SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT *ENGINEERING DIVISION* **APPLICATION PROCESSING AND CALCULATIONS**	PAGES 17	PAGE 1
	APPL. NO. 510406/510407	DATE 4/27/2012~~4/26/2012~~
	PROCESSED BY Rafik Beshai	CHECKED BY

PERMIT TO CONSTRUCT

COMPANY NAME BP WEST COAST PRODUCTS LLC
BP CARSON REFINERY

COMPANY ADDRESS P.O. BOX 6210
CARSON, CA 90749

EQUIPMENT LOCATION 2350 E. 223rd STREET
CARSON, CA 90810

FACILITY ID 131003

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
Process 24: GROUNDWATER RECOVERY					
WET WELL, GROUNDWATER RECOVERY WELLS, UP TO A MAXIMUM OF 40 WELLS (18 EXISTING WELLS AS OF APRIL 2012), FOR RECOVERY OF HYDROCARBON IMPACTED GROUNDWATER AND RECOVERED OIL A/N 510406	DX1				D90.X1, E193.X1, K67.X1, K171.X1
FUGITIVE EMISSIONS, MISCELLANEOUS, LIQUID SERVICE ONLY, PIPING AND COMPONENTS TRANSPORTING HYDROCARBON IMPACTED GROUNDWATER FROM RECOVERY WELLS TO TANK NOS. 101, 102, AND 103 A/N 510406	DX2				H23.31, K67.X1
FUGITIVE EMISSIONS, MISCELLANEOUS, LIQUID SERVICE ONLY, PIPING AND COMPONENTS TRANSPORTING REMEDIATION MATERIAL (RECOVERED OIL - ALSO KNOWN AS FREE PRODUCT) FROM RECOVERY WELLS TO TANK R-12 A/N 475031	D2885			HAP: (10) [40 CFR 63 Subpart CC, #5A, 6-23-2003]	H23.3, H23.31

BACKGROUND

BP West Coast Products LLC (BP) has submitted A/Ns 510406/510407 to the District seeking a Permit to Operate for an existing groundwater recovery system at the BP Carson Refinery. A/N 510406 was submitted for the permit of the groundwater recovery system, while A/N 510407 addresses the amendment of the Title V/RECLAIM permit. The applications were submitted in response to a Notice to Comply (NTC) (NTC No. 01289) issued by the District, requiring submittal of the application for permitting of the "Groundwater Remediation System." However, BP and the District's evaluation of the system determined that, as-is, it is not capable of meeting a proposed fugitive VOC emissions leak standard of 500 ppm. Based upon direction from the District, BP has conducted a pilot study to evaluate a new re-designed wellhead. The pilot study, which is on-going, involves retrofitting several wells with the new wellheads and weekly monitoring of fugitive VOC leakage rates over an extended period (six months). In total, four groundwater wells have been retrofitted with the new design wellheads and tested for fugitive VOC leakage rates. These have demonstrated that the new design wellheads are capable of limiting fugitive VOC emissions to under 500 ppm. The District now proposes to issue a Permit to Construct (PC) for modification of the remainder of the groundwater recovery system. The equipment will be listed in the Title V permit under new a process ID (Process 24: Groundwater Recovery). The District issued to BP its initial Title V permit on September 1, 2009.

At this site, hydrocarbon-impacted groundwater is recovered from wells and is transported to Tank No. 101 (Device ID: D1127). Tank Nos. 102 (D1134) and 103 (D1135) are also used in groundwater/process water storage. Recovered Oil, also known as Light Non-aqueous Phase Liquid (LNAPL), from one of the recovery wells is recovered and stored in Tank No. R-12 (Device D1120). Under this evaluation, Device ID D2885 (permitted under A/N 475031) which is the piping and components used to transport Recovered Oil (free-product) from one of the wells to Tank No. R-12, will be listed under the new process, Process 24-Groundwater Recovery. The equipment description in this device will be updated to more accurately describe its function. These amendments are being handled administratively.

PROCESS DESCRIPTION

The groundwater recovery system at the BP Carson Refinery is designed to recover hydrocarbon-impacted groundwater and LNAPL, also referred to as "free product" from below the surface. The system does not collect vapors. Currently, the system includes eighteen recovery wells, pumping equipment and piping used to transfer recovered liquids to storage tanks. Attachment #4 contains a map showing the location of recovery wells and transport piping (note: thee of the recovery wells are outside of the refinery boundary, on the parcel of land southwest of the refinery). All of the wells recover hydrocarbon-impacted groundwater, with one well (Well ID: AMR/152-12) recovering both groundwater and LNAPL. BP indicates that the number of recovery wells may reach up to forty; the construction and removal of groundwater recovery wells is under the direction of the Los Angeles Regional Water Quality Control Board (LARWQCB). Since the beginning of the aforementioned pilot project, four of groundwater wells (Well IDs: AMR/147-12, AMR/149-12, AMR/164-6 and AMR/126-

