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Biological Assessment
for the
Frac-3 and Frac-4 Expansion Project
at the
Mont Belvieu Natural Gas Liquids
Fractionation Facility



ONEOK Hydrocarbon, L.P.

Project No. 75471

February 2014

**Biological Assessment
for the Frac-3 and Frac-4
Expansion Project at the
Mont Belvieu Natural Gas Liquids
Fractionation Facility**

prepared for

**ONEOK Hydrocarbon, L.P.
Tulsa, Oklahoma**

February 2014

Project No. 75471

prepared by

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EXECUTIVE SUMMARY

ONEOK Hydrocarbon, L.P. (“OHLP”) proposes to construct an expansion of its Natural Gas Liquids Fractionation Facility in Mont Belvieu, Chambers County, Texas. The facility to be constructed (the “Facility” or “Frac-3 and Frac-4 Facility”) would consist of additional natural gas liquids fractionation trains and be constructed adjacent to the currently operating MB-2 (Frac-1) facility and the permitted MB3 (Frac-2) Facility, which is currently under construction. The proposed Frac-3 and Frac-4 Facility will require a Prevention of Significant Deterioration (“PSD”) permit from the U.S. Environmental Protection Agency (“EPA”) for greenhouse gas emissions. As the PSD permit constitutes a federal action, it requires compliance with Section 7 of the Endangered Species Act (“ESA”). To satisfy the requirements of Section 7, a biological assessment is conducted to evaluate potential impacts to species with federal oversight (i.e., those species protected under the ESA). On behalf of OHLP, Burns and McDonnell Engineering Company, Inc. (“Burns & McDonnell”) prepared this biological assessment to evaluate potential project-related impacts to federally protected species that are known or likely to occur in the vicinity of the project. The biological assessment was conducted in accordance with Section 7 of the ESA.

According to the U.S. Fish and Wildlife Service (“FWS”), National Marine Fisheries Service (“NMFS”), and the Texas Parks and Wildlife Department (“TPWD”), the federally protected green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, Louisiana black bear, piping plover, red wolf, and smalltooth sawfish are known or likely to occur within Chambers County. One additional species, Sprague’s pipit, is a federal candidate species that may occur in Chambers County, according to TPWD; however, it is not currently recognized in Chambers County by FWS. In addition, at the request of the EPA, the whooping crane, which is federally listed as endangered and winters in marshes along the Gulf Coast of Texas, was also evaluated.

The geographic area considered in this biological assessment, referred to as the Action Area, was determined by identifying the maximum area in which direct or indirect impacts may result from air contaminant emissions from operation of the proposed Frac-3 and Frac-4 Facility. The Action Area for this biological assessment was defined based upon the greatest radius at which modeled concentrations were higher than a Significant Impact Level (“SIL”) for primary or secondary National Ambient Air Quality Standards (“NAAQS”) for carbon monoxide (“CO”), nitrogen dioxide (“NO₂”), sulfur dioxide (“SO₂”), or particulate matter (“PM₁₀”) and fine particulate matter (“PM_{2.5}”). The air dispersion modeling analysis predicted Facility impacts would only be higher than the 8-hour CO, 1-hour NO₂, Annual NO₂, 24-hour PM₁₀, Annual PM₁₀, 24-hour PM_{2.5}, Annual PM_{2.5}, 1-hour SO₂, and 24-hour SO₂ SILs and that

the boundary of the Action Area extends 4.47 km (2.78 miles) out from the sources of air emissions from the Facility. Emissions of non-criteria pollutants from the proposed Frac-3 and Frac-4 Facility were also modeled. Modeling indicated no off-property impacts to listed or proposed species and/or designated or proposed critical habitat (henceforth, referred to as “Protected Resources”) would result from non-criteria pollutants emitted during construction and operation of the proposed Frac-3 and Frac-4 Facility.

From December 9 through 11, 2013, a biologist from Burns & McDonnell completed a field survey of the Action Area to determine the presence of suitable habitat for protected or sensitive species and evaluate the potential impacts that could result from construction and operation of the proposed Frac-3 and Frac-4 Facility. The results of the field survey indicate that the proposed Frac-3 and Frac-4 Facility, which is located on a previously disturbed and developed parcel of property in the City of Mont Belvieu, would not result in the loss of habitat, fragmentation of habitat, or increased predation of any federally protected species. Considering the scope of the proposed Project, the relatively developed nature of the area within the City of Mont Belvieu where the proposed Frac-3 and Frac-4 Facility will be located, the lack of potential protected species habitat at the proposed Frac-3 and Frac-4 Facility site and within the Action Area, and the level of emissions that would result from operation of the proposed Frac-3 and Frac-4 Facility, it was determined that the proposed Frac-3 and Frac-4 Facility would have “no effect” on the green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, Louisiana black bear, piping plover, red wolf, smalltooth sawfish, and whooping crane (Table E-1).

Table E-1 Effects on Protected Species Known or Likely to Occur within Chambers County

Common Name	Scientific Name	Federal Status	Critical Habitat Designated in Chambers County	Effect Determination
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened	No	No Effect
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered	No	No Effect
Kemp’s Ridley Sea Turtle	<i>Lepidochelys kempii</i>	Endangered	No	No Effect
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	No	No Effect
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Threatened	No	No Effect
Louisiana Black Bear	<i>Ursus americanus luteolus</i>	Threatened	No	No Effect
Piping Plover	<i>Charadrius melodus</i>	Threatened	No	No Effect
Red Wolf	<i>Canis rufus</i>	Endangered	No	No Effect
Smalltooth Sawfish	<i>Pristis pectinata</i>	Endangered	No	No Effect
Whooping Crane	<i>Grus americana</i>	Endangered	No	No Effect

1.0 INTRODUCTION

ONEOK Hydrocarbon, L.P. (“OHLP”) proposes to construct an expansion of its Natural Gas Liquids Fractionation Facility in Mont Belvieu, Chambers County, Texas (Figure 1, Appendix A). The facility to be constructed (the “Facility” or “Frac-3 and Frac-4 Facility”) would consist of new fractionation trains, and would be located adjacent to existing natural gas liquids storage caverns and on the same site as the previously-permitted fractionation plant (MB2 and MB3 Facility or Frac-1 and Frac-2), for which initial and currently ongoing construction commenced during the second quarter of 2011. The proposed Frac-3 and Frac-4 Facility requires a Prevention of Significant Deterioration (“PSD”) permit from the U.S. Environmental Protection Agency (“EPA”) for greenhouse gas emissions. As the PSD permit constitutes a federal action, it requires compliance with Section 7 of the Endangered Species Act. To satisfy the requirements of Section 7, a biological assessment was conducted to evaluate potential impacts to species with federal oversight (i.e., those species protected under the Endangered Species Act). Accordingly, this biological assessment evaluates potential project-related impacts to the federally protected species known or likely to occur in Chambers County.

1.1 APPLICABLE REGULATIONS

EPA’s review of a PSD permit application requires compliance with Section 7 of the federal Endangered Species Act. Under the Endangered Species Act, EPA may consult with the FWS and NMFS to determine if the proposed Frac-3 and Frac-4 Facility authorized by an EPA-issued PSD permit would possibly jeopardize the continued existence of protected resources under the Endangered Species Act.

1.1.1 Clean Air Act

The federal Clean Air Act and its implementing regulations define the minimum standards that must be maintained to protect public health and the environment. The National Ambient Air Quality Standards (“NAAQS”) for criteria pollutants are EPA-established levels of air quality applicable throughout the United States. Primary NAAQS standards define the level of air quality necessary to prevent any adverse impact on human health, and are set at levels to protect the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary NAAQS standards define the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant, and are set at levels to protect against decreased visibility and damage to animals, crops, vegetation, and buildings. A PSD permit must be obtained prior to construction of a new emissions source or major modification of an existing major source that exceeds specified criteria pollutant thresholds in an area that is in compliance with the NAAQS. To receive a PSD permit, the applicant must demonstrate that the proposed new or modified source would not have an unacceptable impact on ambient air quality.

1.1.2 Endangered Species Act

The purpose of the Endangered Species Act (“ESA”) (16 U.S.C. 1531-1544, 87 Stat. 884), as amended, is to protect and recover imperiled species and the ecosystems upon which they depend. The ESA is administered by the FWS and the NMFS and protects endangered and threatened species and their critical habitats by prohibiting the “take” of listed animals. The ESA defines “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (http://www.fws.gov/endangered/esa-library/pdf/ESA_basics.pdf).

Under 50 C.F.R. § 402.14, a Federal agency shall review its actions at the earliest possible time to determine whether any action may affect protected resources. If such a determination is made, formal consultation with FWS and/or NMFS is required, except if, as a result of the preparation of a biological assessment under 50 C.F.R. § 402.12, the Federal agency determines that the proposed action is not likely to adversely affect any protected resources.

1.1.3 Bald and Gold Eagle Protection Act

Although the bald eagle is no longer listed under the Endangered Species Act, it continues to be protected by the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250), as amended. The Bald and Golden Eagle Protection Act is administered by the U.S. Fish and Wildlife Service and prohibits, except under certain specified conditions, the “take” of the bald eagle and the golden eagle. The Bald and Golden Eagle Protection Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, disturb, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any Golden Eagle], alive or dead, or any part, nest, or egg thereof” (<http://www.fws.gov/midwest/Eagle/guidelines/bgepa.html>).

1.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755), as amended, carries out the United States’ commitment to protect birds (including bald eagles) that migrate across international borders. The Migratory Bird Treaty Act, which is administered by the U.S. Fish and Wildlife Service, prohibits the “take” of migratory birds, their eggs, parts, and nests, except as authorized under a valid permit. The Migratory Bird Treaty Act defines “take” as “pursue, hunt, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention ... for the

protection of migratory birds ... or any part, nest, or egg of any such bird"

(<http://www.fws.gov/laws/lawsdigest/migtrea.html>).

1.1.5 Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (16 U.S.C.; Ch. 31) is administered by the National Marine Fisheries Service and prohibits, with certain exceptions, the "take" of all marine mammals in U.S. waters. The Marine Mammal Protection Act defines "take" as "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect" (<http://www.nmfs.noaa.gov/pr/pdfs/laws/mmpa.pdf>).

1.1.6 Magnuson-Stevens Reauthorization Act

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 is administered by the National Marine Fisheries Service and protects essential fish habitat used by the Atlantic's highly migratory species (http://www.nmfs.noaa.gov/msa2005/docs/MSA_amended_msa%20_20070112_FINAL.pdf). The Atlantic's highly migratory species include anadromous fish populations that are managed by the National Marine Fisheries Service's Office of Sustainable Fisheries and may inhabit coastal rivers, estuaries, and bays.

1.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed project will consist of constructing and operating the Frac-3 and Frac-4 Facility, which includes fractionation trains for natural gas liquids. Each fractionation train would have a nominal design basis of approximately 75,000 barrels per day ("bpd") and a maximum potential operations basis of 115,000 bpd processing capacity.

The proposed Frac-3 and Frac-4 Facility would be constructed and operated by OHLP. The Frac-3 and Frac-4 Facility footprint is approximately 77 acres in size and would be located at 1802 North Main Street in Mont Belvieu, Chambers County, Texas (Figure 1, Appendix A). The site is near the intersection of State Highways 146 and 207 (Figures 2 and 3, Appendix A). The site is located in a previously disturbed area (existing laydown area and contractor parking lot for the MB3 project) adjacent to existing natural gas liquids storage caverns and on the same site as the previously-permitted MB2 and MB3 Facility, for which ongoing construction commenced during the second quarter of 2011 (Figure 3, Appendix A). Construction of the proposed Frac-3 and Frac-4 Facility is anticipated to begin in the first quarter of 2015 with operations planned to begin in the first quarter of 2017.

