FLINT HILLS resources®

Corpus Christi Refineries

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Corpus Christi, Texas 78403-2608

May 16, 2013

David F. Garcia
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Flint Hills Resources Corpus Christi, LLC - West Refinery
PSD Greenhouse Gas Permit Application
Domestic Crude Project
Response to Information Request
Corpus Christi, Nueces County

Dear Mr. Garcia:

On behalf of Flint Hills Resources Corpus Christi, LLC (FHR), I am submitting responses to the information request dated April 25, 2013 for the PSD Greenhouse Gas (GHG) permit application submitted on December 18, 2012 to authorize a project at FHR's West Refinery to allow the refinery to process a larger percentage of domestic crude oil. Responses are provided on the following pages. Additional information is provided in the attachments

Completeness of Application. While this letter responds to EPA's request for additional information to make a completeness determination, we believe that EPA's guidance on what constitutes a complete application demonstrates that a complete application was submitted by FHR. FHR submitted its major GHG PSD application on December 18, 2012 and its Biological and Cultural Resources Assessment on January 15, 2013. Specifically, the original application included each of the following elements of a complete application as described in Appendix A of the October 15, 2012, EPA Memorandum, "Timely Processing of Prevention of Significant Deterioration (PSD) Permits when EPA or PSD-Delegated Air Agency Issues the Permit."

(1) Project overview and description;
(2) PSD applicability section
(3) A "top-down" BACT analysis for each regulated NSR pollutant subject to major PSD review
(4) Air quality analysis for NAAQS and PSD Increments, as applicable";
(5) Analysis of Class I area impacts;
(6) Analysis of impacts on visibility, soil, vegetation, and associated growth for the proposed project or new source;
(7) Compliance with other emissions standards or standards of performance (such as NSPS);
(8) Non-Clean Air Act requirements such as the ESA; and
(9) Confidential Business Information claims

Biological Assessment and Cultural Resource Reports. EPA's request may indicate that EPA has not received the biological assessment or cultural resource report that FHR agreed to prepare in support of the GHG PSD permit application. Note; however, that FHR submitted the biological assessment and cultural resource reports to EPA on January 15, 2013.

We believe that this letter and the associated attachments have addressed EPA Region VI's questions regarding FHR's West Refinery GHG PSD permit application. We look forward to continuing to work closely with EPA towards issuance of this permit.

In the event you have additional questions or would like to discuss further, please contact Daren Knowles at (361) 242-8301.

Sincerely,

Valerie Pompa
Vice President and Manufacturing Manager

VP/DK/syw
Air 13-176; W 3 N 22

Enclosure

cc: Air Section Manager, TCEQ, Region 14, Corpus Christi, w/enclosure
Mr. Kris L. Kirchner, P.E., Waid Environmental, Austin, w/enclosure

RESPONSES TO INFORMATION REQUEST

1. **Please provide an additional impacts analysis as required by 40 CFR 52.21(o). Note that the depth of your analysis will generally depend on existing air quality, the quantity of emissions, and the sensitivity of local soils, vegetation, and visibility in the impact area of your proposed project. In your analysis, please fully document all sources of information, underlying assumptions, and any agreements made as a part of the analysis.**

Response from FHR

As explained in Section 11 of the application, according to EPA's PSD Guidance for Greenhouse Gases, "EPA believes it is not necessary for applicants or permitting authorities to assess impacts from GHGs in the context of the additional impacts analysis or Class I area provisions of the PSD regulations."[1] Of course, as EPA explained when it adopted the Tailoring Rule, "if a facility triggers [PSD] review for regulated NSR pollutants that are non-GHG pollutants for which there are established NAAQS or increments, the air quality, additional impacts, and Class I requirements would apply to those pollutants."[2]

As explained in Section 3.0 of FHR's permit application, this project—including construction of the new emission units, changes to existing emission units, and emissions increases from upstream and downstream affected units—will not trigger federal PSD for any non-GHG new source review (NSR)-regulated pollutants. In fact, the overall project will result in decreased emissions of non-GHG NSR-regulated pollutants.

Therefore, because it is not necessary to assess impacts from GHGs in the context of the additional impacts analysis, and because the project does not trigger PSD review for any other pollutant, FHR believes that an additional impacts analysis under 40 CFR Section 52.21(o) is not required for this permit application. Nevertheless, and without waiving or otherwise compromising its position, FHR is providing an additional impacts analysis in Attachment A.

2. **The process description should closely follow the process diagram that is provided and identify all emission points and provide the emission point number (EPN) for GHG emission sources. The process flow diagram should include all equipment including non-GHG sources that is an integral part of the process operations. Please supplement the process flow diagrams with the following information:**

   A. **It is not clear if the following emission units are new, modified or affected (existing non-modified) emission units: Charge Heater (EPN: JJ-2) and XRC RBLR (EPN: JJ-6) found on the CCR/TOL unit process diagram; Charge Heater (EPN: JJ-4) found on NHT Unit process flow diagram; Charge Heater (EPN: KK-3) found on DHT Unit process flow diagram; and Charge Heater (EPN: A-204) found on the Mid Crude process flow diagram. In addition to providing supplemental information for the listed emission sources, please indicate if it is intentional to have identically numbered emission sources for the Charge Heaters (EPN: A-103) found on the West Crude process flow diagram for the Vacuum and Crude Towers. Please provide supplemental notation on the process flow diagram to explain all of the previously mentioned emission sources. Please revise emission calculations, if applicable.**

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[1] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Policy Division, *PSD and Title V Permitting Guidance for Greenhouse Gases* (March 2011) at 48.

[2] 75 Fed. Reg. 31,520 (June 3, 2010).

RESPONSES TO INFORMATION REQUEST

Response from FHR

Emission units that are new, modified, and affected upstream or downstream were identified on Pages 5 and 6 of the application in the table called "West Refinery GHG Summary Table." The emission units listed in Item No. 2.A. of EPA's letter are not affected by the project. There are no physical changes or changes in method of operation proposed to these emission units, and they will not experience any increases in actual emissions as a result of the project. To help clarify, these emission units along with any other emission units on the process flow diagrams that are not affected by the project have been color coded purple to indicate they are not affected by the project. Revised process flow diagrams are included in Attachment B.

The Crude Charge Heater and Crude Vacuum Heater are two separate emission units that vent through a common stack. Therefore, the two heaters do have the same emission point designation of EPN A-103. There are no physical changes or changes in method of operation proposed to these emission units, and they will not experience any increases in actual emissions as a result of the project. These emission units have been color coded purple to indicate they are not affected by the project. A revised process flow diagram for the West Crude Unit is provided in Attachment B.