6) have been determined to be non-critical for plume containment and have been abandoned. Currently, ten recovery wells are equipped with pneumatic pumps and eight wells are equipped with submerged electric pumps for recovery of groundwater. The piston-type pneumatic pumps are mounted on top of the wells and utilize plant compressed air to provide the force necessary for pumping liquids. In general, electric pumps are used in higher yield recovery wells, as for these wells the volume rate of groundwater recovered exceeds the capacity of pneumatic pumps. One well, Well ID: AMR/152-12, utilizes two electric submersible pumps installed in tandem - one recovering LNAPL and the other recovering hydrocarbon-impacted groundwater. Hydrocarbon-impacted groundwater from the groundwater wells is transferred to Tank Nos. 101 (Device ID: D1127), 102 (Device ID: D1134), and 103 (Device ID: D1135). LNAPL, or "free product" from Well ID. ARM/152-12 is transferred to Tank No. 12 (Device: D1120). It should be noted that the transport piping from Well ARM/152-12 to Tank No. 12, carrying free product, is permitted under Device ID: D2885. This device is described as "Fugitive Emissions, Miscellaneous Piping Transporting Remediation Materials (Recovery Oil – Also Known as Free Product) from Recovery Wells to Tank R-12." The hydrocarbon-impacted groundwater from Well AMR/152-12 is transferred to Tank No. 101. Attachment #1 contains schematics of a pneumatic pump and pumping details for groundwater wells equipped with pneumatic pumps and wells equipped with electric pumps.

Since October, 2010 BP has conducted a pilot study to evaluate new wellheads, which are designed to be vapor tight. The re-designed wellheads are intended to retain subsurface vapors, which can reach a pressure of 5 psig, in order to maintain fugitive VOC leakage rates below 500 ppmv. Two wellhead designs have been developed – one for wells with pneumatic pumps and the other for wells with electric pumps. Three wells equipped with pneumatic pumps (Well IDs: AMR/208-6, AMR/209-6 and AMR/241-6) and one well equipped with an electric pump (Well ID: AMR/146-12) have been modified by addition of re-designed wellheads. Subsequently, these wells have been monitored of fugitive VOC emissions leakage by the refinery's Leak Detection and Repair (LDAR) personnel. Weekly monitoring of groundwater wells has been performed for both the modified wells and all remaining (unmodified) wells at the facility. Upon measurement of high VOC readings from either modified or unmodified groundwater wells, BP personnel have performed remedial activities designed to limit VOC leakage rates. These have including tightening of fittings and replacement of fittings/connectors/caps. Attachment #4 is a report for a site visit of BP, conducted by District personnel on November 8, 2011, to evaluate the progress of the pilot study. Attachment #6 contains BP's monthly progress reports for the pilot study.

The re-designed wellheads are intended to limit the fugitive VOC leakage rates from connectors to less than 500 ppmv. The primary concern in modifying wells with electric pumps is the safety concern associated with buildup of hydrocarbon vapors in equipment powered electrically. For these wells (e.g. Well AMR/146-12) the modification includes high pressure seals - sealed conduits - to prevent hydrocarbon vapors from passing through the electrical system to the electric junction boxes. The re-designed wellhead utilizes an "all flange design" in which the wellhead flange and casing are constructed of steel. Steel flanges are equipped with Viton gaskets (⅛ inch or ¼ inch). The connections of pass-through fittings at the wellhead are welded. The re-designed wellhead is installed after cutting

down the existing wellhead to a height of twelve inches above the level of the concrete slab. The fluids pump and the pump discharge pipe (internal to the well) remain the same. A 1 inch diameter discharge flex hose (external to the well) is connected to the well through a 1 inch camlock fitting. This equipment is installed on top of the existing 12 inch diameter chlorinated poly-vinyl chloride (CPVC) well casing. The modified wellhead includes a new pressure indicator. Modification of wells equipped with pneumatic pumps (Well IDs: AMR/208-6, AMR/209-6 and AMR/241-6) involves cutting down wellheads and installation of new flanges and wellhead fittings. The liquid conveyance line and pneumatic pump, which are mounted on top of the wellhead, are connected by flanged connections. The materials are made of CPVC, carbon steel, or stainless steel. The pneumatic pump has a shaft, equipped with seals, which travels through a stuffing box. In order to maintain this equipment vapor tight, BP personnel must periodically (e.g. every three weeks) replace these seals. Groundwater wells are also equipped with sounding tubes for measurement of water level. Attachment #5 shows details of the re-designed wellheads.