Construction equipment will access the site from North Main Street, State Highway 146, Fitzgerald Road, and Winfree Street. During operation, vehicles will access the proposed Frac-3 and Frac-4 Facility from an entrance road constructed off of Fitzgerald Road.

1.2.1 Noise

Construction-related noise will be localized and short-term, and stem from construction equipment operation, including but not limited to truck traffic, earth-moving vehicles and equipment, jackhammers, and structure erection equipment (cranes), etc. Construction activities and noise generation will typically occur during the daytime (between 7:00 a.m. to 7:00 p.m.). Overall, these sound levels are typical of construction projects and generally result in minor short-term increases in ambient noise levels in the immediate vicinity of work sites.

Noise levels during operation of the Frac-3 and Frac-4 Facility will be comparable to noise levels of the existing petrochemical facilities in the area and are not anticipated to result in off-property noise related nuisances.

1.2.2 Waste Water Quantity and Quality

The Frac-3 and Frac-4 Facility will produce both process and non-process wastewater. Process water that directly contacts natural gas liquids, finished product, amine, and other process chemicals will be contained and disposed off-site. Only non-process wastewater will be discharged through EPA- and Railroad Commission of Texas (“RRC”)-administered National Pollutant Discharge Elimination System (“NPDES”) Permit TX0140091. A NPDES permit amendment for the Frac-3 and Frac-4 Facility will be submitted in the first quarter of 2014. The primary sources of non-process wastewater will be water treatment residuals, cooling tower blow-down, firewater, hydrotest, and storm water. The quantity and quality of non-process wastewater that will directly enter the environment are described in the following paragraphs.

Approximately 4,000 gallons per minute of raw water will be required to operate the Facility. Raw water will be supplied from the Cedar Point Lateral of the Coastal Water Authority Canal (as identified on the USGS 7.5' Mont Belvieu, Texas Quadrangle, 1994 and the 7.5' Sheeks, Texas Quadrangle, 1993; Figure 2). Water for the Frac-3 Facility will be supplied by the existing raw water intake structure along the southeast bank of the Cedar Point Lateral (Figure 2, Appendix A; Photograph 7, Appendix B). However, water for the Frac-4 Facility will be supplied by a new raw water intake structure that will be constructed along the southeast bank of the Cedar Point Lateral, east of the existing raw water intake structure (Figure 2, Appendix A; Photograph 6, Appendix B). To pre-treat the raw water for cooling tower make-up, firewater, and reverse osmosis polishing, the following water treatment processes will be constructed: chemical precipitation, clarification, filtration, and disinfection. Treatment processes will be designed primarily for removal of silt, vegetation and biological contaminants. Residuals from the raw water treatment (naturally occurring constituents and water treatment chemicals) will be discharged to

existing NPDES Outfall 001. Process temperatures in the fractionation plant will be controlled using cooling towers, cooling water, and non-contact heat exchangers. Total dissolved solids in the cooling water will be managed by blowing down cooling water to NPDES Outfall 002. The average dry-weather flow rates of Outfalls 001 and 002 are 220 gallons per minute (“gpm”) and 561 gpm respectively. NPDES Outfall 003 is not anticipated to have continuous flow during dry-weather conditions.

NPDES Outfall 001, 002 and 003 will intermittently receive precipitation, firewater, hydrotest, and eye wash/shower (safety equipment) discharges. The 25-year wet-weather flow rates of Outfalls 001, 002, and 003 are approximately 81 cubic feet per second (“cfs”), 57.6 cfs, and 13.6 cfs respectively. Outfall 001 will discharge to a northern unnamed ditch tributary to Smith Gully (Figure 4, Appendix A). Effluent from Outfall 001 will flow approximately 2.9 miles along the unnamed ditch tributary before flowing into Smith Gully south of the Facility. Outfall 002 will discharge to a southern unnamed ditch tributary that is approximately 0.2 miles long and joins Smith Gully south of Winfree Street. Outfall 003 will discharge to an unnamed ditch along Winfree Street that emptied into Smith Gully south of Winfree Street. Effluent from the three outfalls would flow along Smith Gully for approximately 2.5 miles before flowing into Cedar Bayou (Tidal Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) southeast of the Facility. The outfall structures do not empty directly into Cedar Bayou. The point at which Smith Gully empties into Cedar Bayou is approximately 14.2 river miles upstream from Trinity Bay.

Effluent from the Facility will be compliant with published water quality criteria for the receiving water, Cedar Bayou. Outfall effluent quality will be regulated by NPDES Permit No. TX0140091. Anticipated pollutants in dry-weather flows are solely present as a result of presence in the raw intake water, water treatment chemicals, and cooling water chemicals. Effluent quality will be similar to existing trains MB2 and MB3 and an estimate of effluent quality is included in Appendix E for reference. Water treatment and cooling water chemicals are listed below and MSDS Sheets are included in Appendix E.

Table 1-1 Chemicals and Concentrations Used for Water Treatment and Cooling Water

Outfall Number	Average Flow (gpm)	Chemical Name	Application	Average Rate (gpm)	Percent of Effluent Flow by Volume
002	561	GenGard GN8225	Cooling Tower	0.0009	0.0002%
		GenGard GN8020	Cooling Tower	0.0350	0.006%
		Inhibitor AZ8104	Cooling Tower	0.0058	0.001%
		Spectrus BD1501E	Cooling Tower	0.0061	0.001%
		Spectrus NX1100	Cooling Tower	(1)	(1)
		98% Sulfuric Acid	Cooling Tower	0.0951	0.017%
		12.5% NaClO	Cooling Tower	0.0713	0.013%
		38% NaHSO ₃	Cooling Tower	0.0009	0.0002%
001	220	12.5% NaClO	Water Treatment	0.0516	0.023%
		38% NaHSO ₃	Water Treatment	0.0004	0.0002%
		PolyFloc AE1115	Water Treatment	0.0370	0.017%
		KlarAid PC1192	Water Treatment	0.0310	0.014%

(1) Not routinely used

OHLP will neutralize the pH and biocides before discharge to the NPDES Outfalls. The pH will be maintained between 6.5 and 9.0 Standard Units (“S.U.”). Residual chloride will be managed below 33 micrograms per liter (“µg/L”).

Wet-weather effluent quality will be managed by procedural and engineering controls. Engineering controls will be implemented during construction to control erosion and transport of sediment to surface water bodies. Erosion and sediment control measures would be maintained until disturbed areas are stabilized or re-vegetated. During operation, engineering controls such as secondary containment systems around chemical and product storage facilities will prevent leaks and spills from entering the NPDES Outfalls.

ONEOK will prepare a Storm Water Pollution Prevention Plan (“SWPPP”) and Oil and Spill Prevention, Control, and Countermeasure Plan for the Facility. Construction crews and Facility employees would be trained on implementation of these plans during construction, operation, and maintenance. Best Management Practices (“BMPs”) will be implemented in accordance with Section 401 of the Clean Water Act, Chapter 279 of the Texas Water Code, and as described in the SWPPP for the Facility. ONEOK will maintain its BMPs flowing closure of its construction storm water permit of for the facility.

Wastewater quality and quantity from the OHLP fractionation facility (including MB-2, MB-3, Frac-3, and Frac-4) will be monitored and managed to protect human and ecological receptors. Management

techniques include regulatory permits, wastewater pre-treatment processes, procedural controls, engineering controls, and the implementation of BMPs. The management strategy is based upon the operation of similar industrial facilities and a corporate culture of regulatory compliance. The monitoring and management techniques of wastewater quality and quantity from the OHLP fractionation facility (including MB-2, MB-3, Frac-3, and Frac-4) are provided in the existing NPDES Permit No. TX0140091 (Appendix E). The EPA has concluded in the NPDES Permit No. TX0140091 Statement of Basis that the wastewater quality from the OHLP fractionation facility will not have any adverse impacts upon threatened or endangered species within the Action Area.

1.3 IDENTIFICATION OF THE ACTION AREA

For the purposes of the Endangered Species Act Section 7 review, the “Action Area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.”¹ Accordingly, the Action Area encompasses the geographic extent of potential effects that would result directly and indirectly from the proposed action together with the effects of other activities that are interrelated or interdependent with the proposed action. For this biological assessment, the Action Area was determined by identifying the maximum area in which direct or indirect impacts from air contaminant emissions and construction of the Frac-3 and Frac-4 Facility, which includes the proposed Frac-3 and Frac-4 Facility’s laydown areas and tie-ins to existing linear support facilities (electrical distribution, water, etc.), may result from operation of the proposed Frac-3 and Frac-4 Facility.

Based on air emission dispersion modeling (Appendix C), it was determined that emissions from operation of the proposed Frac-3 and Frac-4 Facility would be above a federally-established threshold screening level that is used to delineate the geographical area in which the potential for impacts are evaluated. Emissions from the operation of the proposed Frac-3 and Frac-4 Facility were modeled, and the predicted emission levels were compared to the appropriate Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL). Per 40 CFR §51.165(b)(2), the EPA has established SILs for each criteria pollutant. Each SIL is significantly less than its corresponding National Ambient Air Quality Standard. EPA established the SILs as *de minimis* thresholds; they are not standards. A SIL is a concentration below which project emissions are considered to have no significant contribution to the total ambient air quality concentration. Even if predictive modeling indicates a facility’s emissions of a particular constituent will result in concentrations above a given SIL, it does not mean that the actual emissions overall are significant, but further analysis is required to determine whether the project will

¹ *Code of Federal Regulations*, Interagency Cooperation-Endangered Species Act of 1973, as Amended, Title 50, Section 402.02

cause or contribute to the violation of a NAAQS. If the predicted level of a pollutant was less than its corresponding SIL, then no further analysis is required. The Action Area for this Biological Assessment was defined based upon the greatest radius at which predicted levels of CO, NO₂, SO₂, or PM₁₀ and PM_{2.5} were higher than the SIL applicable for each constituent's corresponding NAAQS standard and averaging period.

Air dispersion modeling-predicted Frac-3 and Frac-4 Facility emissions would be higher than the 8-hour CO, 1-hour NO₂, Annual NO₂, 24-hour PM₁₀, Annual PM₁₀, 24-hour PM_{2.5}, Annual PM_{2.5}, 1-hour SO₂, and 24-hour SO₂ SILs and lower than the 1-hour CO, 3-hour SO₂, and annual SO₂, SILs (Table 1-2). Additionally, the air dispersion modeling analysis predicted the following radii for potential impacts resulting from air emissions from the Frac-3 and Frac-4 Facility.

- Predicted emissions were above the 8-hour CO SIL as far out as 0.51 kilometers (km) or 0.32 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the 1-hour NO₂ SIL as far out as 4.47 km or 2.78 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the annual NO₂ SIL as far out as 0.28 km or 0.17 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the 24-hour PM₁₀ SIL as far out as 0.60 kilometers (km) or 0.37 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the annual PM₁₀ SIL as far out as 0.53 km or 0.33 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the 24-hour PM_{2.5} SIL as far out as 0.90 km or 0.56 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the annual PM_{2.5} SIL as far out as 0.57 kilometers (km) or 0.35 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the 1-hour SO₂ SIL as far out as 1.08 km or 0.67 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility
- Predicted emissions were above the 24-hour SO₂ SIL as far out as 0.76 km or 0.47 miles from the sources of air emissions from the Frac-3 and Frac-4 Facility

The boundary of the Action Area was determined to be the greatest of the nine distances at which predicted emissions were above a SIL. Accordingly, the Action Area extends 4.47 km (2.78 miles) out from the sources of air emissions from the Frac-3 and Frac-4 Facility (Figures 2 and 3, Appendix A). The

potential for impacts to protected resources from the proposed Frac-3 and Frac-4 Facility was evaluated within the defined Action Area.