B. Page 19 of the permit application contains the process description for the Continuous Catalytic Regeneration/Naphtha Hydrotreater (CCR/NHT) Units. The process flow diagrams for these units are found on pages 94 and 95. It is not clear how the catalyst used in the process is regenerated from the description given and the process flow diagram. Please provide supplemental process data on the how "spent" catalyst is regenerated to "fresh" catalyst. The process diagram only shows catalyst feed into the CCR Unit. Is the catalyst regeneration process a potential GHG emitting source?

Response from FHR

A process description for the catalyst regeneration process is provided below. The CCR/TOL FRAC process flow diagram has also been revised to show the vent stream from the catalyst regeneration process (EPN JJ-5). There are no physical changes or changes in method of operation proposed to the catalyst regeneration process, and the regeneration process will not experience any increase in actual emissions as a result of the project. Therefore, GHG emissions from the catalyst regeneration vent are not pertinent to this application.

Catalyst is used to promote the reaction within the Continuous Catalytic Regeneration (CCR) Unit. The catalyst is continuously regenerated and circulated through the reactor section. Spent catalyst is continuously withdrawn from the fourth reactor bed and flows to the catalyst regeneration tower (shown as a box on the process flow diagram with the label "CCR"). The spent catalyst is continuously injected with perchloro-ethylene which promotes the reaction. Catalyst is regenerated in four steps: burning the coke, oxidizing/dispersing the metals and adjusting the chloride balance, drying excess moisture, and reducing oxygen from the metals. The regenerated catalyst is then returned to the first reactor bed. A vent gas scrubber treats the vent gas from regeneration and drying zone excess air in accordance with the Refinery MACT II, 40 CFR 63, Subpart UUU and vents it to atmosphere (EPN JJ-5).

RESPONSES TO INFORMATION REQUEST

C. **On page 30 of the application, it is stated that the Universal Dow Extraction (UDEX) Unit is an existing unit at the West Refinery, and the project will require installation of new equipment piping components. The UDEX fugitive emission source is not included on the UDEX process diagram on page 99 of the application. Please supplement the process flow diagram to include this emission source.**

Response from FHR

The UDEX fugitive emission source has been added to the UDEX/ARU process flow diagram. A revised process flow diagram for the UDEX/ARU unit is provided in Attachment B.

D. **On page 34 of the permit application, the process description for the Utilities Area states that the West Refinery consists of six boilers. There are no proposed physical changes or changes in method of operation to any of the boilers. However, as a result of the project, there will be an increase in steam demand so the boilers will experience an increase in actual emissions as a result of increased utilization. Because the boilers are affected (existing non-modified) emission units, these actual emissions are included in the PSD applicability assessment. The total emission increases from the six boilers are shown on page 9, line number 3 of Table 2F under one emission point identification number. Also, the process flow diagram on page 101 depicts these six boilers as one emission unit with one emission point identification number. Please provide supplemental information that verifies that these boilers vent to a common stack.**

Response from FHR

There are seven boilers potentially affected by the project. The six boilers in the utilities area and the Mid Plant Boiler. Any of these boilers could potentially see an increase in utilization as a result of the project, but the total incremental increase from all of the boilers will not be more than 96 MMBtu/hr as shown in the application. Therefore, the seven boilers have been grouped together into an emission source called "Various Boilers." EPA's question appears to concern pinpointing the location of the emissions from each stack. However, the location of each stack onsite does not affect this analysis. Each of the boilers has its own vent stack. The process flow diagram provided in the application is a general process flow diagram for a boiler rather than a process flow diagram for each individual boiler. A revised process flow diagram is provided in Attachment B, which explains that there are seven boilers potentially affected by the project that have been grouped together into an emissions source called "Various Boilers."

3. **On page 67 of the permit application, it states that FHR proposes for BACT the implementation of energy efficient design and operating practices for both the Sat Gas No. 3 and CCR Hot Oil Heaters. The BACT analysis does not appear to compare the selected heater design to other available heaters. Since efficient heater designs can vary among heaters, please provide supplemental data to the BACT analysis that explains if other heaters were evaluated for this project and why they were eliminated. If a more efficient design was evaluated and eliminated, please explain why. Also, please provide supplemental data that explains why the heaters selected are the most efficient for this source.**

RESPONSES TO INFORMATION REQUEST

Response from FHR

As described on pages 57 and 58 of the application, heaters for refinery applications of this scale tend to be custom-designed, developed specifically for the application in which they are to be put to use. As a result, there is not an available selection of off-the-shelf heaters from which to make a selection. Instead, the available and technically feasible energy efficiency measures are identified and designed into the heater. As we described in the application, this was the approach followed in developing the heater design for the proposed new heater. The same concepts were utilized to establish BACT for the existing, modified heater.

Since available and technically feasible efficiency measures were individually evaluated and integrated into the purpose-built designs proposed to be implemented as part of this project, "other heaters" were not evaluated and eliminated. Instead, the available technologies were evaluated and integrated into the design as described in the application. By integrating all of the available and technically feasible control strategies identified through the five-step process, the proposed designs will allow the heaters to operate as efficiently as possible consistent with BACT. Further details regarding the benchmarking data for new and existing sources, as well as the options considered are provided in response #4 and in Appendix B to the application.

4. **On page 68 of the permit application, the table that summarizes the proposed design and operating attributes to be put to use by the heaters includes, but is not limited to, the following:**

- **Install energy efficient burners,**
- **Combustion tuning and optimization,**
- **Draft/Trim instrumentation and controls,**
- **Reduce air leaks - 02 stack monitors will help identify leaks,**
- **Waste heat recovery, and**
- **Reduce slagging and fouling of heat transfer surfaces**

Please provide supplemental technical benchmark data that compares the design selections to be employed to a similar or existing source in the industry. If possible, please provide the technical resources used to evaluate the design decisions and to support the assertions made in this section. If technical benchmark data is not available, then please provide information detailing or projecting the potential efficiency gains that are expected utilizing these design strategies. Please include the basis for the rationale and supporting calculations and resources for this information.

Response from FHR

Details regarding the benchmarking data and available design selections were provided in Appendix B to the application. This appendix documented the resources utilized to evaluate potential efficiency gains, and summarized benchmarking data from other available resources to compare the heater attributes that were evaluated for integration into the new/modified heaters. As described above, since refinery heaters in this class are custom-designed, purpose built units, there is not an off-the-shelf selection of finished heater designs available for a direct benchmarking comparison.