BP now seeks issuance of a PC for retrofitting the remaining wells with the re-designed wellheads. However, BP has communicated with the District that not all groundwater wells will be modified. At this site some wells have historical low VOC leakage rates. For these, no modifications are planned. All wells with electric pumps will be retrofitted with the new design wellheads, as for these none of the unmodified wells limit VOC leakage rates to under 500 ppmv. During the November, 2011 site visit District supervisor Tran Vo indicated concurrence with the plan to only modify wells which have experienced high leakage rates (over 500 ppmv). All groundwater wells, those modified with the new design wellhead and the unmodified low leakage rate wells will be covered by and subject to the conditions of the PC to be issued under A/Ns 510406/510407.

BP personnel have taken samples of wellhead vapor and analyzed them for VOC content and Toxic Air Contaminant (TAC) content. These data are found in Attachment #2. Testing for determination of VOC content was performed according to ASTM Method 1945. Analytical results indicate that wellhead vapor, on average, has a VOC content of 13.1% (excluding methane and ethane). Wellhead vapor samples were analyzed for TACs, according to EPA Test Method TO-14. The following TACs were detected (average concentration): Benzene = 0.296 wt%; Toluene = 0.133wt%; Ethylbenzene = 0.024 wt%; m & p Xylenes = 0.044 wt%; o Xylene = 0.018 wt%; and 1,3,5 Trimethylbenzene = 0.009 wt%.

BP personnel obtained samples of hydrocarbon impacted groundwater, as well as LNAPL, and analyzed these samples for VOC and TACs according to Method SW8260B. These data are found in Attachment #3. The tables below list constituents which were detected.

Groundwater VOCs by EPA Test Method SW8260B

TAC	Unit	Sample Taken: 1/28/2009 Header	Sample Taken: 6/30/2009 Header
1,2,4 Trimethylbenzene	ppm, wt	< 1.0	11
1,3,5 Trimethylbenzene	ppm, wt	< 1.0	3.3
Benzene	ppm, wt	76	50
Ethylbenzene	ppm, wt	< 1.0	4.9
Methyl tert-Butyl Ether	ppm, wt	130	86
Naphthalene	ppm, wt	< 1.0	4.2
n-Propylbenzene	ppm, wt	< 1.0	1.5
o-Xylene	ppm, wt	1.1	8.3
Toluene	ppm, wt	28	46
Xylene (total)	ppm, wt	< 4.0	29
m, p-Xylene	ppm, wt	2.8	21
Total VOC	ppm, wt	238	233

LNAPL VOCs by EPA Test Method SW8260B

TAC	Unit	Sample Taken: 1/28/2009 Header C	Sample Taken: 6/30/2009 Header C
1,2,4 Trimethylbenzene	mg/kg	23000	6400
1,3,5 Trimethylbenzene	mg/kg	7100	2500
2-Methyl Pentane	mg/kg	140000	NA
Benzene	mg/kg	33000	5500
Ethylbenzene	mg/kg	13000	3600
Isopropylbenzene	mg/kg	540	260
Methyl tert-Butyl Ether	mg/kg	7400	390
Naphthalene	mg/kg	3700	1300
n-Propylbenzene	mg/kg	3600	1200
o-Xylene	mg/kg	18000	5300
Sec-Butylbenzene	mg/kg	< 980	140
Toluene	mg/kg	68000	15000
Xylene (total)	mg/kg	73000	19000
m, p-Xylene	mg/kg	55000	14000
Total VOC	mg/kg	373,340	55,358
	mg/l	260,638	38,751

Notes: NA = Chemical not analyzed
mg/l based on average system LNAPL density of 700 kg/m3

EMISSION CALCULATION

Emissions of VOC are expected from the wellheads of the groundwater recovery system and from above ground piping/components. These emissions rates are calculated below.

Controlled VOC Emissions

Emissions of VOC from the modified groundwater recover system are calculated as follows:

VOC Emissions (lbs/yr) = [Number of Wells] x [Emissions Factor (lbs/yr)] x [VOC Content Factor]

= 40 Wells x 9.09 lbs/yr/Well x 0.131 lbs VOC/lb hydrocarbons emitted

= 47.63 lbs/yr, 0.0054 lbs/hr, or 0 lb/day – 30 day average

The basis of this calculation is as follows:

Number of Wells: the number of active groundwater recovery wells may change depending on their effectiveness in plume containment and direction from the LARWQCB. The number of recovery wells may be as high as 40 wells.