Table 1-2 Summary of Criteria Pollutant Air Modeling Results
(Taken from the Air Emission Dispersion Model in Appendix D)

Pollutant	Averaging Time	SIL* ($\mu\text{g}/\text{m}^3$)	Max Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Potential Impact	Radius of Potential Impact (km)	PSD Primary NAAQS Standard ($\mu\text{g}/\text{m}^3$ **)	PSD Secondary NAAQS Standard ($\mu\text{g}/\text{m}^3$ **)	PSD Increment Standard ($\mu\text{g}/\text{m}^3$ ***)
CO	1-hour	2,000	1313	No	N/A	40,000	N/A	N/A
CO	8-hour	500	832	Yes	0.51	10,000	N/A	N/A
NO ₂	1-hour	7.5	12.3	Yes	4.47	188	N/A	N/A
NO ₂	Annual	1	1.43	Yes	0.28	100	100	25
PM ₁₀	24-hour	5	13.2	Yes	0.60	150	150	30
PM ₁₀	Annual	1	2.51	Yes	0.53	50	50	17
PM _{2.5}	24-hour	1.2	3.3	Yes	0.90	35	35	9
PM _{2.5}	Annual	0.3	0.66	Yes	0.57	12	15	4
SO ₂	1-hour	7.8	11.7	Yes	1.08	196	N/A	N/A
SO ₂	3-hour	25	10.7	No	N/A	N/A	1300	512
SO ₂	24-hour	5	6.3	Yes	0.76	365	N/A	91
SO ₂	Annual	1	0.48	No	N/A	80	N/A	20

* Per *Code of Federal Regulations*, Permit Requirements, Title 40, Section 51.165(b)(2); for 1-hour NO₂, SIL taken from TCEQ's July 22, 2010 "Interim 1-Hour Nitrogen Dioxide (NO₂) NAAQS Implementation Guidance"; for 1-hour SO₂, SIL taken from TCEQ's August 1, 2010 "Interim 1-Hour Sulfur Dioxide (SO₂) NAAQS Implementation Guidance"

** From www.epa.gov/air/criteria.html, converted to the appropriate units of measurement as necessary

*** From *Code of Federal Regulations*, Prevention of Significant Deterioration of Air Quality, Title 40, Section 51.166(c)(1), Ambient air increments and other measures.

An air quality analysis was also conducted for project emissions of non-criteria pollutants (that is, pollutants for which there is no federal ambient air quality standard). The modeled non-criteria pollutants include those represented in the permit application (e.g. butanes) and products of natural gas and diesel combustion that are hazardous air pollutants (HAPs) with emission factors listed in AP-42 Sections 1.4 and 3.3, respectively. Diethanolamine (DEA) and hot oil (Therminol 55) were included in the equipment leak fugitive emission calculations in the permit application; however, these chemicals were not modeled because they are not volatile enough to be considered air contaminants, per TCEQ guidance.² DEA and hot oil each have a vapor pressure less than 0.01 mmHg at 40°C. Carbon dioxide, ethane, hydrogen,

² <http://www.tceq.texas.gov/assets/public/permitting/air/memos/vapor4.pdf>

methane, nitrogen, and propane were also not included in the air quality analysis because they are simple asphyxiants, per TCEQ guidance.³

Because of the large number of non-criteria pollutants evaluated, a scaling procedure was used to limit the number of modeling runs required. A single run (labeled VOC) was performed to address pollutants emitted solely from the natural gas and/or diesel combustion sources. The maximum off-property impact determined using the VOC modeling run was then scaled to determine the maximum off-property impact of other non-criteria pollutants.

The following pollutants are emitted from sources other than natural gas or diesel combustion units and were modeled using chemical-specific modeling runs:

- Ammonia
- Butanes
- Hydrogen sulfide (“H₂S”)
- Hexanes and heavier (Hexanes+)
- Pentanes

The non-criteria pollutant emissions from the proposed project were modeled, and compared to the appropriate Effects Screening Level (“ESL”) established by the TCEQ. ESLs are not standards. ESLs are permit review screening tools used to evaluate ambient air concentrations of constituents, based on a constituent’s potential to cause adverse health effects, odor nuisances, vegetation effects, or materials damage. The ESLs are set at levels lower than levels known to produce adverse health effects and are set to protect the general public. Concentrations above an ESL trigger a more in-depth health effects review by TCEQ.

Per TCEQ’s modeling and effects review procedure, no further analysis is required if the maximum off-property concentration from routine Project emissions is less than 10% of the pollutant’s ESL and if the maximum off-property concentration from Project MSS emissions is not above the pollutant’s ESL for more than 24 hours per year. Only the following pollutants are predicted to exceed 10% ESL from routine Project emissions; all other non-criteria pollutants have maximum predicted off-property concentrations from routine emissions that are below 10% of each constituent’s ESL (Table 1-3):

- Acetaldehyde (25% of ESL)

³ <http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/mera.pdf>

- Acrolein (85% of ESL)
- Formaldehyde (150% of ESL)
- Polycyclic Aromatic Hydrocarbons (PAH, 28% of ESL)

A natural gas-fired emergency engine (ENG09) that will be installed at the Frac-3 and Frac-4 Facility is the culpable source for each of these pollutants. Per TCEQ's modeling and effects review procedure, emissions from units fired only by pipeline-quality natural gas do not require effects review. Based on TCEQ's experience from many prior reviews, no adverse health or welfare impacts from these source types are expected. Each emergency engine will be authorized to operate only 100 hours per year for planned testing. The air permit application modeling run assumes each engine will run at its maximum allowable rate for every hour of the year. In actual operation, it is extremely unlikely each engine will be emitting at its maximum allowable rate at the same time as worst-case meteorological conditions occur. Additionally, there is no nearby natural gas-fired source whose impacts are likely to add significantly to the predicted concentration. Therefore, no adverse health effects, odor nuisances, vegetation effects, or materials damage are expected as a result of routine Project air emissions of non-criteria pollutants.

Only the following pollutants are predicted to exceed 100% ESL from Project maintenance, startup, and shutdown ("MSS") emissions:

- Ammonia (110% ESL)
- Hexanes+ (160% ESL)
- Pentanes (390% ESL)

Per TCEQ guidance no further review is required if the maximum off-property concentration from Project MSS emissions is not above the pollutant's ESL for more than 24 hours per year. Project MSS emissions of ammonia will not exceed the ESL for more than 16 hours per year (as limited by the emission rate calculations). Project MSS emissions of Hexanes+ will not exceed the ESL for more than 93 hours per year (as limited by the air permit application modeling results). Project MSS emissions of Pentanes will not exceed the ESL for more than 275 hours per year (as limited by the air permit application modeling results). Residual MSS emissions to the atmosphere (MSS-FUG-3) are the culpable source for each of these pollutants. The model's predicted concentration and frequency of exceedance are extremely conservative because:

- All residual MSS degassing emissions are modeled as if they occur in the same small location, which is as close to the property line as possible. In actual operation, residual degassing emissions will be distributed throughout the new process units.

- Residual MSS degassing emissions are expected to occur no more than 534 hours per year. In actual operation, it is extremely unlikely the residual MSS degassing emissions will occur at their maximum allowable rate at the same time as worst-case meteorological conditions occur.

The predicted ESL exceedances for Pentanes and Hexanes+ are concentrated within a small area along the eastern property boundary near the modeled MSS source (MSS-FUG-3). This area consists of vacant land and unmanned oil and gas production sites. No adverse health effects, odor nuisances, vegetation effects, or materials damage are expected as a result of Project air emissions of non-criteria pollutants.

Table 1-3 Summary of Non-criteria Pollutant Air Modeling Results
(Taken from the Air Emission Dispersion Model in Appendix D)

Chemical	Cumulative Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	ESL ($\mu\text{g}/\text{m}^3$)	Concentration as Percent of ESL
1,1,2,2-Tetrachloroethane	2.51E-02	70	3.6E-02
1,1,2-Trichloroethane	1.52E-02	550	2.8E-03
1,1-Dichloroethane	1.12E-02	4,000	2.8E-04
1,2-Dichloroethane	1.12E-02	160	7.0E-03
1,2-Dichloropropane	1.29E-02	460	2.8E-03
1,3-Butadiene	7.08E-01	510	1.4E-01
1,3-Dichloropropene	1.26E-02	45	2.8E-02
2-Methylnaphthalene	9.30E-06	30	3.1E-05
3-Methylchloranthrene	7.04E-07	0.02	3.5E-03
7,12-Dimethylbenz(a)anthracene	6.29E-06	0.5	1.3E-03
Acenaphthene	1.75E-03	1	1.8E-01
Acenaphthylene	6.26E-03	1	6.3E-01
Acetaldehyde	3.72E+00	15	2.5E+01
Acrolein	2.73E+00	3.2	8.5E+01
Ammonia	1.77+00 (Routine) 1.923+03 (MSS, only 16 hr/yr)	170	1.0E+00 (Routine) 1.1E+03 (MSS, only 16 hr/yr)
Anthracene	9.30E-07	0.5	1.9E-04
Arsenic	7.80E-05	3	2.6E-03
Benz(a)anthracene	2.08E-03	0.5	4.2E-01
Benzene	2.72E+00	170	1.6E+00
Benzo(a)pyrene	2.33E-04	0.03	7.8E-01
Benzo(b)fluoranthene	1.23E-04	0.5	2.5E-02
Benzo(g,h,i)perylene	6.05E-04	0.5	1.2E-01
Benzo(k)fluoranthene	1.92E-04	0.5	3.8E-02
Beryllium	4.53E-06	0.02	2.3E-02
Butanes	5.19+02 (Routine) 5.89+04 (MSS)	66,000	7.9E-01 (Routine) 8.9E+01 (MSS)

Table 1-3 Summary of Non-criteria Pollutant Air Modeling Results
(Taken from the Air Emission Dispersion Model in Appendix D)

Chemical	Cumulative Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	ESL ($\mu\text{g}/\text{m}^3$)	Concentration as Percent of ESL
Cadmium	4.28E-04	0.1	4.3E-01
Carbon Tetrachloride	1.76E-02	130	1.4E-02
Chlorobenzene	1.28E-02	460	2.8E-03
Chloroform	1.36E-02	100	1.4E-02
Chromium	5.53E-04	3.6	1.5E-02
Chrysene	4.37E-04	0.5	8.7E-02
Cobalt	3.27E-05	0.2	1.6E-02
Dibenzo(a,h)anthracene	7.20E-04	0.5	1.4E-01
Dichlorobenzene	4.53E-04	600	7.5E-05
Ethylbenzene	2.46E-02	740	3.3E-03
Ethylene Dibromide	2.12E-02	4	5.3E-01
Fluoranthene	9.41E-03	0.5	1.9E+00
Fluorene	1.03E-06	10	1.0E-05
Formaldehyde	2.19E+01	15	1.5E+02
H ₂ S	2.00E-02	108	1.9E-02
Hexanes+	1.49+02 (Routine) 8.55+03 (MSS)	5,300	2.8E+00 (Routine) 1.6E+02 (MSS)
Indeno(1,2,3-cd)pyrene	4.63E-04	0.5	9.3E-02
Manganese	1.43E-04	2	7.2E-03
Methanol	3.04E+00	2,620	1.2E-01
Methylene Chloride	4.11E-02	3,600	1.1E-03
Mercury	9.56E-05	0.1	9.6E-02
Naphthalene	2.01E-01	200	1.0E-01
Nickel	8.05E-04	0.33	2.4E-01
PAH	1.40E-01	0.5	2.8E+01
Pentanes	2.83+02 (Routine) 1.62+04 (MSS)	4,100	6.9E+00 (Routine) 3.9E+02 (MSS)
Phenanathrene	6.54E-06	0.5	1.3E-03
Pyrene	5.91E-03	0.5	1.2E+00
Selenium	9.30E-06	2	4.7E-04
Styrene	1.18E-02	110	1.1E-02
Toluene	1.06E+00	3,470	3.1E-02
Vinyl Chloride	7.14E-03	20,000	3.6E-05
Xylenes	5.45E-01	350	1.6E-01

2.0 PROTECTED RESOURCES

According to the FWS, three endangered species and three threatened species are known or likely to occur within Chambers County (Table 2-1). Additionally, one federally listed candidate species, one federally listed threatened species, and two federally listed endangered species are known or likely to occur in Chambers County according to TPWD data. At the request of the EPA, the whooping crane, which is federally listed as endangered, was also evaluated. The whooping crane winters in marshes along the Gulf Coast of Texas.