RESPONSES TO INFORMATION REQUEST

Based on the references cited in the BACT analysis provided in the application, the following benchmarks of estimated ranges of efficiency improvement are available for the identified technology measures:

Technology Measure	Estimated Efficiency Improvement	Reference
Reduce Energy Loss by Minimizing Excess O2/Stack Flow (Combustion Air Controls- Limitations on Excess air)	1-3%	EPA white paper from October 2010 entitled "Available and Emerging Technologies for Reducing Greenhouse Gas Emission from the Petroleum Industry", page 12
Reduce Energy Loss by Minimizing Stack Temperature (Air preheat/heat recovery)	10-15%	EPA white paper from October 2010 entitled "Available and Emerging Technologies for Reducing Greenhouse Gas Emission from the Petroleum Industry", page 13
Reduce Conductive Heat Energy Loss (Improved Insulation)	3-13% (as described for boilers)	EPA white paper from October 2010 entitled "Available and Emerging Technologies for Reducing Greenhouse Gas Emission from the Petroleum Industry", page 13

5. **On page 47 of the permit application, increased GHG emissions are expected from planned maintenance, start up, and shutdown (MSS) activities associated with the construction of the new Sat Gas No. 3 Unit and for new storage tanks, which are not sources of GHG emissions during normal operations, but can emit GHGs during maintenance activities. The fugitive emissions from some MSS activities are routed to a control device which generates GHG emissions from combustion. The MSS activities and the control devices used for each activity is summarized below:**

Activity	Control Device Used
Vacuum Truck Loading	**Carbon Canister, Engine, Thermal Oxidizer**
Tank Degassing	**Engine, Thermal Oxidizer**
Tank Refilling after Degassing or Product Change	**Engine, Thermal Oxidizer**

A. **It is indicated that GHG emissions are expected from MSS activities associated with the construction of the new Sat Gas No. 3 and for "new" storage tanks. On page 40 of the application it is stated that storage tanks 08FB137, 08FB142, 08FB147, 40FB4010, 40FB4011 are "existing" sources at the West Refinery and there are "no" proposed physical changes or changes in method of operation for the storage tanks. However, as a result of the project, the tanks will experience an increase in actual emissions as a result of increased crude oil throughout. Because of this, the storage tanks are an affected (existing non-modified) source and the**

changes in actual emissions have been included in the PSD applicability assessment. The table on page 5 and 6 entitled "West Refinery GHG Summary Table" does not identify "new" storage tanks to be constructed for this project. It is not clear which equipment emissions, due to MSS activities, will be directed to the control devices stated in the application. Please provide supplemental information that verifies the new or modified equipment emissions that will be directed to the control devices. Please include information pertaining to the "new" storage tanks that are referenced on page 47. Will the CCR Hot Oil Heater emissions from MSS Activities be directed to a control device?

Response from FHR

As described on Page 47 of the application, increased GHG emissions are expected from planned maintenance, startup, and shutdown (MSS) activities associated with the construction of the new Sat Gas No. 3 Unit and for new storage tanks, which are not sources of GHG emissions during normal operations, but can emit GHGs during maintenance activities.

FHR is proposing to construct two new storage tanks (IFRTK1 and IFRTK2) as part of the domestic crude project. During normal operation, these new storage tanks will only store materials that do not have the potential for greenhouse gas emissions. During routine maintenance on the tanks such as product changes or degassing, emissions generated by these maintenance activities will be routed to a control device such as an engine. The combustion of the vent gases generated during the maintenance on these tanks will generate GHG emissions. Therefore, FHR has included the greenhouse emissions generated during routine maintenance on the new tanks in the application.

Tanks 08FB137, 08FB142, 08FB147, 40FB4010, and 40FB4011 are existing tanks at the West Refinery that store crude oil. These tanks will experience an incremental increase in crude oil throughput as a result of the project, and crude oil is a material with the potential for GHG emissions. Therefore, these existing tanks are included as downstream affected sources. MSS emissions from these existing tanks are already permitted, and there are no changes proposed to the MSS emissions from these tanks.

Vacuum trucks are used to transfer materials from one container to another and to empty tanks and other vessels during maintenance activities. Vacuum trucks are also used for blinding activities, pump maintenance, and dewatering crude tanks etc. Vacuum truck emissions will be controlled by a carbon canister system, an engine, or a thermal oxidizer. Because the new Saturates Gas Plant No. 3 process unit is being built, there is the potential for more vacuum trucks being utilized than were authorized by the TCEQ in NSR Permit No. 8803A in July 2009. Accordingly, FHR has included the increased GHG emissions from these vacuum trucks in the application.

The combustion of the vent gases generated during the maintenance associated with the additional vacuum truck loadings and the new storage tanks will generate greenhouse gas emissions. Therefore, FHR has included the GHG emissions associated with the control of these maintenance activities in the application.

The CCR Hot Oil Heater will not have emissions from MSS activities directed to a control device.

RESPONSES TO INFORMATION REQUEST

B. On page 83 of the application, it is stated in the BACT analysis for MSS that the GHG emissions from MSS emissions are the result of maintaining new process vessels and other new equipment. The emissions are dominated by C02e emissions from degassing to a control device for VOC and GHG control. The description provided in the table on page 83 indicates that to minimize degassing emissions, liquids will first be pumped to recovery and then the vessel will be depressured and purged to a "flare or flare gas recovery unit." It was previously indicated on page 47 that the control devices utilized for MSS activities consisted of carbon canister, engine and thermal oxidizer. Will the emissions from the MSS activities also be routed to a flare or flare gas recovery unit as well as a carbon canister, engine and thermal oxidizer? Please explain the inconsistency. If a flare or flare gas recovery unit is being used, is it a new, modified or affected (existing non-modified) flare or flare gas recovery unit? If it is a new construction or modified, please provide supplemental technical information for the flare that includes: the destruction and removal efficiency (DRE), how will the flare be controlled to minimize GHG emissions, and what is the proposed compliance strategy for the flare.

Response from FHR

A table is provided below that describes the different MSS activities in the application. The Flare Gas Recovery Unit (FGRU) at the West Refinery is an existing unit. The only potential for emissions from the flare system is in the rare occasion the capacity of the FGRU is exceeded, and vent gas is routed to the flare system. In this case, these emissions are considered upset emissions and are not authorized emissions. The flare system is currently authorized for 300 hours/yr of MSS emissions in case the FGRU has to be shutdown for maintenance. FHR is not proposing any changes to the MSS emissions already authorized. Therefore, the FGRU and the associated flare system is not modified or affected by the domestic crude project.