Emissions Factor: emissions factor for "drains" from the CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals. The "drain" is the device most similar to a "well" due to the presence of free standing liquid and an air-to-liquid interface. As directed by the CAPCOA guidelines, the emissions factor for "Others" is used for drains. A Screening Value (or maximum leakage rate) of 500 ppmv is assumed.

VOC Content Factor: samples of vapor in well casing were taken by BP and analyzed according to method ASTM D1945. The average VOC content (excluding methane and ethane) was determined to be 13.1%, by weight.

VOC emissions from piping/components carrying hydrocarbon-impacted water, are calculated in the table below:

Fugitive VOC Emissions from Components Handling Hydrocarbon-Impacted Groundwater

New Source Unit		Service	Number of Components in Exipanded System	VOC Emissions Factor (lb/yr)	VOC Adjustment Factor	Annual Emissions (lbs/yr)
Valves	Sealed Bellows	Gas/Vapor and Light Liquid	0	0.0	0.00284	0.00
	SCAQMD Approved I & M Program	Gas/Vapor	0	4.55	0.00284	0.00
		Light Liquid	333	4.55	0.00284	4.30
		Heavy Liquid	0	4.55	0.00284	0.00
Pumps	Seal-less Type	Light Liquid	0	0	0.00284	0.00
	Double Mechanical Seals or Equivalent Seals	Light Liquid	20	46.83	0.00284	2.66
	Single Mechanical Seal	Heavy Liquid	0	46.83	0.00284	0.00
Compressors		Gas/Vapor	0	9.09	0.00284	0.00
Flanges and Connectors		All	2965	6.99	0.00284	58.86
Pressure Relief Valves		All	5	9.09	0.00284	0.00
Process Drains with P-Trap and Seal Pot		All	0	9.09	0.00284	0.00

Total Lbs/yr	65.82
Total Lbs/day	0
Total Lbs/hr	0.0075

Notes: VOC Emissions factors are derived using the CAPCOA Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals, with a 500 ppm Screening Value.
One-half (20) of the groundwater pumps are above-ground pneumatic pumps, the remainder are submerged electric pumps.
VOC Adjustment Factor is the weight percentage of VOC in the hydrocarbon-impacted groundwater. This factor is from analysis of groundwater and LNAPL samples, according to method SW8260B, and a fluid makeup of 99% water and 1% LNAPL. See Attachment #3.

Controlled VOC emissions: groundwater recovery wells and piping/components

113.45 lbs/yr, 0.31 lbs/day (0 lb/day – 30 day average), 0.013 lbs/hr

Uncontrolled VOC Emissions

Emissions of VOC from the groundwater recover system, without modification, are calculated as follows:

VOC Emissions (lbs/yr) = [Number of Wells] x [Emissions Factor (lbs/yr)] x [VOC Content Factor] + Fugitive VOC Emissions from Components Handling Hydrocarbon-Impacted Groundwater

= 40 Wells x 445.8 lbs/yr/Well x 0.131 lbs VOC/lb hydrocarbons emitted + 65.82 lbs/yr

= 2,401.8 lbs/yr, 6.58 lbs/day, 0.27 lbs/hr

Emissions Factor: emissions factor for "drains" from the CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals. A Screening Value (or maximum leakage rate) of 214,928 ppmv is used. This is the average maximum leakage rate the groundwater wells, as determined from monitoring during pilot study. The maximum leakage rates measured for each well are summarized below. The correlation equation, in lbs/hr, is 1.92E-05(SV)^0.642.

Maximum Leakage Rate- As Monitored During Pilot Study Through October, 2011

Well ID	Maximum VOC Leakage Rate (ppmv)
AMR/208-6	176,800
AMR/209-6	42,699
AMR/241-6	500,000
AMR/126	500,000
AMR/135	68,000
AMR/145	903,000
AMR/146-12	500,000
AMR/147-12	1,575
AMR/148-12	15,000
AMR/149-12	32,400
AMR/150-12	365,400
AMR/151-12	338,000
AMR/152-12	442,600
AMR/164-6	139,100
ANP/167-6	16,299
ANP/168-6	1,925
ANP/169-6	29,800
AMR/187-6	35
AMR/242-6	11,000
Average Maximum	214,928

TAC Emissions

Emissions of TACs from the subject equipment are quantified below. TAC emissions are calculated as the product of the weight percentage of TACs in the vapor (maximum TAC concentrations determined from analyses of wellhead vapors according to USEPA Method TO-14) and the controlled total VOC emissions from this equipment.