Table 2-1 Protected Species Known or Likely to Occur within Chambers County

Common Name	Scientific Name	Federal Status	Critical Habitat Designated in Chambers County
Green Sea Turtle ¹	<i>Chelonia mydas</i>	Threatened	No
Hawksbill Sea Turtle ¹	<i>Eretmochelys imbricata</i>	Endangered	No
Kemp's Ridley Sea Turtle ¹	<i>Lepidochelys kempii</i>	Endangered	No
Leatherback Sea Turtle ¹	<i>Dermochelys coriacea</i>	Endangered	No
Loggerhead Sea Turtle ¹	<i>Caretta caretta</i>	Threatened	No
Louisiana Black Bear ²	<i>Ursus americanus luteolus</i>	Threatened	No
Piping Plover ³	<i>Charadrius melodus</i>	Threatened	No
Red Wolf ²	<i>Canis rufus</i>	Endangered	No
Smalltooth Sawfish ²	<i>Pristis pectinata</i>	Endangered	No
Sprague's Pipit ²	<i>Anthus spragueii</i>	Candidate	No
Whooping Crane	<i>Grus americana</i>	Endangered	No

Source: U.S. Fish and Wildlife Service, 2014; Texas Parks and Wildlife Department, 2012.

¹ Appears only on the FWS list of protected species known or likely to occur in Chambers County.

² Appears only on the TPWD list of protected species known or likely to occur in Chambers County.

³ Appears on both the FWS and TPWD lists of protected species known or likely to occur in Chambers County.

2.1 FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES

2.1.1 Green Sea Turtle (*Chelonia mydas*)

The green sea turtle is a medium-to-large sea turtle that inhabits tropical and subtropical marine habitats along the southeastern Atlantic Coast, Gulf Coast, and California Coast of the U.S. (Earnst, Lovisch, and Barbour, 1994). This sea turtle migrates across the open seas but is often found feeding in shallow water marine habitats supporting submerged vegetation, small mollusks, crustaceans, sponges, and jellyfish (Earnst and Barbour, 1989). In the Gulf, mating occurs in shallow waters and eggs are deposited on

beaches from June through September. Adult female green sea turtles show high site fidelity, returning regularly to the same beach year after year to lay eggs. Green sea turtles often deposit their eggs on beaches that are also used by other sea turtles as nest sites. For this reason, the FWS has placed emphasis on protecting known nesting beaches from development and exploitation. According to the FWS, the green sea turtle is known or likely to occur in Chambers County (U.S. Fish and Wildlife Service, 2014); however, critical habitat for this species has not been designated in Chambers County.

2.1.2 Hawksbill Sea Turtle (*Eretmochelys imbricata*)

The hawksbill sea turtle is a small-to-medium sea turtle that inhabits tropical marine habitats, such as mangrove bays, estuaries, and coral reefs, but occasionally occurs in subtropical marine habitats along the southeastern Atlantic Coast, Gulf Coast, and California Coast of the U.S. (Earnst, Lovisch, and Barbour, 1994). This sea turtle feeds almost exclusively on sponges but also consumes mollusks, crustaceans, and jellyfish (Earnst and Barbour, 1989). The nesting season for the hawksbill sea turtle occurs between April and November on undisturbed deep-sand beaches within the tropics (U.S. Fish and Wildlife Service, 2013).

According to the FWS, the hawksbill sea turtle is known or likely to occur in Chambers County; however, critical habitat for the hawksbill sea turtle has not been designated in Chambers County (U.S. Fish and Wildlife Service, 2013 and 2014). Additionally, no recent sightings of nesting hawksbill sea turtles have been observed in Chambers County (Coyne, 2014).

2.1.3 Kemp's Ridley Sea Turtle (*Lepidochelys kempi*)

The Kemp's ridley sea turtle is a small sea turtle that is rarely found outside of the Gulf of Mexico but is frequently spotted off the west coast of Florida (Earnst, Lovisch, and Barbour, 1994). Almost all nesting of the Kemp's ridley sea turtle occurs on the southern coast of Mexico from April through July (Earnst and Barbour, 1989; Cannatella and LaDuc, 2014). This sea turtle eats mollusks, crustaceans, clams, and jellyfish. According to the FWS, the Kemp's ridley sea turtle is known to occur in Chambers County (U.S. Fish and Wildlife Service, 2014). Critical habitat for this species has not been designated in Chambers County; however, Kemp's ridley sea turtles have been observed depositing their eggs on the beaches of Bolivar Peninsula in adjacent Galveston County (Coyne, 2014).

2.1.4 Leatherback Sea Turtle (*Dermochelys coriacea*)

The leatherback sea turtle is a very large sea turtle that inhabits pelagic (open water) tropical and subtropical marine habitats and ocean currents along the Atlantic Coast, Gulf Coast, and Pacific Coast of the U.S. (Earnst, Lovisch, and Barbour, 1994). This sea turtle migrates great distances across the open

seas, feeding almost exclusively on jellyfish, and only occasionally entering the shallow waters of bays and estuaries to mate and access nesting beaches (Earnst and Barbour, 1989). Female leatherback sea turtles deposit their eggs from March to August on sloping, sandy beaches with vegetation, often near deep rough waters (NatureServe, 2013). Critical habitat for the leatherback sea turtle has not been designated in Chambers County (U.S. Fish and Wildlife Service, 2014). Additionally, no recent sightings of nesting leatherback sea turtles have been observed in Chambers County (Coyne, 2014).

2.1.5 Loggerhead Sea Turtle (*Caretta caretta*)

The loggerhead sea turtle is a large sea turtle that inhabits tropical and subtropical marine habitats along the southeastern Atlantic Coast, Gulf Coast, and California Coast of the U.S. (Earnst, Lovisch, and Barbour, 1994). This sea turtle migrates across the open seas but is often found feeding in shallow water marine habitats and the mouths of rivers that support submerged vegetation, small mollusks, crustaceans, sponges, mussels, clams, oysters, shrimp, sea urchins, and jellyfish (Earnst and Barbour, 1989). From April to September, female loggerhead sea turtles deposit their eggs on open sandy beaches, preferably with steep declines and gradual offshore landings (NatureServe, 2013). According to the FWS, the loggerhead sea turtle is known or likely to occur in Chambers County (U.S. Fish and Wildlife Service, 2014).

Loggerhead sea turtles have been reported along the most of the Texas Gulf Coast (Cannatella and LaDuc, 2014). Although critical habitat for loggerhead sea turtles has not been designated in Chambers County, they have been observed depositing their eggs on the beaches of Bolivar Peninsula in adjacent Galveston County (U.S. Fish and Wildlife Service, 2014; Coyne, 2014).

2.1.6 Louisiana Black Bear (*Ursus americanus luteolus*)

The Louisiana black bear primarily occurs within the Atchafalaya and Tensas River Basins in Louisiana but individuals may occasionally wander into eastern Texas (Campbell, 2003). This large bulky black bear is one of sixteen subspecies of the American black bear. The Louisiana black bear is distinguished by its longer, narrow, and flatter skull with proportionate molar teeth. Adult males typically weigh 300-400 pounds or greater, while females range in weight from 120-180 pounds or more. This subspecies is primarily omnivorous, consuming acorns, berries, carrion, insect larvae, garbage, and agricultural crops such as corn, wheat, and sugarcane. Females give birth every other year between mid-January and mid-February to one to three cubs (Campbell, 2003).

These bears typically inhabit remote areas that consist of large contiguous areas of bottomland hardwood forests, mixed forests, and brackish and freshwater marshes. This species may also be found in the

vicinity of salt domes and wooded corridors along spoil levees, canals, and bayous that provide food, water, cover, and denning sites (Campbell, 2003). Major declines in this species can be attributed to human disturbance, human harvest/conflict, and habitat fragmentation (Campbell, 2003). The Louisiana black bear is a federally threatened species that could occur in Chambers County; however, it is not currently included on the FWS list of protected species known or likely to occur in Chambers County.

2.1.7 Piping Plover (*Charadrius melodus*)

The piping plover is a small, six- to seven-inch long plover. Its back and upper parts are sandy gray and it is whitish below. It has a narrow black band above the forehead which reaches from eye to eye, a complete or incomplete dark ring around the neck, and yellow-orange legs. In summer, the piping plover has a yellow-orange bill with a dark tip. In winter, the bill and legs are dark. The piping plover winters along the southeastern coast and Gulf Coast of the United States and typically arrives at its prairie breeding grounds within the Great Plains of North America in early May. Historically, this species bred along the Atlantic Coast, the Great Lakes, and along the major rivers and streams within the Great Plains (U.S. Fish and Wildlife Service, 1992). Recreational uses of beaches and the channelization and damming of rivers have reduced the amount of beach and sandbar nesting habitat along major streams and coastal areas and have caused the decline of the piping plover. The piping plover migrates through Texas each spring and fall. Chambers County is situated along the probable migratory pathway between breeding and winter habitats.

Potential habitats for the piping plover in Texas are described as open beaches, sand flats, mudflats, algal mats, emergent sea grass beds, wash-over passes, and small dunes from accumulated sands (Campbell, 2003). According to the FWS, critical habitat for wintering piping plovers exists along the northeastern tip of Galveston Island and Bolivar Peninsula.⁴ The piping plover's specific habitat requirements, the scarcity of areas free from human disturbance, and predator threats such as dogs, raccoons, foxes, and skunks, have likely resulted in the birds decline (Campbell, 2003). Thus, the potential of piping plovers in the vicinity of the Facility is extremely low.

2.1.8 Red Wolf (*Canis rufus*)

The red wolf is a medium sized wolf that is larger than a coyote but smaller than the gray wolf. The red wolf also has a narrower nose pad and hind feet than the gray wolf and a gray dorsal pelage with interspersed black, yellow, or reddish hairs that may also be found on the legs and underparts

⁴ U.S. Fish and Wildlife Service. Critical Habitat Mapper. <http://criticalhabitat.fws.gov/crithab/>. Accessed November 13, 2013.

(NatureServe, 2013). This wolf is an opportunistic predator feeding on rabbits, rodents, deer, birds, and carrion. The red wolf is primarily found in upland and lowland forests of coniferous, hardwood, and mixed forest types, as well as in shrublands/chaparral. Females mature after three years and give birth to an average litter size of six to seven pups from March to May (NatureServe, 2013). The red wolf is a federally endangered species that is thought to be extirpated from the state of Texas. This species is currently only found in the states of North and South Carolina (NatureServe, 2013).

2.1.9 Smalltooth Sawfish (*Pristis pectinata*)

The smalltooth sawfish commonly reaches 18 feet in length and may grow up to 25 feet. This cartilaginous fish inhabits shallow coastal waters of tropical seas and is often found close to shore in sheltered bays, shallow banks, estuaries, and river mouths (National Oceanic and Atmospheric Administration, 2013). Although the range of this fish extended all throughout the Gulf of Mexico, currently the only known populations exist along the Florida peninsula. This fish primarily feeds on other fish and some crustaceans. Females are ovoviviparous and give birth to approximately 15 to 20 pups. Threats to smalltooth sawfish include entanglement in commercial fishing nets and habitat depletion (National Oceanic and Atmospheric Administration, 2013). The smalltooth sawfish is a federally endangered species that likely does not occur near Chambers County according to the National Oceanic and Atmospheric Administration (“NOAA”), and is not currently included on the FWS list of protected species known or likely to occur in Chambers County.