RESPONSES TO INFORMATION REQUEST

MSS Activity	Equipment Associated with MSS Activity	Control Device for MSS Activity	Source of GHG Emissions for MSS Activity
Opening process equipment to atmosphere after being purged and degassed during a unit shutdown	Process equipment associated with new Saturates Gas Plant No. 3 Unit	Equipment is purged and degassed to the existing Flare Gas Recovery Unit prior to being opened to atmosphere.	Residual methane emissions after process equipment associated with new Saturates Gas Plant No. 3 Unit is purged and degassed.
Vacuum Trucks	Vacuum Trucks used during the shutdown and maintenance of the new Saturates Gas Plant No. 3 Unit	Carbon Canister, Engine, Thermal Oxidizer	Combustion emissions from controlling emission generated during vacuum truck loading associated with the shutdown and maintenance of the new Saturates Gas Plant No. 3 Unit
Tank Degassing	Two new storage tanks (IFRTK1 and IFRTK2)	Engine, Thermal Oxidizer	Combustion emissions from controlling emission generated during degassing of two new storage tanks
Tank Refilling after Degassing or Product Change	Two new storage tanks (IFRTK1 and IFRTK2)	Engine, Thermal Oxidizer	Combustion emissions from controlling emission generated during refilling of two new storage tanks

ATTACHMENT A

Additional Impacts Analysis

ADDITIONAL IMPACTS ANALYSIS

Growth

The proposed project will occur at the existing West Refinery, and there is no additional property being purchased to accommodate this project. In addition, there are no new businesses directly associated with the project. Therefore, FHR is not expecting any industrial or commercial growth. Approximately 1000 new temporary jobs and 50 permanent jobs are expected from the project. The temporary jobs will not have an impact on residential growth and the 50 permanent jobs are not expected to have an impact on general residential growth as well. Because no general industrial, commercial, or residential growth is expected from the construction of the domestic crude project, it is anticipated that there will be no growth-related air pollution impact.

Soil and Vegetation

The proposed project will occur at the existing West Refinery, and there is no additional property being purchased to accommodate this project. As explained in Section 3.0 of FHR's permit application, this project—including construction of the new emission units, changes to existing emission units, and emissions increases from upstream and downstream affected units—will not trigger federal PSD for any non-GHG new source review (NSR)-regulated pollutants. In fact, the overall project will result in decreased emissions of non-GHG NSR-regulated pollutants.

Air dispersion modeling was conducted for the proposed Project according to the requirements of the Texas Commission on Environmental Quality (TCEQ) (see guidance at: http://www.tceq.texas.gov/permitting/air/nav/modeling_index.html) for non-GHG air pollutants. The TCEQ minor NSR air quality modeling protocols require that increases and decreases in allowable emissions associated with a proposed project be modeled for potential impacts. Modeling results for NO2, CO, SO2, PM10, and PM2.5 indicate that all modeled air concentrations are below the respective SILs within and beyond the facility property boundary. SILs may be used to determine whether emission increases from a proposed project will have any more than de minimis impacts on the consumption of PSD increments or attainment and maintenance of a NAAQS. Modeled emissions impacts below the respective SIL can be interpreted to mean that project emissions will also have an insignificant impact on soils and vegetation per the USEPA definition and use of a SIL. These modeling results indicate that estimated emissions from the project have insignificant impacts to air quality, soils, and vegetation according to USEPA policies regarding SILs, even within the facility property boundary.

In addition to air dispersion modeling for criteria pollutants, FHR also conducted modeling for speciated VOC emissions, particulate metal emissions, ammonia, and polycyclic aromatic hydrocarbon (PAH) emissions associated with the Project. FHR compared those modeling results to TCEQ's acute and chronic ESLs. ESLs are screening levels used in TCEQ's air permitting process to evaluate air dispersion modeling's predicted impacts. They are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. ESLs are based on data concerning health effects, the potential for odors to be a nuisance, and effects on vegetation. They are not ambient air standards. If predicted airborne levels of a constituent do not exceed the screening level, adverse health or welfare effects are not expected. If predicted ambient levels of constituents in air exceed the screening levels, it does not necessarily indicate a problem but rather triggers a review in more depth.

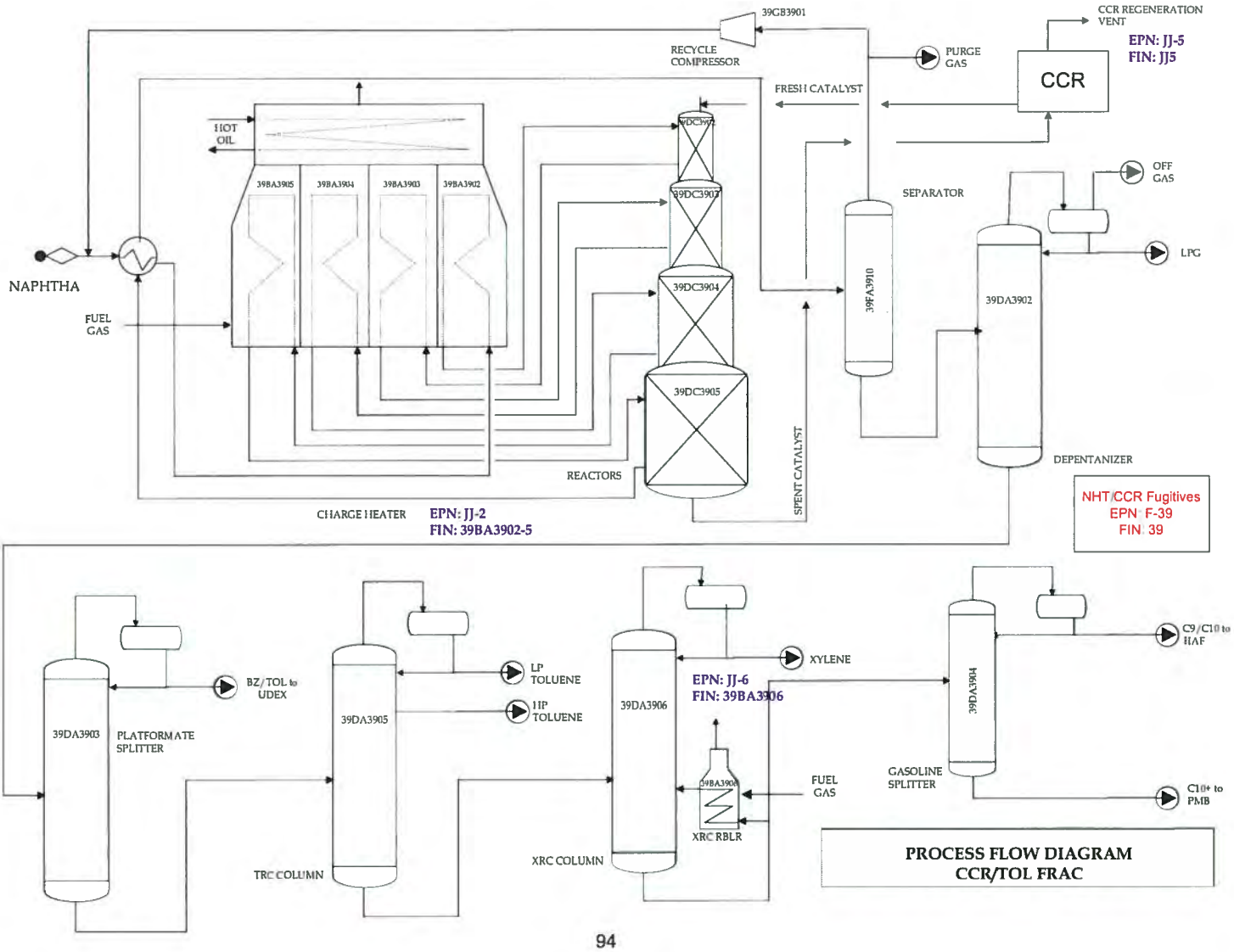
None of the maximum modeled acute (1-hour) or chronic (annual) air concentrations exceed the respective ESLs within or outside of the property boundary. This provides additional support that the proposed project will have insignificant impacts to air quality, soils, and vegetation.