TAC Emissions from Groundwater Recovery System

TAC	Weight % in Wellhead Vapor	Total VOC Emissions From Groundwater Recovery System (lbs/yr)	TAC Emissions (lbs/yr)
Benzene	1.23	113.45	1.395
Toluene	0.65	113.45	0.737
Ethylbenzene	0.06	113.45	0.068
m & p Xylenes	0.22	113.45	0.250
o Xylene	0.07	113.45	0.079
1,3,5 Trimethylbenzene	0.01	113.45	0.011

RULE EVALUATION

CEQA: The CEQA Applicability Form (400-CEQA) submitted by the applicant indicates that the project does not have any impacts which trigger the preparation of a CEQA document. The expected impacts of the project on the environment are not significant, therefore preparation of an Environmental Impact Report (EIR) is not required.

Rule 212: Rule 212 requires public noticing for a new source or a modification of a source subject to Regulation XX if it is within 1000 feet of a school. The subject equipment is not within 1000 feet of a school. Rule 212 requires noticing when the emission increase exceeds any of the daily maxima specified in Rule 212 (g). As shown in the Emission Calculation section, VOC emissions from the groundwater recovery system are not expected to exceed 30 lbs VOC/day – the limit stated in 212(g). Public noticing is also required for a new source or a modification of a source which results in an increase in TAC emissions such that the Maximum Individual Cancer Risk (MICR) is greater than 1 in a million ($1x10^{-6}$) during a lifetime of 70 years. Emissions of TACs from the groundwater recovery system are expected to be very low, meeting the Tier II screening procedures (Attachment #7). Therefore, the expected increase in MICR due to exposure to TACs is less than $1x10^{-6}$. Public noticing is not required for this project and the requirements of Rule 212 are met.

Rule 401 With proper operation and maintenance the groundwater recovery system is not expected to produce visible emissions with a shade as dark as or darker than that designated Ringelmann No. 1 by the US Bureau of Mines, for a period of 3 minutes in any hour. Therefore, compliance with this rule is expected.

Rule 402 With proper operation and maintenance the groundwater recovery system is not expected to result in a public nuisance. Compliance with this rule is expected.

Reg IX 40 CFR 60 Subpart QQQ – Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems states standards for individual drain systems and oil water separators at petroleum refineries, which underwent construction, modification, or reconstruction after May 4, 1987. These standards apply to wastewater systems, which receive, treat or process oily water from refinery process units. The groundwater recovery system is not a drain system or oily water separator, receiving oily water from refinery process units. Therefore, the groundwater recovery system is not subject to the requirements of this regulation. This system transfers groundwater to Tank 101, from which oily water is directed to the Benzene NESHAP Unit (Process 15, System 7) for treatment.

40 CFR 60 Subpart GGG - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006. This regulation states standards for equipment leaks from process units, defined as follows, "process unit means components assembled to produce intermediate or final products from petroleum, unfinished petroleum derivatives, or other intermediates; a process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product." The groundwater recovery system is not a "process unit," as defined this regulation and therefore is not subject to these standards.

Rule 1173 Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants. This rule specifies leak control, identification, operation, inspection, maintenance, and recordkeeping requirements for components transporting VOC containing materials at refineries. The groundwater recovery system includes piping/components transporting hydrocarbon impacted groundwater (Device ID: DX2), which has a VOC content of less than 10% by weight. Per 1173(l)(1)(D), this equipment is exempt from the requirements of this rule. The groundwater wellheads, including those used in recovery of both groundwater and LNAPL, may contain vapors with a VOC content exceeding 10% by weight. However, attachments to the groundwater wellheads do not meet the definition of "component" under this rule and therefore are not subject to its requirements. Thus, the groundwater recovery system is exempt from the requirements of this rule.

Rule 1176 VOC Emissions from Wastewater Systems. This rule states standards for wastewater systems and associated control equipment, located at petroleum refineries. Per 1176(i)(5)(F) all of the provisions of this rule shall not apply to components (e.g. valves, fittings, pumps, compressors, pressure relief devices, etc…) which are exempt from the

requirements of Rule 1173. As discussed above, the piping/components associated with the groundwater recovery system are exempt from Rule 1173, since they transport hydrocarbon impacted water with a VOC content of less than 10% by weight. Therefore, this equipment is exempt from the requirements of Rule 1176.

Reg XIII This rule states requirements including that projects meet standards considered Best Available Control Technology (BACT), that emissions offsets be provided for increases in non-attainment air contaminant emissions, and that modeling is performed to assess the impacts of the project on ambient air quality. Since uncontrolled VOC emissions from the groundwater recovery system exceed 1.0 lbs/day, it is subject to BACT requirements. Proposed conditions D90.X1 and E193.X1 state BACT standards for the groundwater recovery system. These include installation of vapor tight wellheads (as indicated by VOC leak rates of less than 500 ppmv), periodic monitoring of VOC leak rates, and repair of components found to be leaking within 14 days of leak detection. Since controlled VOC emissions from the groundwater recovery system are less than 0.5 lbs/day, emissions offsets are not required. Modeling applies to emissions of NOx, CO and Particulate Matter. Since the groundwater recovery system does not emit these pollutants, modeling does not apply to this project.