2.1.10 Whooping Crane (*Grus americana*)

The whooping crane is the tallest bird in North America with adult males standing at nearly five feet in height. This white bird is easily distinguished from herons by the feathers overlaying the rump and from Sandhill Cranes by color and wingspan (Campbell, 2003). There are both migratory and non-migratory flocks of whooping crane in the United States. The largest flock of whooping cranes winters on the Texas coast at the Aransas National Wildlife Refuge and nests in Wood Buffalo National Park in Alberta and Northwest Territories, Canada.

Whooping cranes use a variety of habitats during migration. Suitable stopover habitat during migration may include crop fields, large wetlands, and large riverine habitats that are away from human disturbances. Key stopover areas within the migratory flight path are large rivers and wetlands within the plains of Nebraska and Oklahoma that contain submerged sandbars, have wide unobstructed channels, and are isolated from human disturbances (Campbell, 2003). Wintering habitat on the Texas coast consists of brackish bays, marshes, and salt flats; however, occasionally upland sites are used to forage for food. Threats to this bird can be attributed to the conversion of native prairies and potholes to

agriculture fields. Power line strikes are also responsible for increased mortality (Campbell, 2003). According to historic and current occurrence data the main migration corridor for this species occurs west of the City of Houston (U.S. Fish and Wildlife Service, 2009). The whooping crane is not currently included on the FWS or TPWD list of protected species known or likely to occur in Chambers County.

2.2 FEDERALLY LISTED CANDIDATE SPECIES

2.2.1 Sprague's Pipit (*Anthus spragueii*)

The Sprague's pipit is a pale, thin billed, sparrow sized grassland bird with a heavily streaked back that prefers short grass and mixed grass prairies, alkaline meadows, and wet meadows (NatureServe, 2013). Migration takes place between mid-April and mid-May. During the migration and wintering seasons, this bird will use pastures, weedy fields, densely vegetated grasslands, and overgrown agricultural fields for suitable roosting and foraging habitat. This bird migrates south to areas of Texas for wintering grounds. The Sprague's pipit primarily feeds on a variety of seeds and insects including grasshoppers, crickets, ants, weevils, stink bugs, and caterpillars (NatureServe, 2013). Populations of this species have been experiencing a long term decline in connection with habitat loss, degradation, and fragmentation. The Sprague's pipit is a federal candidate species that may occur in Chambers County; however, it is not currently included on the FWS list of protected species known or likely to occur in Chambers County.

2.3 CRITICAL HABITAT

According to the FWS, no critical habitat has been designated within Chambers County.⁵ The nearest designated critical habitat to the proposed Frac-3 and Frac-4 Facility is for piping plovers and it is located approximately 33 miles south of the proposed Frac-3 and Frac-4 Facility on Galveston Island and the Bolivar Peninsula (Galveston County), which is situated between Galveston Bay and the Gulf of Mexico.

2.4 SENSITIVE SPECIES AND SPECIES OF CONCERN

The bald eagle was removed from the list of threatened and endangered species under the Endangered Species Act because it is considered recovered; however, the U.S. Fish and Wildlife Service is monitoring this species. The bald eagle is protected under the Bald and Golden Eagle Protection Act. Additionally, the bald eagle and birds that migrate through Texas are protected by the Migratory Bird Treaty Act. Marine mammals that occur along the coast of Texas are protected by the Marine Mammal Protection Act.

⁵ U.S. Fish and Wildlife Service. Critical Habitat Mapper. <http://criticalhabitat.fws.gov/crithab/>. Accessed November 13, 2013.

2.4.1 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a large North American raptor with a wingspan of six to eight feet (Buehler, 2000). The bald eagle has been removed from the threatened and endangered species list under the Endangered Species Act but still remains protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The bald eagle is a year-round resident of Texas and nesting sites have been documented within Chambers County (Campbell 2003). Nesting and roosting sites are generally found within one to two miles of a large body of water, undisturbed coastal regions, or along river systems and lake shores (Campbell 2003). Nests are typically built well above any aerial obstructions in very large bald cypress, water oak, American elm, cottonwood, sycamore, and pecan trees (Campbell 2003). According to Texas Natural Diversity Database records, known nesting sites for the bald eagle are located approximately 6.5 miles east of the proposed Frac-3 and Frac-4 Facility site in the vicinity of Lake Charlotte and 12 miles to the southeast of the proposed Frac-3 and Frac-4 Facility site, south of Lake Anahuac.

2.4.2 Marine Mammals

A total of 26 species of cetaceans (whales, porpoises, and dolphins) and one species of siren (manatee) are known or likely to inhabit Texas coastal marine waters. All are protected under the Marine Mammal Protection Act of 1972. Although, sightings of sperm whales (*Physeter macrocephalus*), short-finned pilot whales (*Globicephala macrorhynchus*), and Atlantic spotted dolphins (*Stenella frontalis*) are relatively common near the Texas coast, the bottlenose dolphin (*Tursiops truncatus*) is thought to be the most common marine mammal along the coast of Texas (Campbell, 2003). Sightings of the endangered West Indian manatee have been increasing in Galveston Bay and along the Texas coast (Rice, 2012). At least five marine mammal species, the bottlenose dolphin, rough-toothed dolphin (*Steno bredanensis*), the endangered fin whale (*Balaenoptera physalus*), the endangered humpback whale (*Megaptera novaeangliae*), and the endangered West Indian manatee (*Trichechus manatus*), have been recorded due to sightings and stranding along the coast of Chambers County, Bolivar Peninsula (Galveston County), or within Trinity and Galveston Bay (Campbell, 2013; Texas Marine Mammal Stranding Network, 2014).

2.4.3 Migratory Birds

A total of 1,026 migratory bird species that occur in the United States (including Hawaii) and the U.S. territories are protected by the Migratory Bird Treaty Act.⁶ Many of the species protected by the Migratory Bird Treaty Act occur in Texas. As of June 19, 2013, a total of 639 bird species have been

⁶ “General Provisions; Revised List of Migratory Birds,” 78 Federal Register 212 (November 1, 2013) pp. 65844-65864 (to be codified at 50 CFR Parts 10 and 21). Retrieved from <http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/MBTA%20List%20of%20Brds%20Final%20Rule.pdf> on January 6, 2014.

recorded in the State of Texas (Texas Bird Records Committee, 2013). Almost all of the bird species known to occur in Texas, except exotic species (house sparrow, European starling, and pigeons) and some game birds (quail, turkeys, and grouse) are considered migratory birds and protected by the Migratory Bird Treaty Act. The nesting season of migratory bird species, which may extend from February to October, depends on the species and is the primary restriction for development projects under the Migratory Bird Treaty Act. If done outside of the nesting seasons, land disturbance and vegetation clearing can be done with few restrictions.

2.4.4 Essential Fish Habitat

The various life stages of managed marine species use a wide diversity of habitats. Habitats identified as essential fish habitat for managed marine species range from freshwater stream and estuarine habitats to marine habitats. According to the TPWD, the estuary at the mouth of Cedar Bayou, which is located approximately 10 miles southwest of the Frac-3 and Frac-4 Facility, is an important spawning area for fish, shrimp, and oysters (Texas Parks and Wildlife Department, 2014). Shrimp, crabs, and oysters make up the majority of the commercial harvest within Galveston Bay and Trinity Bay but southern flounder (*Paralichthys lethostigma*), black drum (*Pogonias cromis*), striped mullet (*Mugil cephalus*), and sheepshead (*Archosargus probatocephalus*) are also commercially fished (Galveston Bay Information Center, 2014). Popular sport fish in the Galveston Bay area include the spotted seatrout (*Cynoscion nebulosus*), sea trout (*C. arenarius*), redfish (*Sciaenops ocellatus*), and southern flounder. According to NOAA, the nearest mapped essential fish habitat is located within Cedar Bayou, south of State Highway 146, in Baytown.⁷

2.5 TEXAS NATURAL DIVERSITY DATABASE REVIEW

Texas Natural Diversity Database (TNDD) element occurrence records for rare and protected species were reviewed on November 11, 2013, for the proposed Frac-3 and Frac-4 Facility footprint and surrounding areas. Based on the results of the records review, no elements of occurrence records for rare and protected species are located within the proposed Frac-3 and Frac-4 Facility footprint. The closest element occurrence record is for nesting bald eagles along Trinity River, located approximately 8 miles to the east of the proposed Frac-3 and Frac-4 Facility. The nesting bald eagles were last observed at this location in 1996.

⁷ National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Essential Fish Habitat Mapper. <http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html>. Accessed January 6, 2014.

3.0 EXISTING ENVIRONMENT

On December 9 through 11, 2013, a biologist from Burns & McDonnell Engineering Co., Inc., surveyed the Action Area to determine the presence of suitable habitat for protected or sensitive species. The survey included a pedestrian survey of the proposed Frac-3 and Frac-4 Facility site and adjacent ONEOK facility properties that are not restricted by stringent safety requirements. A windshield survey along accessible public roads was also conducted for all terrestrial habitats on private property within the Action Area. Private properties were not accessed if landowner permission was not obtained. Photographs of private properties that were not accessed were taken from public roads.

Data was collected to describe the existing vegetation communities, identify wildlife species present, and assess the potential for protected and sensitive species to occur on the proposed Frac-3 and Frac-4 Facility site and within the Action Area. The existing site characteristics observed are described below and illustrated on Figure 3, Appendix A. Representative photographs taken of the Facility site and during the windshield survey of areas within and just outside of the Action Area are included in Appendix B.

Prior to the field survey, a detailed literature review was conducted to gather available information regarding protected and sensitive species that may occur within the Action Area and current information on potential impacts of air emissions on protected and sensitive species and designated critical habitat.

3.1 DESCRIPTION OF THE FACILITY SITE AND ACTION AREA

The proposed Frac-3 and Frac-4 Facility is located in a previously disturbed area within the hill mixed use (HMU) district of the City of Mont Belvieu. The HMU district is intended to accommodate continued mixed use development in the hill and westside industrial district as described in the 2010 City of Mont Belvieu Comprehensive Plan.⁸ Based on data from the National Land Cover Database (“NLCD”), most of the Action Area consisted of pasture (33.7 %), woodlands (22.7 %), developed (15.7 %) and developed open space (11.8 %), land uses (Figures 5 and 6, Appendix A).⁹ A smaller fraction of the Action Area consisted of cropland (7.8 %), grasslands (3 %), open water (1.8 %), emergent wetland (1.6 %), scrub-shrub (1.5 %), and barren land (0.4 %) areas. These land use areas were verified during the windshield survey of the Action Area. Currently, the site of the Frac-3 and Frac-4 Facility consists mostly of a previously disturbed area that includes the construction laydown area and construction contractor parking lot for construction of the MB3 Facility (Figure 2, Appendix A; Photographs 1 through 11, Appendix B).

⁸ Mont Belvieu, Texas Code of Ordinances (<http://library.municode.com/index.aspx?clientId=14580>) and City of Mont Belvieu Comprehensive Plan 2010 Map (<http://www.montbelvieu.net/DocumentCenter/Home/View/10>)

⁹ National Land Cover Database data downloaded from <http://www.mrlc.gov/nlcd2006.php>

Above- and below-ground pipeline transmission corridors, petroleum wells and pumpjacks, and manmade water storage cells were also present on and adjacent to the proposed Frac-3 and Frac-4 Facility site and within the Action Area. Additional land uses within the Action Area surrounding the proposed Frac-3 and Frac-4 Facility site consist of previously developed or disturbed areas associated with petrochemical facilities, pastures, residential neighborhoods, public road corridors, and retail and commercial establishments (Field Notes, Appendix C). The majority of the petrochemical facilities and retail and commercial properties occur along State Highway 146 and Farm to Market Road 1942.