Visibility Analysis

As explained in Section 3.0 of FHR's permit application, this project—including construction of the new emission units, changes to existing emission units and emissions increases from upstream and downstream affected units—will not trigger federal PSD for any non-GHG NSR-regulated pollutants. In fact, the overall project will result in decreased emissions of non-GHG NSR-regulated pollutants. Therefore, visibility in the vicinity of the site is not expected to be impacted by the proposed domestic crude project. The nearest Class I area is Big Bend National Park, over 470 km away; therefore, no adverse impacts are expected in there. An additional Class II area visibility analysis is not required since the sources are expected to comply with the applicable visibility and opacity requirements in 30 TAC Chapter 111.

ATTACHMENT B

Revised Process Flow Diagrams


39GB3901
RECYCLE COMPRESSOR
CCR REGENERATION VENT
EPN: JJ-5
FIN: JJ5
PURGE GAS
CCR
FRESH CATALYST
HOT OIL
39BA3905
39BA3904
39BA3903
39BA3902
39DC3907
39DC3906
39DC3904
39DC3905
SEPARATOR
39FA3910
OFF GAS
LPG
39DA3902
NAPHTHA
FUEL GAS
REACTORS
SPENT CATALYST
DEPENTANIZER
CHARGE HEATER
EPN: JJ-2
FIN: 39BA3902-5
NHT/CCR Fugitives
EPN: F-39
FIN: 39
39DA3903
PLATFORMATE SPLITTER
BZ/TOL to UDEX
39DA3905
LP TOLUENE
HP TOLUENE
TRC COLUMN
39DA3906
XYLENE
EPN: JJ-6
FIN: 39BA3906
39BA3908
XRC RBLR
XRC COLUMN
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GASOLINE SPLITTER
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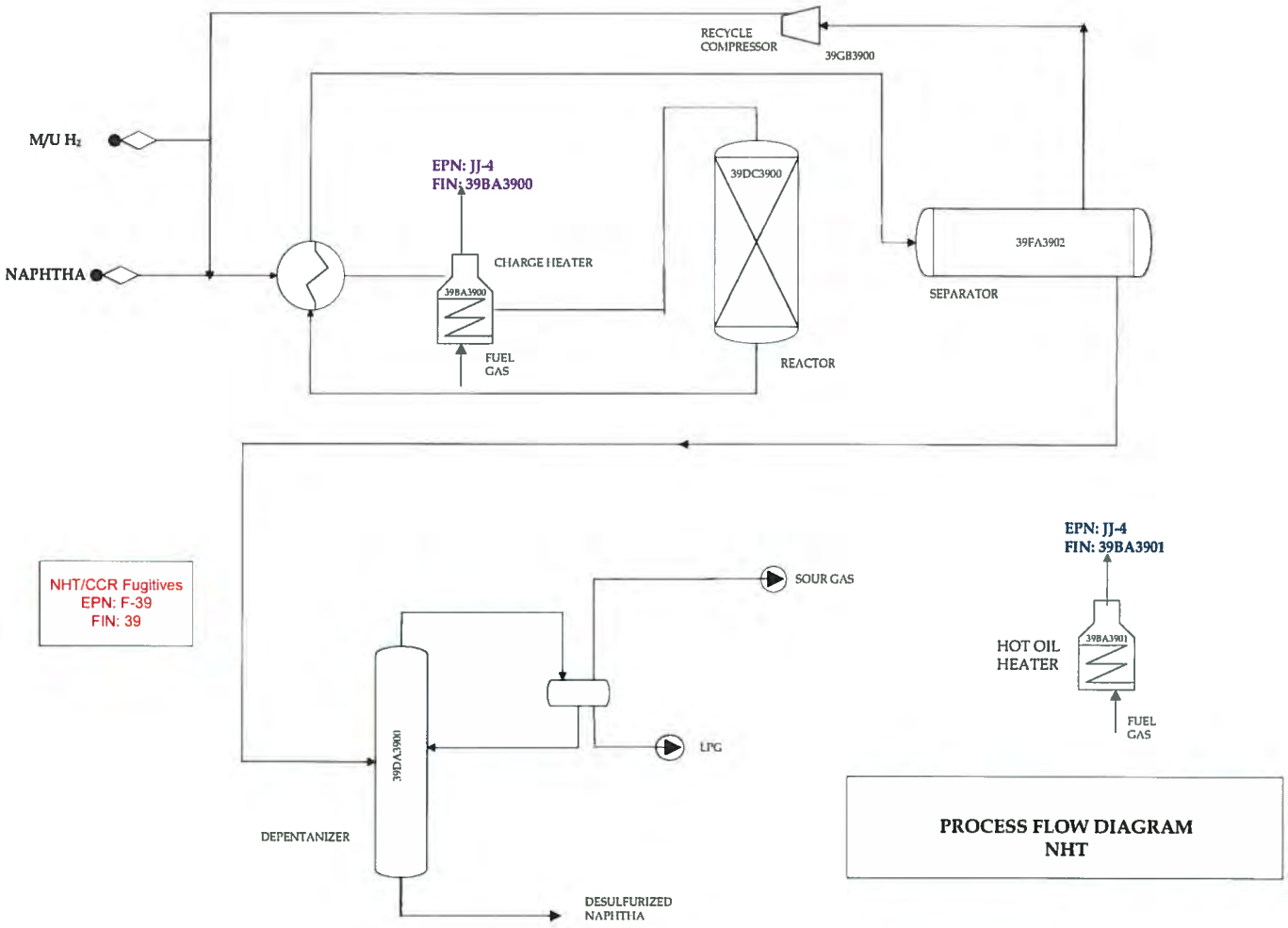
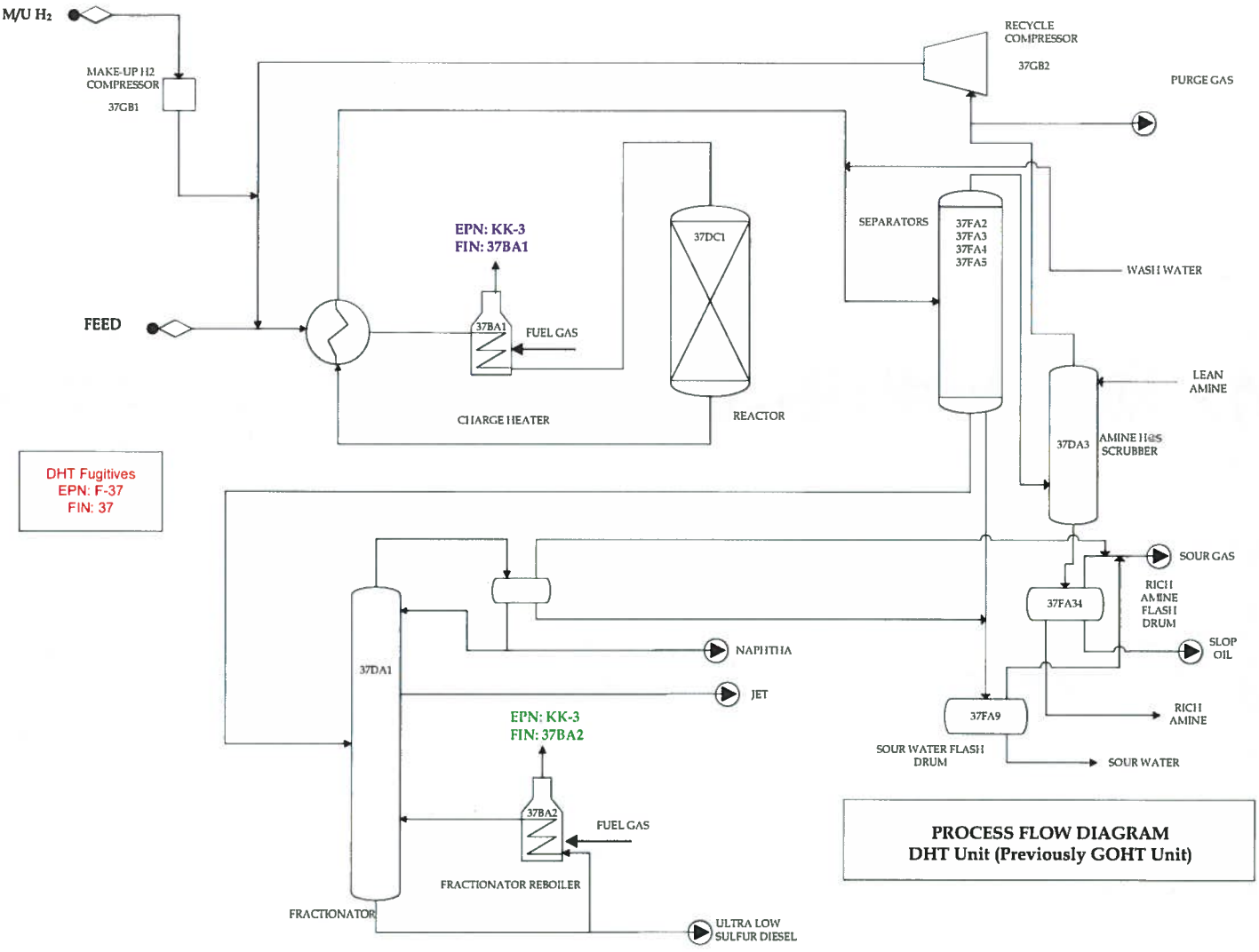
C10+ to PMB
PROCESS FLOW DIAGRAM
CCR/TOL FRAC