Rule 1401 This rule requires that TAC emissions from new, relocated, or modified equipment not result in an increase in Maximum Individual Cancer Risk (MICR) of $1x10^{-6}$ if T-BACT is not applied, or $10x10^{-6}$ if T-BACT is used, that chronic and acute hazard indices not exceed 1.0, and the cancer burden not exceed 0.5. The Tier II Screening Heath Risk Assessment (Attachment #7) indicates that TAC emissions from the groundwater recovery system results in an increase in MICR of less than $1x10^{-6}$ (Residential MICR of $1.11x10^{-7}$ and Off-Site Worker MICR of $1.71x10^{-7}$). Thus, compliance with the requirements of this rule is demonstrated.

Reg XVII This rule applies to increases in emissions of pollutants for which attainment with ambient air quality standards has been achieved in the South Coast Air Basin (i.e. NO_2, SO_2, and CO). The groundwater recovery system does not emit these pollutants and therefore Reg XVII requirements do not apply to this project.

Reg XX The facility is a part of the District's RECLAIM program and therefore is subject to RECLAIM requirements. However, the groundwater recovery system does not emit NO_x or SO_2 and therefore RECLAIM requirements do not apply to this equipment.

Reg XXX The facility is subject to Reg XXX. The initial Title V permit was issued to this facility on September 1, 2009. As defined under Rule 3000, permitting of the groundwater recovery system involves a De Minimis Significant Revision of the BP Title V permit. The project is deemed a De Minimis Significant Permit Revision as pollutant emissions from the groundwater recovery system are below limits stated in Table 1 of Rule

3000(b)(7). As a De Minimis Significant Permit Revision it is subject to EPA's 45 day review and comment process but is not subject to public noticing requirements under Rule 3006.

40 CFR 61, Subpart FF

National Emission Standard for Benzene Waste Operations (Benzene Waste NESHAP) defines a major source as any chemical manufacturing plant, coke by-product recovery plant, or petroleum refinery with 10 megagram per year (Mg/yr) (11 tons/yr) or more of benzene in the waste streams. The BP Carson Refinery is a major source subject to the control requirements of this regulation. Under this regulation a major source must control benzene in non-exempt waste streams which contain 10 ppmw of benzene. It requires removal or destruction of benzene in a waste stream using a treatment process or wastewater treatment system that either a) removes benzene from a waste stream to a level of less than 10 ppmw on a flow-weighted annual average basis, or b) removes benzene from a waste stream by 99% or more on a mass basis, or c) destroys benzene in the waste stream by incinerating the waste in a combustion unit which achieves a destruction efficiency of 99% or greater for benzene. This rule states standards for tanks (§61.343 and/or §61.351), surface impoundments (§61.344), containers (§61.345), individual drain systems (§61.346), and oil-water separators (§61.347). Tank No. 101 (D1127) – the groundwater storage and NESHAP Unit feed tank, Tank Nos. 102 (D1134) and 103 (D1135) – process water storage NESHAP Unit Feed tanks, and Tank No. R-12 – recovered oil storage tank, will continue to be operated in compliance with standards stated under §61.343(a), (c), and (d). Tank covers and openings must be operated with no detectable emissions, as indicated by an instrument reading less than 500 ppm VOC above background, tested initially and annually thereafter. Thus, all equipment storing benzene waste from groundwater wells is tagged with applicability of this regulation. Continued compliance with this regulation is expected. This regulation does not apply to the groundwater recovery system.

40 CFR 63, Subpart CC

This regulation is applicable to facilities which are major sources of Hazardous Air Pollutants (HAP)s, defined as those with a potential to emit 10 tons per year of a single HAP or potential to emit 25 tons per year of a combination of HAPs. It states standards known as Refinery MACT for miscellaneous process vents (§63.643 - §63.645), storage vessels (§63.646), wastewater management and treatment equipments (§63.647), equipment leak (fugitive) components (§63.648 & §63.649), gasoline loading racks (§63.650), and marine tank vessel loading operations (§63.651). Equipment leaks are defined as emissions of organic hazardous air pollutants from pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, or instrumentation system "in organic hazardous air pollutant service." Vents from wastewater collection and conveyance systems, tank mixers, and sample valves on storage tanks are not equipment leaks. "In organic hazardous air pollutant service" is defined as equipment either containing or contacting a fluid which has total organic HAPs of least 5%, by weight. Since wellhead vapor and hydrocarbon impacted groundwater have HAP contents under 5%, by weight (see Attachment #2 for wellhead vapor

analyses and Attachment #3 for groundwater analyses) leak standards under this regulation do not apply.