3.2 TOPOGRAPHY AND CLIMATE

According to the U.S. Geological Survey Mont Belvieu, Texas, 1:24,000 Topographic Quadrangle Map, the elevation within the Action Area ranges from 40 to 60 feet above mean sea level (Figure 4, Appendix A). Mont Belvieu, which is located along the southeast coast of Texas, experiences a subtropical humid climate because of the prevailing onshore flow of tropical maritime air from the Gulf of Mexico (Larkin and Bomar, 1983). Temperatures range from an average daytime high of 92 degrees Fahrenheit in July and August to an average low of 42 degrees Fahrenheit in January.¹⁰ May and June are the wettest months, on average, with average precipitation ranging from 5.45 to 6.67 inches.

3.3 WATER RESOURCES

Water resources within the Action Area include two unnamed tributaries to Smith Gully, the Coastal Water Authority Canal, Buck Creek, Cherry Point Gully, Old River, and Cedar Bayou. Both unnamed tributaries to Smith Gully are located on ONEOK property but neither occurs within the footprint of the Frac-3 and Frac-4 Facility. One of the two unnamed tributaries to Smith Gully is located north of the proposed Frac-3 and Frac-4 Facility site and the other is located south of the Frac-3 and Frac-4 Facility site (Figure 4, Appendix A). Smith Gully, which begins south of Winfree Street, is a tributary to Cedar Bayou. Cedar Bayou flows into Galveston Bay. The wastewater effluent from the Frac-3 and Frac-4 Facility would be discharged through outfall structures along the unnamed tributaries to Smith Gully located north and south of the Frac-3 and Frac-4 Facility Site (Figures 2 and 3, Appendix A; Photographs 8 through 11, Appendix B).

A portion of the Coastal Water Authority Canal is located in the Action Area northeast of the proposed Frac-3 and Frac-4 Facility site boundary (Figures 2 and 3, Appendix A). The primary purpose of the canal is to provide untreated surface water for use as a municipal water supply to the cities of Houston, Baytown, and Deer Park. Secondly, the Coastal Water Authority Canal provides untreated surface

¹⁰ Historic Averages for Mont Belvieu, Texas, <http://www.intellicast.com/Local/History.aspx?unit=F&location=USTX0908>, Accessed January 6, 2014.

water to industries and agricultural customers. The canal would be the source of water for the proposed Frac-3 and Frac-4 Facility and a new intake structure would be constructed along the southwest bank of the Coastal Water Authority Canal, adjacent to the Frac-3 and Frac-4 Facility.

Buck Gully, Cherry Point Gully, and Old River are within the northeast portion of the Action Area. Buck Gully and Cherry Point Gully are tributaries to Old River. Old River flows southeast towards Old River Lake, which is located north of Trinity Bay.

Based on wetland delineations conducted in 2011 through 2013 on ONEOK property by a wetland scientist from Burns & McDonnell, a palustrine scrub-shrub wetland is presently located on ONEOK property that would be directly affected by construction of the Frac-3 and Frac-4 Facility (Figure 5, Appendix A).

3.4 VEGETATION

A total of four vegetation communities were identified within the Action Area. These vegetation communities include woodland, scrub-shrub, open pasture, and wetlands. Open pastures were the most common vegetation community within the Action Area. Most of the open pastures were crossed by pipeline corridors. The wooded areas and scrub-shrub areas consist of deciduous species.

Common grassy and herbaceous species found within the open pastures included wild garlic (*Allium canadense*), bindweed (*Calystegia* sp.) annual ragweed (*Ambrosia artemisiifolia*), tall fescue (*Schedonorus phoenix*), Canadian rush (*Juncus canadensis*), rough bentgrass (*Agrostis scabra*), American mannagrass (*Glyceria grandis*), annual ragweed (*Ambrosia artemisiifolia*), dwarf palmetto (*Sabal minor*), wrinkleleaf goldenrod (*Solidago rugosa*), mint (*Scutellaria* sp.), woodsorrel (*Oxalis* sp.), Virginia wildrye (*Elymus virginicus*), plantain (*Plantago* sp.), Johnsongrass (*Sorghum halepense*), thistle (*Cirsium* sp.), morning glory (*Ipomoea* sp.), curly dock (*Rumex crispus*), Bermudagrass (*Cynodon dactylon*), Bahiagrass (*Paspalum notatum*), common carpetgrass (*Axonopus fissifolius*), Vasey's grass (*Paspalum urvillei*), nimblewill (*Muhlenbergia schreberi*), prairie broomweed (*Amphiachyris dracunculoides*), late purple aster (*Symphyotrichum patens*), yellow bristle grass (*Setaria pumila*), common chickweed (*Stellaria media*), Carolina geranium (*Geranium carolinianum*), annual bluegrass (*Poa annua*), alsike clover (*Trifolium hybridum*), and northern bedstraw (*Galium boreale*).

Woodlands typically included species such as southern magnolia (*Magnolia grandiflora*), pecan (*Carya illinoensis*), possumhaw (*Ilex decidua*), large gallberry (*Ilex coriacea*), yaupon (*Ilex vomitoria*), wax myrtle (*Morella cerifera*), American elm (*Ulmus Americana*), white ash (*Fraxinus americana*), sweetgum

(*Liquidamber styraciflua*), poison-bean (*Sesbania drummondii*), eastern redbud (*Cercis canadensis*), live oak (*Quercus virginiana*), cottonwood (*Populus deltoides*), and sugarberry (*Celtis laevigata*).

Areas of scrub-shrub included a mix of species from the deciduous woodland areas and open pastures and typically included eastern redcedar (*Juniperus virginiana*), fiveneedle pricklyleaf (*Thymophylla pentachaeta*), blackberry (*Rubus* sp.), Chinese privet (*Ligustrum sinense*), and eastern baccharis (*Baccharis halimifolia*), with a herbaceous layer consisting of garlic (*Allium canadense*), bindweed (*Calystegia* sp.), annual ragweed (*Ambrosia artemisiifolia*), tall fescue, Canadian rush (*Juncus canadensis*), rough bentgrass (*Agrostis scabra*), Rooseveltweed (*Baccharis neglecta*), and American managrass (*Glyceria grandis*).

The vegetation identified in wetland areas and along streams and manmade canals included species such as green bulrush (*Scirpus atrovirens*), Florida paspalum, redtop, bald spikerush, black willow (*Salix nigra*), Chinese tallow (*Triadica sebifera*), threesquare (*Schoenoplectus pungens*), rough-stalk blue grass (*Poa trivialis*), annual marsh-elder (*Iva annua*), broadleaf cattail (*Typha latifolia*), and common rush (*Juncus effusus*).

3.5 SOILS

According to the Natural Resource Conservation Service (“NRCS”) 2004 *Soil Survey of Chambers County, Texas*, and accompanying NRCS Soil Survey Geographic Database (“SSURGO”) digital data, 17 soil series occur within the Action Area (Figure 7, Appendix A).

Anahuac silt loam	Lake Charles clay
Beaumont clay	League clay
Beaumont-urban land complex	Morey silt loam
Bernard-Morey complex	Mocarey-Yeaton complex
Dylan clay	Oil waste
Leton silt loam	Vamont clay
Leton-Anahuac complex	Vamont silty clay
Leton-Morey complex	Bevil silty clay
Gessner loam	

Anahuac silt loam, Morey silt loam (leveled), and Leton silt loam are the soil types located within the footprint of the Frac-3 and Frac-4 Facility. The Anahuac soil series consists of moderately well drained

soils that formed in loamy and clayey alluvial sediments on uplands of Pleistocene Age. Anahuac silt loams have very slow permeability. Leton silt loams are poorly drained soils with slow permeability that formed in loamy alluvial deposits and are saturated in winter and early spring. Morey silt loams are somewhat poorly drained soils that have slow permeability and are found on uplands. According to the 2012 United States Department of Agriculture NRCS *Hydric Soils List*, Anahuac silt loam, Morey silt loam, and Leton silt loam are classified as hydric soils.¹¹

3.6 WILDLIFE OBSERVED

Species identified within the Action Area included Mourning Dove (*Zenaida macroura*), European Starling (*Sturnus vulgaris*), Black Vulture (*Coragyps atratus*), Northern Mockingbird (*Mimus polyglottos*), Great-tailed Grackle (*Quiscalus mexicanus*), Brownheaded Cowbird (*Molothrus ater*), Killdeer (*Charadrius vociferus*), and eastern cottontail (*Sylvilagus floridanus*). Waterfowl species observed along the Coastal Water Authority Canal North of Mont Belvieu included Cattle Egret (*Bubulcus ibis*) and Great Blue Herron (*Ardea herodias*).

¹¹ United States Department of Agriculture, Natural Resources Conservation Services. 2012 *Hydric Soils List*, <http://soils.usda.gov/use/hydric/>, Accessed January 6, 2014.

4.0 IMPACTS ANALYSIS

4.1 LITERATURE REVIEW

Prior to the field survey, a detailed literature review was conducted to gather available information regarding protected and sensitive species that may occur within the Action Area and current information on the potential for air emissions to impact protected and sensitive species and designated critical habitat. The literature review did not identify any published scientific studies on or related to the effects of air emissions like those associated with the Project on sea turtles, the Louisiana black bear, piping plover, red wolf, smalltooth sawfish, Sprague's pipit, or whooping crane.

4.2 NOISE EFFECTS

Construction will cause localized, short-term, and generally minor increases in ambient noise levels in the immediate vicinity of work sites. Construction-related noise will generally stem from construction equipment operation, including but not necessarily limited to truck traffic, earth-moving vehicles and equipment, jackhammers, and structure erection equipment (cranes), etc. The temporary increase in construction-related noise could potentially raise ambient sound levels in the vicinity of the Project. However, construction activities will typically occur during the daytime (between 7:00 a.m. to 7:00 p.m.). Overall, these sound levels are typical of construction projects.

Noise levels during operation of the Frac-3 and Frac-4 Facility will be comparable to noise levels of existing, similar facilities in the area and will comply with Section 14-50 of the Mont Belvieu, Texas, Code of Ordinances (Ord. No. 2006-011, § 1(20-91), 5-22-2006). Operation-related noise levels will not be greater or remarkably different than the noise levels generated by the other existing petrochemical facilities in the area and the sound levels are anticipated to be less than 68 A-weighted decibels ("dB(A)") when measured during either daytime or nighttime hours at ONEOK's property line. The addition of sound levels less than or equal to 68 dB(A) will not add a measurable cumulative impact to the current aggregate noise levels generated by existing petrochemical facilities in the Action Area. Therefore, the noise levels generated by operation of the Frac-3 and Frac-4 Facility will not result in any direct, indirect, or cumulative effects to federally protected species.

4.3 WASTEWATER

No adverse impact to the surface water and receptors within the Action Area is anticipated from wastewater from the OHLP natural gas liquids fractionation plant. EPA Region 6 has determined in the NPDES Permit No. TX0140091 Statement of Basis that the limitations proposed in the NPDES Permit

are adequate to protect human and ecological receptors (Appendix E). Information on the receiving water body, regulatory controls, and institutional controls are described below.

Wastewater and storm water discharged through NPDES Outfalls 001, 002, and 003 eventually enters Cedar Bayou. The outfall structures do not empty directly into Cedar Bayou. The point at which Smith Gulley empties into Cedar Bayou is approximately 14.2 river miles upstream from Trinity Bay. The designated uses of Cedar Bayou (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) are contact recreation and high aquatic life. The general criteria and numerical criteria which make up the stream standards are provided in the Texas Administrative Code (“TAC”), 30 TAC Sections 307 and as shown below.