PROCESS FLOW DIAGRAM
NHT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RECYCLE COMPRESSOR
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PURGE GAS
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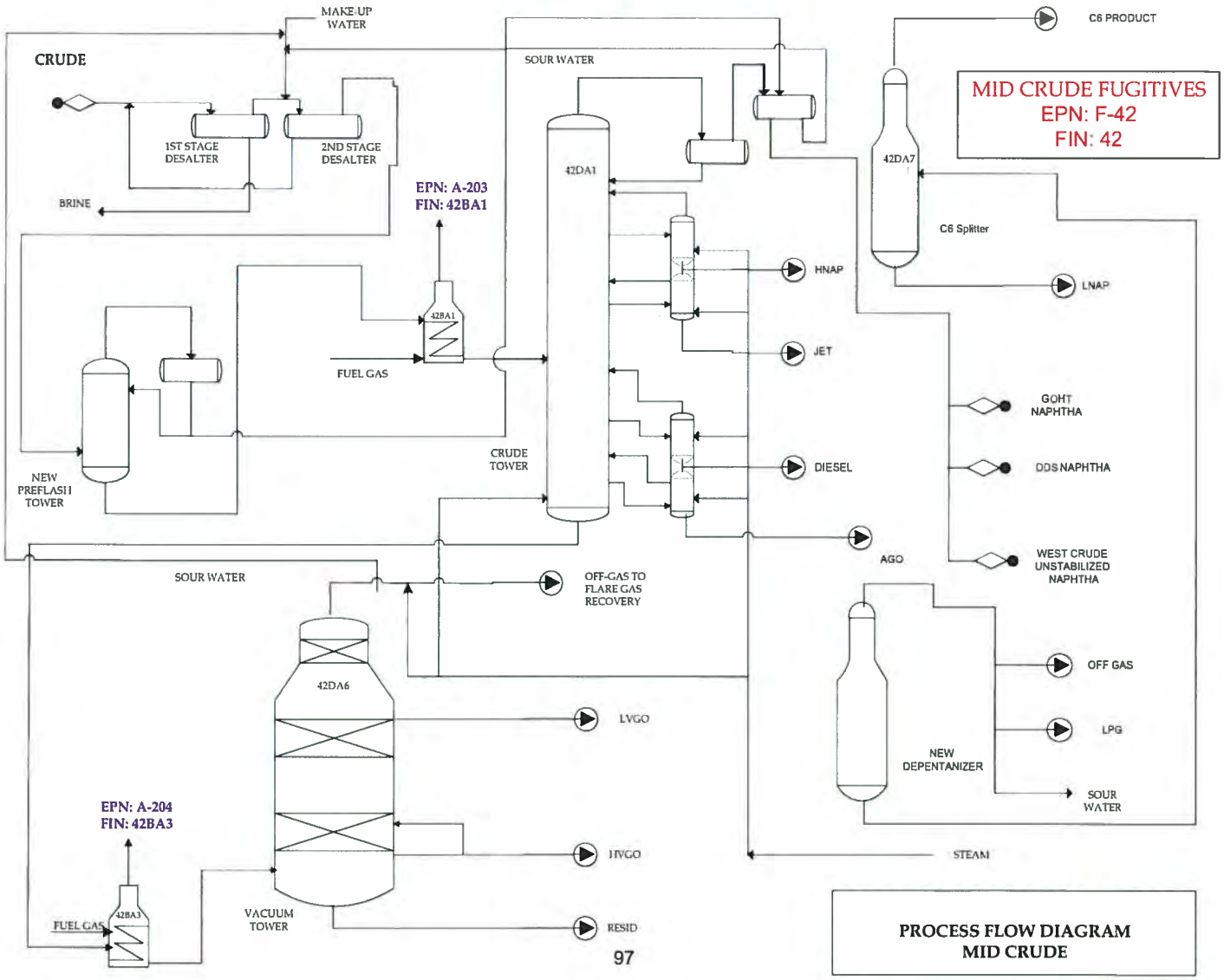
SEPARATORS
37FA2
37FA3
37FA4
37FA5
WASH WATER
FEED
37BA1
FUEL GAS
CHARGE HEATER
REACTOR
LEAN AMINE
37DA3
AMINE H2S SCRUBBER
DHT Fugitives
EPN: F-37
FIN: 37
SOUR GAS
RICH AMINE FLASH DRUM
37FA34
NAPHTHA
SLOP OIL
37DA1
JET
EPN: KK-3
FIN: 37BA2
37FA9
RICH AMINE
SOUR WATER FLASH DRUM
SOUR WATER
37BA2
FUEL GAS
FRACTIONATOR REBOILER
FRACTIONATOR
ULTRA LOW SULFUR DIESEL
PROCESS FLOW DIAGRAM
DHT Unit (Previously GOHT Unit)