40 CFR 63, Subpart GGGGG

This regulation establishes emissions limitations and work practice standards for equipment in site-remediation-material (containing HAPs) service. Equipment for which standards are stated includes Process Vents, Remediation Material Management Units (e.g. storage tanks used to manage remediation material, transfer systems to remove remediation material), and Equipment Leaks.

Piping transferring groundwater and recovered materials from groundwater wells is subject to Transfer System requirements of this regulation, if handling material with volatile organic HAPs exceeding 500 ppm. BP's evaluation (Attachment #3) of material conveyed by groundwater recovery piping is that it may have a VOC content of 0.284%, by weight (or 2840 ppmw). Requirements for Transfer Systems, which are not individual drain systems, include one of the following: 1) use covers according to the requirements of 63.689(d); 2) the Transfer System must consist of continuous hard piping and all joints or seams between pipe sections must be permanently or semi-permanently sealed (e.g. welded joint between two sections of metal pipe or bolted and gasketed flanges); 3) the Transfer System must be enclosed and vented through a closed vent system to a control device. Annual inspection for leaks/defects of the unburied portion of the pipeline and joints is required. First effort to repair must be made no later than 5 days after defect/leak detection and the repair must be completed no later than 45 days after detection (unless emptying or removal from service of the Transfer System is required, in which case the repair must be made the next time the source of the remediation material is taken out of service). BP states that the facility performs inspections that meet these requirements. New device DX2 will be tagged with condition H23.31, requiring that the groundwater system piping be maintained in compliance with this regulation.

Equipment Leak standards apply to components (e.g. pumps, valves) which are in contact with remediation material having a total HAP concentration of equal to or greater than 10% by weight and which operate more than 300 hours in a calendar year in remediation material service. Piping and components conveying LNAPL from recovery wells to Tank R-12 (Device ID: D2885) are subject to this regulation, as this material is at least 10% HAPs by weight and the components operate more than 300 hours per calendar year in remediation material service. Equipment Leak standards under 40 CFR 63.7920 require compliance either with 40 CFR 63 Subpart TT – National Emission Standards for Equipment Leaks – Control Level 1; or 40 CFR 63 Subpart UU – National Emission Standards for Equipment Leaks – Control Level 2. BP states that this site remediation equipment is operated in compliance with 40 CFR 63 Subpart TT.

Tank R-12 (Device ID: D1120) is subject to the Remediation Management Unit standards under this regulation. A fixed roof tank venting to a control device must be in compliance with requirements under 63.685.

- For a fixed roof tank venting to a control device, the control device must be in operation at all times to process vapors containing HAPs (except in cases of routine maintenance or to correct malfunction of the closed vent system). The control device is required to control total HAP or TOC emissions by 95%, by weight, or to limit the concentration of total HAPs or TOC to a maximum of 20 ppmv, dry basis corrected to 3% O_2, by use of a combustion device.
- As an alternative to meeting the control/emissions standards described above, the facility may meet one of the following work practice standards if a process heater or boiler is used as the control device: introduce the vent stream into the flame zone and maintain a residence time of 0.5 seconds at 760°C in the combustion chamber, introduce the vent stream with the fuel gas which is the primary fuel to the heater/boiler, or introduce the vent stream into a boiler/heater which has been issued a permit under 40 CFR Part 270 and complies with the requirements of 40 CFR Part 266.
- For fixed roof tanks venting to a control device, initial and periodic visual inspection of the tank and closure devices are required. Periodic monitoring, inspection, and repair of the closed vent system are also required.

Tank R-12 (Device ID: D1120) vents to the refinery vapor recovery system, which supplies combustion devices with fuel gas. This system meets the control system requirements under 63.7925 by directing vent vapors with the fuel gas (primary fuel) into heaters/boilers.

The facility is required to develop a written startup, shutdown, and malfunction plan, according to the provisions in 63.6(e)(3). Continued compliance with this regulation is expected.

40 CFR 63, Subpart TT

This regulation states equipment leak standards for equipment subject to another subpart (e.g. 40 CFR 63 Subpart GGGGG), where the other applicable subpart references 40 CFR 63 Subpart TT. BP states that the pipeline transporting LNAPL from recovery well AMR/152-12 to Tank R-12 (Device ID: D2885) is operated in compliance with these requirements. The regulation states requirements for equipment identification, instrument and sensory monitoring for leaks, leak repair, standards for valves in gas/vapor and light liquid service, standards for pumps in light liquid service, standards for connectors in gas/vapor and light liquid service, standards for agitators in gas/vapor and light liquid service, standards for pressure relief devices in gas/vapor service, standards for compressors, standards for sampling connection systems, standards for open ended valves or lines, standards for a closed vent system and control device (or emissions routed to a fuel gas system or process), and standards for

pumps/valves/connectors/agitators in heavy liquid service - pressure relief devices in liquid service - and instrumentation systems.