Table 4-1 Applicable Stream Standards for Cedar Bayou Tidal, Waterbody Segment Code No. 0901 of the Trinity- San Jacinto Coastal Basin

Parameter	Criteria
Dissolved Oxygen	4 milligrams per liter (“mg/L”)
pH Range	6.5 – 9.0 S.U.
Indicator Bacteria	35 per 100 milliliter
Temperature	95 °F

Effluent from the Facility will comply with published water quality criteria for the receiving water body. The effluent from the Facility is not expected to affect the temperature or dissolved oxygen content of Cedar Bayou. The effluent will flow along approximately 2.9 miles of the unnamed ditch tributary and approximately 2.5 miles along Smith Gully and will reach ambient temperatures and dissolved oxygen levels comparable to other natural streams in the area before reaching Cedar Bayou. The pH range of the effluent from Outfall 001, 002, and 003 will be between 6.5 and 9.0 S.U., which falls within the applicable stream standards for Cedar Bayou. The chemical concentrations in the effluent are not anticipated to result in bacteria loading or algae blooms in Cedar Bayou. The effluent concentration of ammonia (as nitrogen) and phosphorus is not expected to exceed 1.4 mg/L and 5.1 mg/L, respectively, in all NPDES Outfalls. No degradation of the designated uses of Cedar Bayou (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) is anticipated.

Cedar Bayou is listed as impaired for bacteria (Category 5c), dioxin in edible tissue (Category 5a), and Polychlorinated Biphenyls (“PCBs”) in edible tissue (Category 5a) in the 2010 State of Texas 303(d) List for Assessed River/Stream Reaches Requiring Total Maximum Daily Loads (“TMDLs”). These impairments are under TCEQ’s category 5a and 5c. Category 5a designates that a TMDL is underway,

scheduled, or will be scheduled while Category 5c designates that additional data and information will be collected before a TMDL is scheduled. The facility does not discharge bacteria, dioxin, and PCBs. Thus, the Facility will not result in greater impairment of Cedar Bayou.

Wastewater effluent from the Facility will comply with Federal and State water quality regulations. The Federal government established the NPDES permit program to achieve “water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water;” more commonly known as the “swimmable, fishable” goal. Texas Water Quality Standards (“TWQS”) found at 30 TAC Chapter 307 state that “surface waters will not be toxic to man from ingestion of water, consumption of aquatic organisms, or contact with the skin, or to terrestrial or aquatic life.” The methodology outlined in the “Procedures to Implement the Texas Surface Water Quality Standards” (“IP”) is designed to ensure that no source will be allowed to discharge any wastewater which: (1) results in in-stream aquatic toxicity; (2) causes a violation of an applicable narrative or numerical state water quality standard; (3) results in the endangerment of a drinking water supply; or (4) results in aquatic bioaccumulation which threatens human health. Compliance with both Federal and State requirements, incorporated into the NPDES Permit, ensures that wastewater will have no adverse impact to the surface water within the Action Area.

Procedural and engineering controls will be implemented by the Facility to manage short- and long-term environmental liabilities related to wastewater. Best management practices will be incorporated to reduce the potential release of any oil, grease, or related residue that could produce a visible film or globules of grease on the water’s surface or coat the banks or bottoms of the watercourse; or cause toxicity to man, aquatic life, or terrestrial life. Practices include off-site disposal of water that contacts hydrocarbons, secondary containment, and spill response and containment procedures. In addition, pre-treatment of effluent to manage residual chlorine within NPDES limits are proposed. The proposed controls provide an additional layer of protection beyond compliance with regulatory effluent limits.

The wastewater will have no adverse impact upon threatened or endangered species or potential threatened or endangered species habitat within the Action Area. This finding of no adverse impact is based upon (1) effluent from the Facility will comply with published water quality criteria for the receiving water body, (2) compliance with State and Federal regulatory requirements, and (3) the implementation of procedural and engineering controls to reduce the potential for the release of pollutants. This determination is consistent with the EPA’s conclusions stated in the NPDES Permit No. TX0140091 Statement of Basis, in which the EPA has determined that the wastewater quality from the

OHLP fractionation facility will not have any adverse impacts upon threatened or endangered species (Appendix E).

4.4 FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES

4.4.1 Sea Turtles

No habitat with the potential to support sea turtles (green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle) was observed at the proposed Frac-3 and Frac-4 Facility site or within the Action Area. Similarly, no critical habitat for sea turtles has been designated in the Action Area or in Chambers County. Dutton Lake and Trinity Bay, which are located approximately 6.5 miles and 8 miles to the southeast of the proposed Frac-3 and Frac-4 Facility site, respectively, are the nearest aquatic habitats where sea turtles could potentially occur. Neither Trinity Bay nor Dutton Lake was within the Action Area.

Kemp's ridley sea turtles and loggerhead sea turtles have been observed depositing their eggs on the beaches of Bolivar Peninsula; however, no other sea turtle species have been recently observed depositing eggs there (Coyne, 2014). The proposed Frac-3 and Frac-4 Facility site is approximately 30 miles from the Bolivar Peninsula and would not affect the beach habitat or the sea turtles that choose to deposit their eggs on the beaches of the Bolivar Peninsula. Additionally, the quality of nesting habitat along Bolivar Peninsula and Galveston Island has been compromised by a lack of dunes, extensive debris fields, and beach erosion that resulted from Hurricane Ike in September 2008 (Coyne, 2014). The proposed Frac-3 and Frac-4 Facility will not affect the natural recovery of the beach or ongoing restoration activities occurring along the shores of Bolivar Peninsula where sea turtles are known to deposit their eggs.

Sea turtles will not be directly or indirectly impacted by the proposed Frac-3 and Frac-4 Facility. The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas and petroleum pipelines and pumpjacks), and petrochemical facilities.

The wastewater discharge from the Facility will have no adverse impact upon threatened or endangered sea turtle species because the wastewater effluent quality will be better than published TWQS, the Facility's wastewater discharge will comply with State and Federal regulatory requirements, and OHLP will implement EPA-approved procedural and engineering controls to reduce the potential for the release of pollutants. Many of the threats to listed threatened or endangered turtle species are related to activities in coastal areas. Those coastal threats include: poaching of turtles and eggs, development and human

encroachment of nesting beaches, erosion of beaches, vehicular traffic on beaches, beach armoring, artificial lighting, mechanical beach cleaning, marina and dock development, coastal development, increased human presence, dredging, non-native vegetation, sea grass bed degradation, agricultural pollution, and entanglement in nets at sea. The authorized discharges by the Facility will not affect those threats to threatened or endangered turtle species.

Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on the green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, or loggerhead sea turtle because of the limited scope of the proposed construction and operation of the Frac-3 and Frac-4 Facility in an already heavily industrialized area, the nature and relatively low levels of additional noise, emissions and discharged waste water from the proposed facility, and the lack of potential sea turtle habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility.

4.4.2 Louisiana Black Bear

The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway. The Action Area did not contain any areas of large contiguous bottomland hardwood forests, mixed forests, or brackish and freshwater marshes of the type that the Louisiana black bear typically inhabits. Considering the limited scope of the proposed construction and operation of the Facility, and the lack of Louisiana black bear habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility would have “no effect” on the Louisiana black bear.

4.4.3 Piping Plover

The piping plover migrates through Texas each spring and fall, wintering along the Gulf Coast. This species typically migrates in early spring, reaching its prairie breeding grounds in early May. Historically, this species bred along the Atlantic Coast, the Great Lakes, and along the major rivers and streams within the Great Plains of North America (Elliott-Smith and Haig, 2004). Development along and recreational uses of beaches and the channelization and damming of rivers have reduced the amount of beach and sandbar nesting and wintering habitat along major streams and coastal areas, causing the decline of the piping plover.

Chambers County and the proposed Frac-3 and Frac-4 Facility site are situated within the migratory pathway between breeding grounds and wintering habitats. However, piping plovers are not known to occur within the Action Area, according to Texas Natural Diversity Database records, although critical

habitat for piping plovers is present on Bolivar Peninsula on Galveston Bay (in Galveston County) approximately 33 miles south of the proposed Frac-3 and Frac-4 Facility.

The proposed Frac-3 and Frac-4 Facility site and the surrounding Action Area in Mont Belvieu do not provide suitable loafing and foraging habitat for migrating piping plovers or suitable wintering habitat (e.g., bare or sparsely vegetated beaches, salt marshes, emergent seagrass beds, mudflats, or sandbars). The proposed Frac-3 and Frac-4 Facility is located in a previously disturbed area that is under construction for the Frac-3 and Frac-4 Facility. (Figure 2, Appendix A). The surrounding Action Area includes existing above- and below-ground pipeline transmission corridors, below ground hydrocarbon storage, petroleum wells and pumpjacks, petrochemical facilities, pastures, residential neighborhoods, public road corridors, and retail and commercial establishments. The proposed Frac-3 and Frac-4 Facility and the surrounding action area do not possess any habitats that would attract the piping plover. The two unnamed tributaries to Smith Gully and the Coastal Water Authority Canal do not have suitable beach or sandbar habitats; thus, piping plovers would not be attracted to the Action Area.

The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas, natural gas liquids, and/or petroleum pipelines, storage and pumpjacks), and petrochemical facilities. Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on the piping plover because of the limited scope of the proposed construction and operation of the Frac-3 and Frac-4 Facility in an already heavily industrialized area, the nature and relatively low levels of noise, emissions and discharged water that would result from operation of the proposed Frac-3 and Frac-4 Facility, and the lack of potential piping plover habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility.

4.4.4 Red Wolf

The red wolf is thought to be extirpated from the state of Texas and is currently only found in the states of North and South Carolina (NatureServe, 2013). The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas and petroleum pipelines and pumpjacks), and petrochemical facilities. Considering the limited scope of the proposed construction and operation of the Frac-3 and Frac-4 Facility, and the lack of the red wolf within the vicinity of the proposed Frac-3 and Frac-4 Facility, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on the red wolf.

4.4.5 Smalltooth Sawfish

No habitat with the potential to support the smalltooth sawfish was observed at the proposed Frac-3 and Frac-4 Facility site or within the Action Area. Similarly, no critical habitat for smalltooth sawfish has been designated in the Action Area. Dutton Lake and Trinity Bay, which are located approximately 6.5 miles and 8 miles to the southeast of the proposed Frac-3 and Frac-4 Facility site, respectively, are the nearest aquatic habitats where smalltooth sawfish could potentially occur. Neither Trinity Bay nor Dutton Lake is within the Action Area. Although the range of this fish extends all throughout the Gulf of Mexico, currently the only known populations exist along the Florida peninsula.

The proposed Frac-3 and Frac-4 Facility would be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas and petroleum pipelines and pumpjacks), and petrochemical facilities. Discharged wastewater from the Facility will not affect the smalltooth sawfish because the wastewater effluent quality will be better than published TWQS, the Facility's wastewater discharge will comply with State and Federal regulatory requirements, and OHLP will implement EPA-approved procedural and engineering controls to reduce the potential for the release of pollutants. Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have "no effect" on the smalltooth sawfish because of the limited scope of the proposed construction and operation of the Frac-3 and Frac-4 Facility in an already heavily industrialized area, the nature and relatively low levels of noise, emissions and discharged water that would result from operation of the facility, and the lack of potential smalltooth sawfish habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility.

4.4.6 Whooping Crane

The Frac-3 and Frac-4 Facility site occurs outside of the migration corridor for the Aransas-Wood Buffalo Breeding population of whooping crane (U.S. Fish and Wildlife Service, 2009). Historic and current occurrence data indicate that the main migration corridor for the whooping crane occurs west of the City of Houston. The proposed Frac-3 and Frac-4 Facility site and the surrounding Action Area, which occurs within the City of Mont Belvieu, also does not provide suitable loafing and foraging habitat (e.g., brackish bays, marshes, salt flats, and crop fields). The wetlands that are located within the Action Area are relatively small, resulted from development and alterations in natural drainage patterns, and occur within an industrial section of the City of Mont Belvieu. The proposed Frac-3 and Frac-4 Facility and the surrounding Action Area do not possess any habitats that would attract whooping cranes. The whooping crane is not expected to occur within the Action Area because of the amount of existing development and proximity to regular human disturbances; therefore, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility would have "no effect" on the whooping crane.