MAKE-UP WATER
CRUDE
SOUR WATER
C6 PRODUCT
MID CRUDE FUGITIVES
EPN: F-42
FIN: 42
1ST STAGE DESALTER
2ND STAGE DESALTER
BRINE
EPN: A-203
FIN: 42BA1
42DA1
42DA7
C6 Splitter
HNAP
LNAP
JET
42BA1
FUEL GAS
GOHT NAPHTHA
DDS NAPHTHA
NEW PREFLASH TOWER
CRUDE TOWER
DIESEL
AGO
WEST CRUDE UNSTABILIZED NAPHTHA
SOUR WATER
OFF-GAS TO FLARE GAS RECOVERY
42DA6
OFF GAS
LPG
LVGO
NEW DEPENTANIZER
SOUR WATER
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HVGO
STEAM
FUEL GAS
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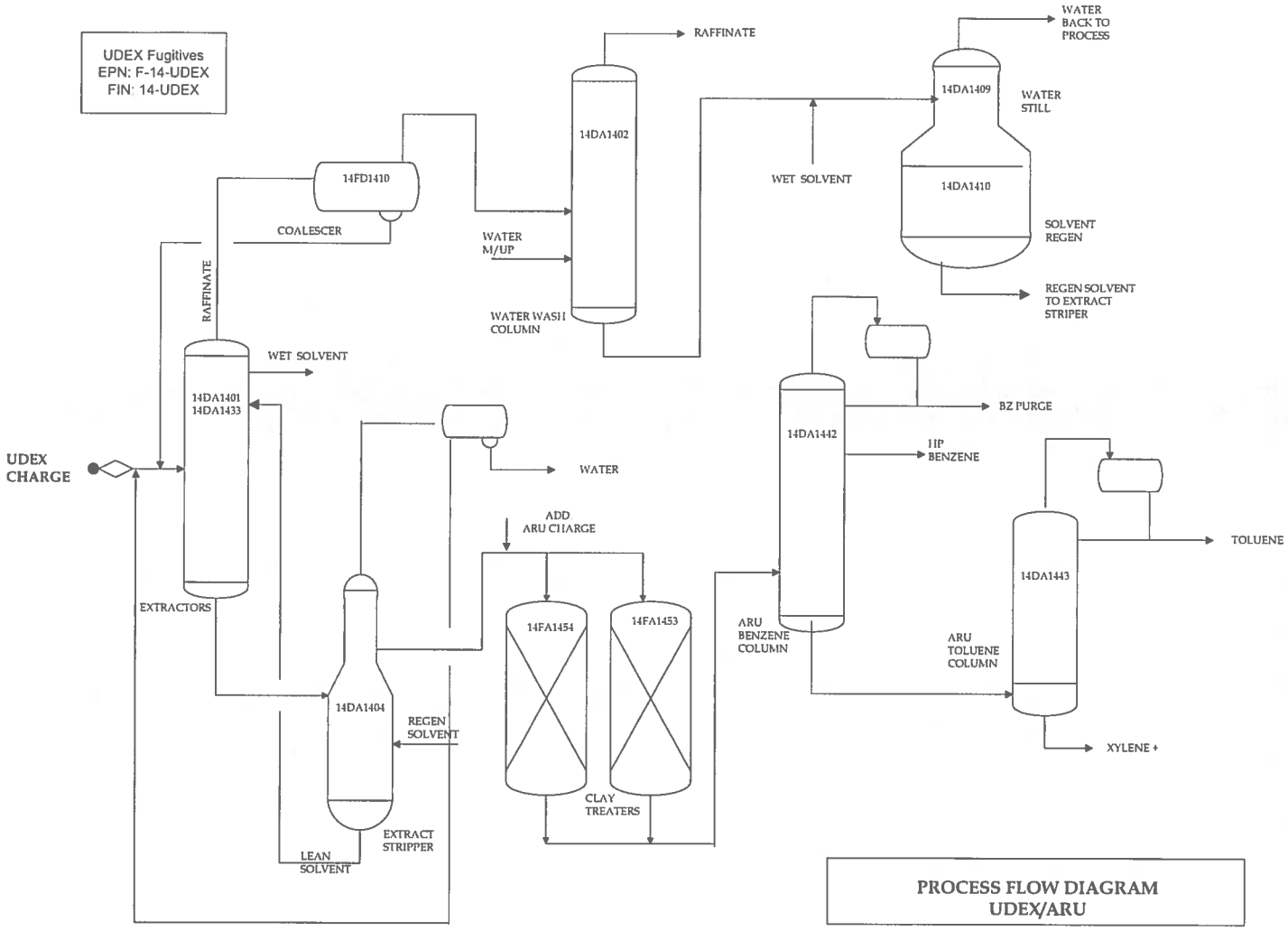
VACUUM TOWER
RESID
PROCESS FLOW DIAGRAM
MID CRUDE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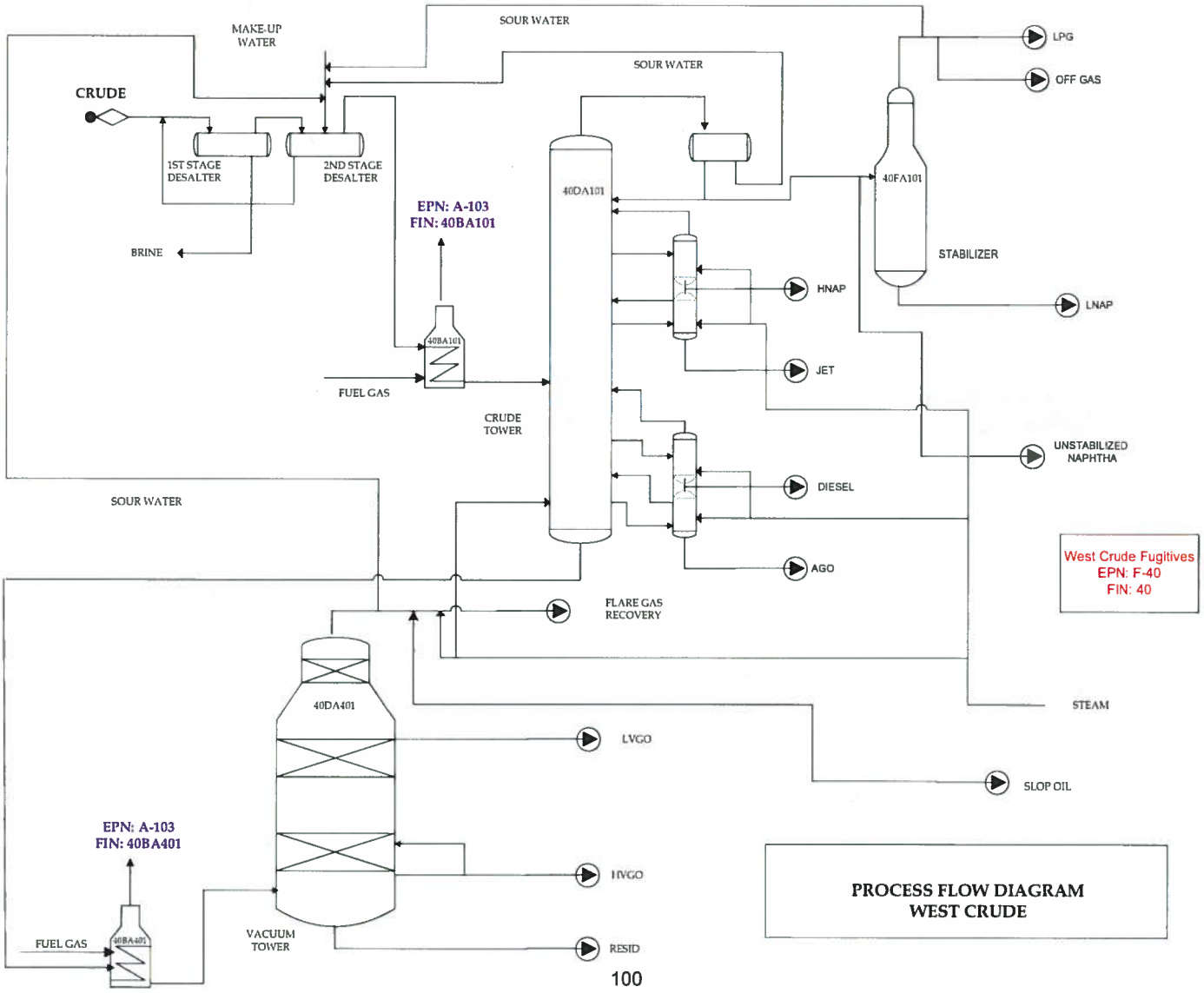
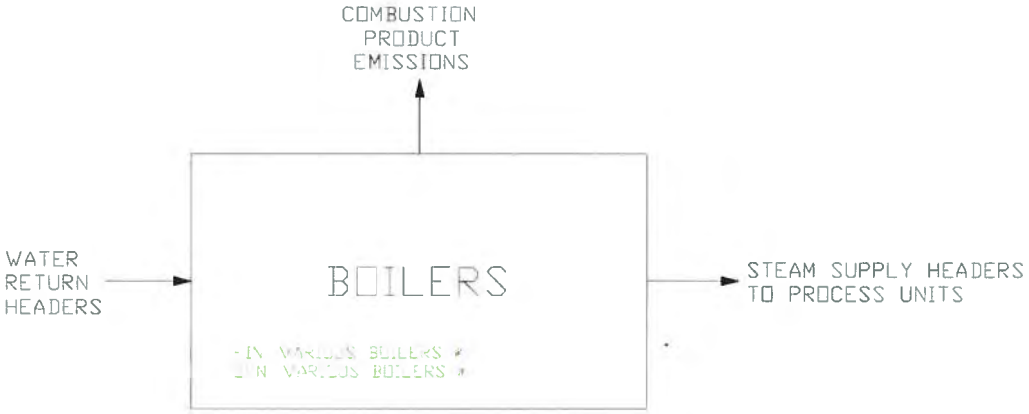
EPN: F-14-UDEX
FIN: 14-UDEX
RAFFINATE
WATER BACK TO PROCESS
14DA1409
WATER STILL
14DA1402
14FD1410
WET SOLVENT
14DA1410
SOLVENT REGEN
COALESCER
WATER M/UP
REGEN SOLVENT TO EXTRACT STRIPER
WATER WASH COLUMN
RAFFINATE
WET SOLVENT
14DA1401
14DA1433
BZ PURGE
14DA1442
UDEX CHARGE
WATER
HP BENZENE
ADD ARU CHARGE
TOLUENE
14DA1443
EXTRACTORS
14FA1454
14FA1453
ARU BENZENE COLUMN
ARU TOLUENE COLUMN
14DA1404
REGEN SOLVENT
XYLENE +
CLAY TREATERS
EXTRACT STRIPPER
LEAN SOLVENT
PROCESS FLOW DIAGRAM
UDEX/ARU


