKED BY: BG
APPROVED BY: PHW

PLANNED ENHANCED GROUNDWATER COLLECTION

SUMMARY REPORT: SUPPLEMENTAL WORK PLAN FOR OU-4

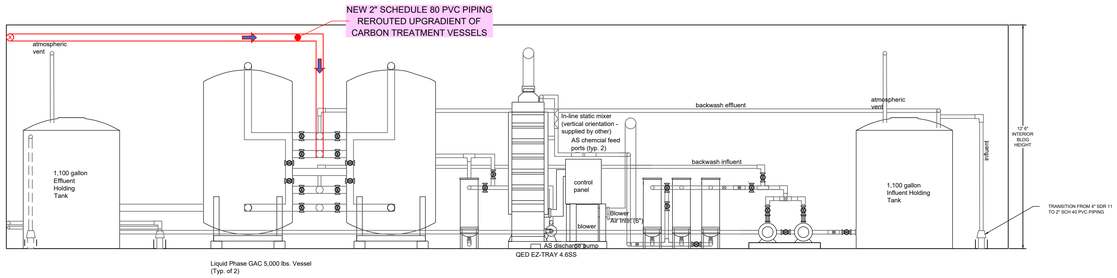
CMS AREA - FORMER BETHLEHEM STEEL SITE
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

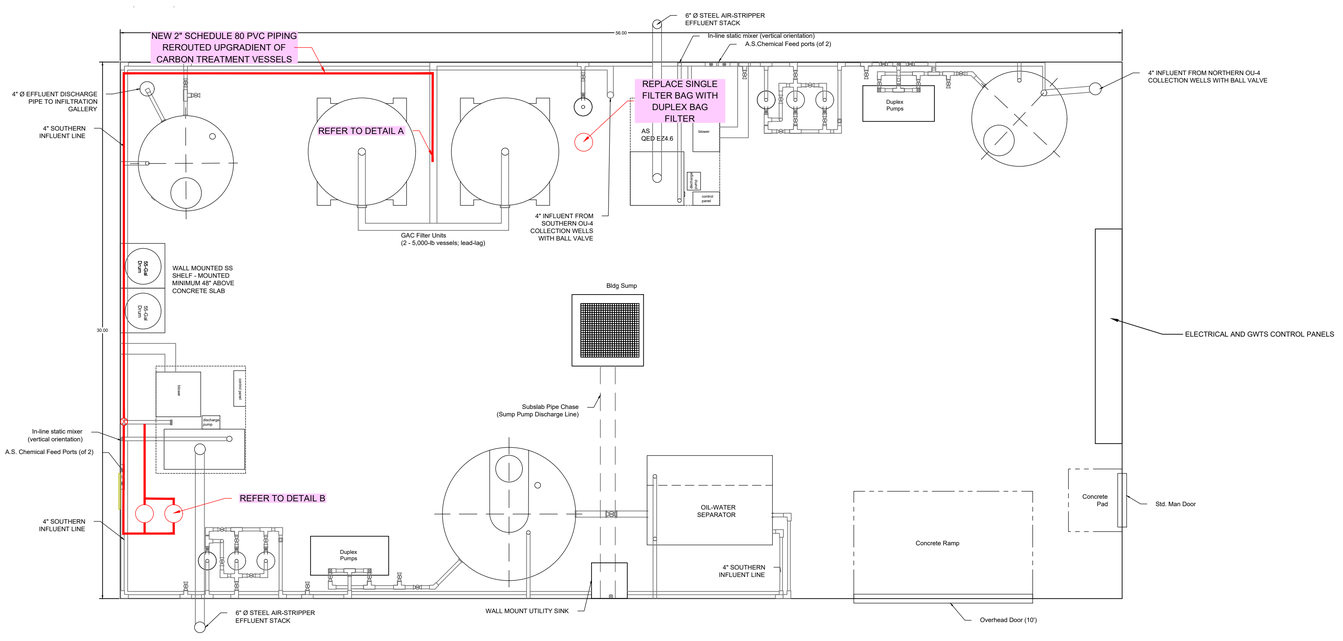
FIGURE 2

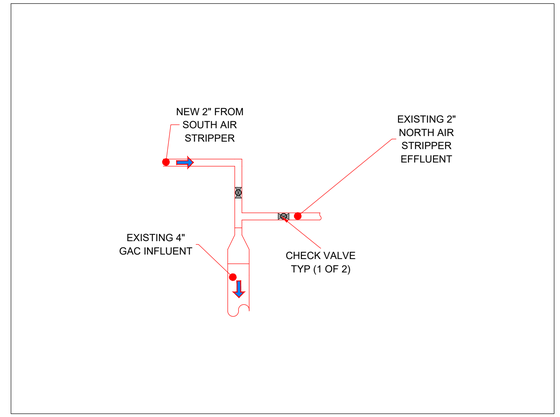
F:\CAD\Turnkey\Tecumseh Redevelopment\Corrective Measures\DCA 4 implementation\2020 Modifications\Figure 3 Dca GWTS TRT EQUIP FLOOR PLAN AND ELEVATIONS.dwg 2/5/2021 12:30:42 PM

NORTHERN GROUNDWATER TREATMENT SYSTEM ELEVATION

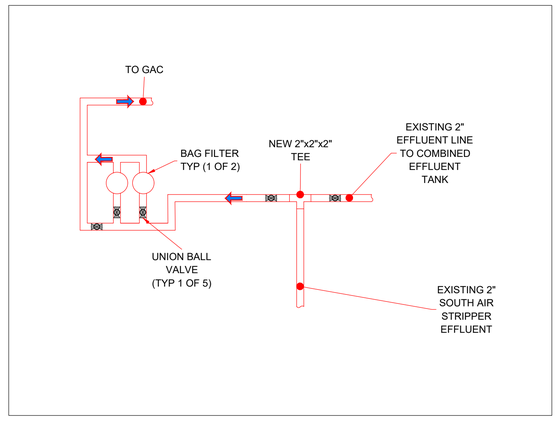


BUILDING FLOOR PLAN AND GWTS LAYOUT



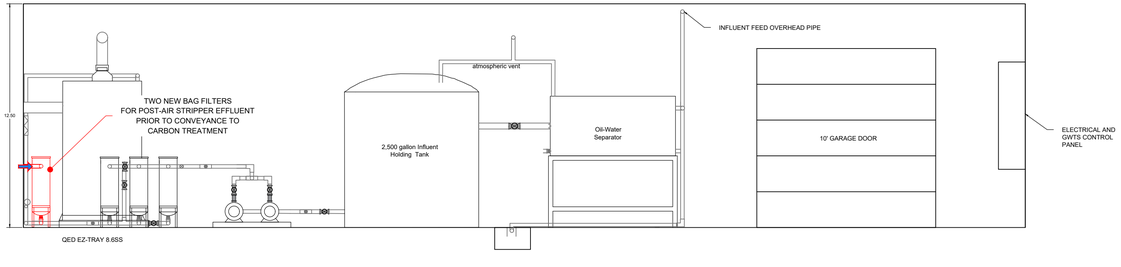


DETAIL A
NTS



DETAIL B
NTS

SOUTHERN GROUNDWATER TREATMENT SYSTEM ELEVATION



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SEAL

TREATMENT BUILDING FLOOR PLAN, ELEVATIONS AND PLANNED MODIFICATIONS

SUMMARY REPORT: SUPPLEMENTAL WORK PLAN FOR OU-4

CMS AREA - FORMER BETHLEHEM STEEL SITE
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FIGURE 3