Requirements are stated for connectors in light liquid service. These include monitoring of all connectors within 5 days if a potential leak is found by visual, auditory, olfactory, or other detection method. A leak is defined by an instrument reading of 10,000 ppm or greater. A leak shall be repaired within 15 days of detection.

Requirements are stated for valves in light liquid service. These include monthly monitoring, unless no leak is detected for two successive months, then the frequency may be changed to quarterly monitoring. An alternative monitoring frequency may be used if the percent of valves leaking is less than 2.0 for an affected facility or process unit. An instrument reading of 10,000 ppm or greater, defines a leak. A leak must be repaired within 15 days of detection and first attempt at repair must be made no later than 5 days after detection. A valve must be monitored within the first 3 months after repair. Any equipment located at a facility with fewer than 250 valves in regulated material service is exempt from the monthly monitoring requirement; instead each valve in regulated material service must be monitored quarterly.

Requirements are stated for pumps in light liquid service. These include monthly monitoring. Perform weekly visual inspections of pumps, for indication of liquid dripping. An instrument reading of 10,000 ppm or greater, defines a leak. A leak must be repaired within 15 days of detection and first attempt at repair must be made no later than 5 days after detection. However, the LNAPL pump in Well AMR/152-12 is a submerged electric pump and therefore is not subject to monitoring requirements of this regulation.

Continued compliance with the requirements of this regulation is expected.

RECOMMENDATIONS

Issue the Permit to Construct with the following permit conditions.

D90.X1 The operator shall periodically monitor the VOC concentration at the wellheads and associated components according to the following specifications:

The operator shall periodically monitor VOC leak emissions from groundwater recovery well caps, pumps (except submerged pump(s)), fittings, and hatches. The operator shall monitor emissions monthly for the first three (3) months following construction and quarterly thereafter. Monitoring shall be according to EPA Test Method 21, with methane as the calibrating agent.

A VOC emissions leak shall be defined as detected VOC emissions of greater than 500 ppmv. All VOC emissions leaks shall be repaired within 14 days of detection.

The operator shall keep records of each inspection, subsequent repair, and re-inspection, in a manner approved by the District.

[**RULE 1303(a)(1)-BACT, 5-10-1996;** RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition: DX1]

E193.X1 The operator shall construct this equipment according to the following specifications:

The groundwater recovery system shall be retrofitted with wellheads with a vapor tight design, as indicated by VOC leakage rates of less than or equal to 500 ppmv. In cases where monitoring of wellheads indicates that this limit has not been exceeded historically, no equipment modification is required.

All modifications of existing groundwater wellheads, by replacement with the vapor tight design wellheads, shall be completed within 180 days of issuance of the Permit to Construct under A/N 510406. All new groundwater recovery wells constructed after the date the Permit to Construct is issued, shall be equipped with the modified vapor tight design wellhead.

[**RULE 1303(a)(1)-BACT, 5-10-1996;** RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition: DX1]

H23.3 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173
VOC	40CFR60, SUBPART	GGG

[**RULE 1173, 5-13-1994;** RULE 1173, 2-6-2009; **40CFR 60 Subpart GGG, 6-2-2008**]

[Devices subject to this condition: D2885]

H23.31 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
HAPs	40CFR63, SUBPART	GGGGG

[40CFR63 Subpart GGGGG, 11-29-2006]

[Devices subject to this condition: D2885, DX2]

K67.X1 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The operator shall maintain an updated site plan showing the locations of all groundwater recovery wells and associated piping and components.

Records shall be retained for a period of five years and made available to the Executive Officer upon request.

[**RULE 1303(b)(2)-Offset, 5-10-1996**]

[Devices subject to this condition: DX1, DX2]

K171.X1 The operator shall provide to the District the following items:

Final drawings and/or specifications of the equipment installed/constructed shall be submitted to the SCAQMD within 60 days after construction.

A final report for the Groundwater Recovery System Pilot Test shall be submitted to the SCAQMD within 30 days of completion of field monitoring activities. The report shall include all monitoring results and conclusions regarding the efficiency of the redesigned wellheads in controlling VOC emissions.

[**RULE 1303(a)(1)-BACT, 5-10-1996;** RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition: DX1]