MAKE-UP WATER
SOUR WATER
SOUR WATER
CRUDE
LPG
OFF GAS
1ST STAGE DESALTER
2ND STAGE DESALTER
40DA101
40FA101
EPN: A-103
FIN: 40BA101
BRINE
STABILIZER
HNAP
LNAP
40BA101
JET
FUEL GAS
CRUDE TOWER
UNSTABILIZED NAPHTHA
SOUR WATER
DIESEL
AGO
FLARE GAS RECOVERY
40DA401
STEAM
LVGO
SLOP OIL
EPN: A-103
FIN: 40BA401
HVGO
FUEL GAS
40BA401
VACUUM TOWER
RESID
West Crude Fugitives
EPN: F-40
FIN: 40
PROCESS FLOW DIAGRAM
WEST CRUDE



There are seven boilers potentially affected by the project. The six boilers in the utilities area and the No Plant Boiler. Any of these boilers could potentially see an increase in utilization as a result of the project. Therefore, the seven boilers have been grouped together into an emission source called Various Boilers. Each of the boilers has their own vent stack.

WAID ENVIRONMENTAL

FLINT HILLS RESOURCES CORPUS CHRISTI, LLC

BOILERS PROCESS W. REFINERY CC,TX.

DWW	7/9/08	5/2/13	BOILERS	3

H:\CLIENTS\FLINTHILL WEST\KRWB40\WP\CONFTABLET2\EHC APPL PFD