4.5 FEDERALLY LISTED CANDIDATE SPECIES

4.5.1 Sprague's pipit

The Sprague's pipit migrates through Texas each spring and fall, wintering in suitable areas within Texas. This species typically migrates in early spring, reaching its prairie breeding grounds in early April. This species' primary breeding ground is the Northern Great Plains and into southern Canadian territories. Development within the Northern Great Plains has caused declines in Sprague's pipit due to habitat loss, degradation, and fragmentation.

Chambers County and the proposed Frac-3 and Frac-4 Facility site are situated within the migratory pathway between breeding grounds and wintering habitats. Although potential habitat for Sprague's pipit may be present in Chambers County, the Action Area consists of disturbed areas with woody encroachment replacing the mixed grasses preferred by Sprague's pipit. The proposed Frac-3 and Frac-4 Facility site and the surrounding Action Area in Mont Belvieu do not provide suitable loafing and foraging habitat for migrating Sprague's pipit or suitable wintering habitat (e.g., short to mid-grass plains and little woody vegetation or shrub habitat).

4.6 CRITICAL HABITAT

According to the FWS, no critical habitat has been designated within the Action Area or in Chambers Counties; thus, no critical habitat will be affected by the proposed Frac-3 and Frac-4 Facility.

4.7 SENSITIVE SPECIES AND SPECIES OF CONCERN

4.7.1 Bald Eagle

The bald eagle is a species that has been removed from the list of threatened and endangered species under the Endangered Species Act but still remains protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Both laws prohibit harming the nests or eggs of the bald eagle. The proposed Frac-3 and Frac-4 Facility was evaluated within the context of the National Bald Eagle Management Guidelines (U.S. Fish and Wildlife Service, 2007a) to determine if any impact to the bald eagle or potential bald eagle roosting and nesting habitats may occur within the Action Area.

The bald eagle is a year-round resident along the Gulf Coast of Texas. This species nests in large trees along the coast and major rivers and streams within Texas. Development and recreational use have reduced the amount of potential nesting and roosting habitat along major streams and coastal areas. The proposed Frac-3 and Frac-4 Facility site and Action Area in Mont Belvieu do not provide suitable nesting, foraging, or roosting habitat for bald eagles (e.g., very tall trees or snags along large rivers, lakes, and reservoirs with open water, large concentrations of waterfowl, and limited human activity). Due to the

amount of existing residential, commercial and industrial development within the Action Area, bald eagles are not likely to be attracted to the area and are unlikely to occur at the proposed Frac-3 and Frac-4 Facility site or within the Action Area. Additionally, no raptor stick nests were observed within the Action Area during the habitat field surveys. The nesting bald eagles that were sighted along Trinity River, approximately 8 miles to the east of the proposed Frac-3 and Frac-4 Facility, were last observed in 1996. Any bald eagles that would return to that nesting site would likely remain within the swamps and marshes along the Trinity River and avoid the city of Mont Belvieu and surrounding areas occupied by humans within the Action Area.

The bald eagle will not be directly or indirectly impacted by construction activities, air emissions, or human disturbance associated with the proposed Frac-3 and Frac-4 Facility. The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas and petroleum pipelines and pumpjacks), and petrochemical facilities. Considering the scope of the proposed construction, the lack of potential bald eagle habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility, and the relatively minimal emissions impacts (modeled) that will result from operation of the proposed Frac-3 and Frac-4 Facility, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on the bald eagle.

4.7.2 Marine Mammals

No habitat with the potential to support marine mammals was observed at the proposed Frac-3 and Frac-4 Facility site or within the Action Area. Similarly, no critical habitat for marine mammals has been designated in the Action Area or in Chambers County. Although historic strandings of marine mammals have occurred along Bolivar Peninsula in Galveston County, the proposed Frac-3 and Frac-4 Facility site is approximately 30 miles from the Bolivar Peninsula and will not affect marine habitats in Galveston Bay or the Gulf of Mexico. Dutton Lake and Trinity Bay, which are located approximately 6.5 miles and 8 miles to the southeast of the proposed Frac-3 and Frac-4 Facility site, respectively, are the nearest aquatic habitats where marine mammals could potentially occur. Neither Trinity Bay nor Dutton Lake were within the Action Area, nor will either water body expected to be directly or indirectly impacted by the proposed Frac-3 and Frac-4 Facility.

Marine mammals will not be directly or indirectly impacted by construction activities, air emissions, or human disturbance associated with the proposed Frac-3 and Frac-4 Facility. The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for

petroleum production (natural gas, natural gas liquids and/or petroleum pipelines, storage and pumpjacks), and petrochemical facilities. Considering the scope of the proposed construction, the lack of potential marine mammal habitat within the vicinity of the proposed Frac-3 and Frac-4 Facility, and the relatively minimal emissions impacts (modeled) that will result from operation of the proposed Frac-3 and Frac-4 Facility, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on marine mammals.

4.7.3 Migratory Birds

With the exception of the European Starlings, all of the bird species identified during the habitat assessment field survey (refer to Section 4.5) receive protection under the Migratory Bird Treaty Act. This law governs the taking of migratory birds, their eggs, parts, and nests. All of the bird species identified within the Action Area during habitat assessment field surveys are relatively common species that are tolerant of human interactions and can capitalize on the waste generated by humans (European Starlings, Great-tailed Grackle, and Black Vulture) or are attracted to human development and its lack of natural predators (e.g., Mourning Dove, Killdeer, Great Blue Heron). The previously disturbed nature of the proposed Frac-3 and Frac-4 Facility site, lack of wooded areas on site, and its location within an industrial part of the City of Mont Belvieu, limits the species of birds that would choose to nest within the proposed Frac-3 and Frac-4 Facility footprint to common bird species that are tolerant of regular and repeated disruptions caused by humans. For example, ground-nesting birds that are tolerant of human interactions, such as the Killdeer, may benefit from the large nonvegetated areas associated with the proposed Frac-3 and Frac-4 Facility and the displacement of potential predatory snakes and small mammals that could interfere with the Killdeer’s nesting success.

It is expected that nesting migratory birds will not be directly or indirectly impacted by construction activities, air emissions, or human disturbance associated with the proposed Frac-3 and Frac-4 Facility. The proposed Frac-3 and Frac-4 Facility will be constructed within an area that has been previously disturbed in an existing industrial section of the City of Mont Belvieu and adjacent to an existing highway, areas used for petroleum production (natural gas, natural gas liquids and/or petroleum pipelines, storage and pumpjacks), and petrochemical facilities. Considering the scope of the proposed construction, the lack of potential migratory bird habitat at the proposed Frac-3 and Frac-4 Facility site and within the Action Area, and the relatively minimal emissions impacts (modeled) that would result from operation of the proposed Frac-3 and Frac-4 Facility, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility would have “no effect” on the migratory birds.

4.7.4 Essential Fish Habitat

According to NOAA, no essential fish habitat is located within the Action Area.¹² The nearest mapped essential fish habitat is located within the Cedar Bayou, south of State Highway 146, in Baytown. The two unnamed tributaries to Smith Gully do not contain enough permanently flowing water and are not close enough to Trinity Bay for them to provide adequate spawning habitat and foraging habitat for managed marine fishery species. The Coastal Water Authority Canal also does not provide essential marine fish habitat. The primary purpose of the canal is to provide untreated surface water for use as a municipal water supply to the cities of Houston, Baytown, and Deer Park. Secondly, the Coastal Water Authority Canal provides untreated surface water to industries and agricultural customers. Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on managed marine fishery species protected by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 because no essential fish habitat for managed marine fish species within the Action Area and the wastewater discharged by the Facility is not expected to have an impact to off-property water quality.

¹² National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Essential Fish Habitat Mapper. <http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html>. Accessed January 6, 2014.

5.0 CONCLUSIONS AND DETERMINATION

Construction and operation of the proposed Frac-3 and Frac-4 Facility will not result in any direct, indirect, or cumulative impacts to the federally listed species known or likely to occur within Chambers County. Similarly, construction and operation of the proposed Frac-3 and Frac-4 Facility will not result in the incidental take or mortality of any federally protected species or the loss of designated critical habitat. The proposed Frac-3 and Frac-4 Facility, which is located on a previously disturbed and developed parcel of property in the City of Mont Belvieu, will not result in the loss of habitat, fragmentation of habitat, or increased predation of any of the federally listed species. The construction and operation of the proposed Frac-3 and Frac-4 Facility will not cause a significant increase in the need for additional infrastructure or induce any growth of Mont Belvieu that could result in direct, indirect, or cumulative impacts to federally protected resources. The areas surrounding the proposed Frac-3 and Frac-4 Facility consist of previously disturbed and developed areas and do not include adjacent habitats that are used by federally protected species.

5.1 DETERMINATION OF EFFECT

Considering the limited scope of the proposed Frac-3 and Frac-4 Facility, the nature and relatively low levels of noise, emissions and discharged water that will result from operation of the proposed Frac-3 and Frac-4 Facility, the already heavily industrialized nature of the area within the City of Mont Belvieu where the proposed Frac-3 and Frac-4 Facility is located, and the lack of potential protected species habitat at the proposed Frac-3 and Frac-4 Facility site and within the Action Area, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have “no effect” on the green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, Louisiana black bear, piping plover, red wolf, smalltooth sawfish, and whooping crane (Table 5-1). Similarly, Burns & McDonnell has determined that the proposed Frac-3 and Frac-4 Facility will have no effect on the bald eagle, marine mammals, migratory birds, or essential fish habitat used by managed marine fishery populations.

Table 5-1 Effects on Protected Species Known or Likely to Occur within Chambers County

Common Name	Scientific Name	Federal Status	Critical Habitat Designated in Chambers County	Effect Determination
Green Sea Turtle	<i>Chelonia mydas</i>	Threatened	No	No Effect
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	Endangered	No	No Effect
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	Endangered	No	No Effect
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Endangered	No	No Effect
Loggerhead Sea Turtle	<i>Caretta caretta</i>	Threatened	No	No Effect
Louisiana Black Bear	<i>Ursus americanus luteolus</i>	Threatened	No	No Effect
Piping Plover	<i>Charadrius melodus</i>	Threatened	No	No Effect
Red Wolf	<i>Canis rufus</i>	Endangered	No	No Effect
Smalltooth Sawfish	<i>Pristis pectinata</i>	Endangered	No	No Effect
Whooping Crane	<i>Grus americana</i>	Endangered	No	No Effect

5.2 INTERDEPENDENT AND INTERRELATED ACTIONS

The proposed Frac-3 and Frac-4 Facility is an expansion project to the Mont Belvieu Natural Gas Liquids Fractionation Facility, initiated in 2011 by OHLP in Mont Belvieu, Chambers County, Texas. No additional interdependent or interrelated actions are needed, proposed for, or will result from the construction or operation of the Frac-3 and Frac-4 Facility.

5.3 CUMULATIVE EFFECTS

The proposed Frac-3 and Frac-4 Facility is located within an industrial area in Mont Belvieu that has historically been and is currently used for petroleum production (natural gas, natural gas liquids and/or petroleum pipelines, storage and pumpjacks) and is the location of several existing, operational petrochemical facilities. The prior construction, operation, and facility expansion of the already-existing industrial facilities in the area has likely cumulatively affected the terrestrial and aquatic habitats in the vicinity of the proposed Frac-3 and Frac-4 Facility site and surrounding area. However, past construction, and current operations in the area are unlikely to have affected species protected by the Endangered Species Act. The area is experiencing industrial development as existing industrial facilities are built, reconfigured, and upgraded. Future new facilities may have the potential to impact federally-protected species; however, OHLP is not aware of any other specific proposed development projects within the vicinity of the proposed Frac-3 and Frac-4 Facility that could result in cumulative effects that would negatively impact any of the species considered in this Biological Assessment.

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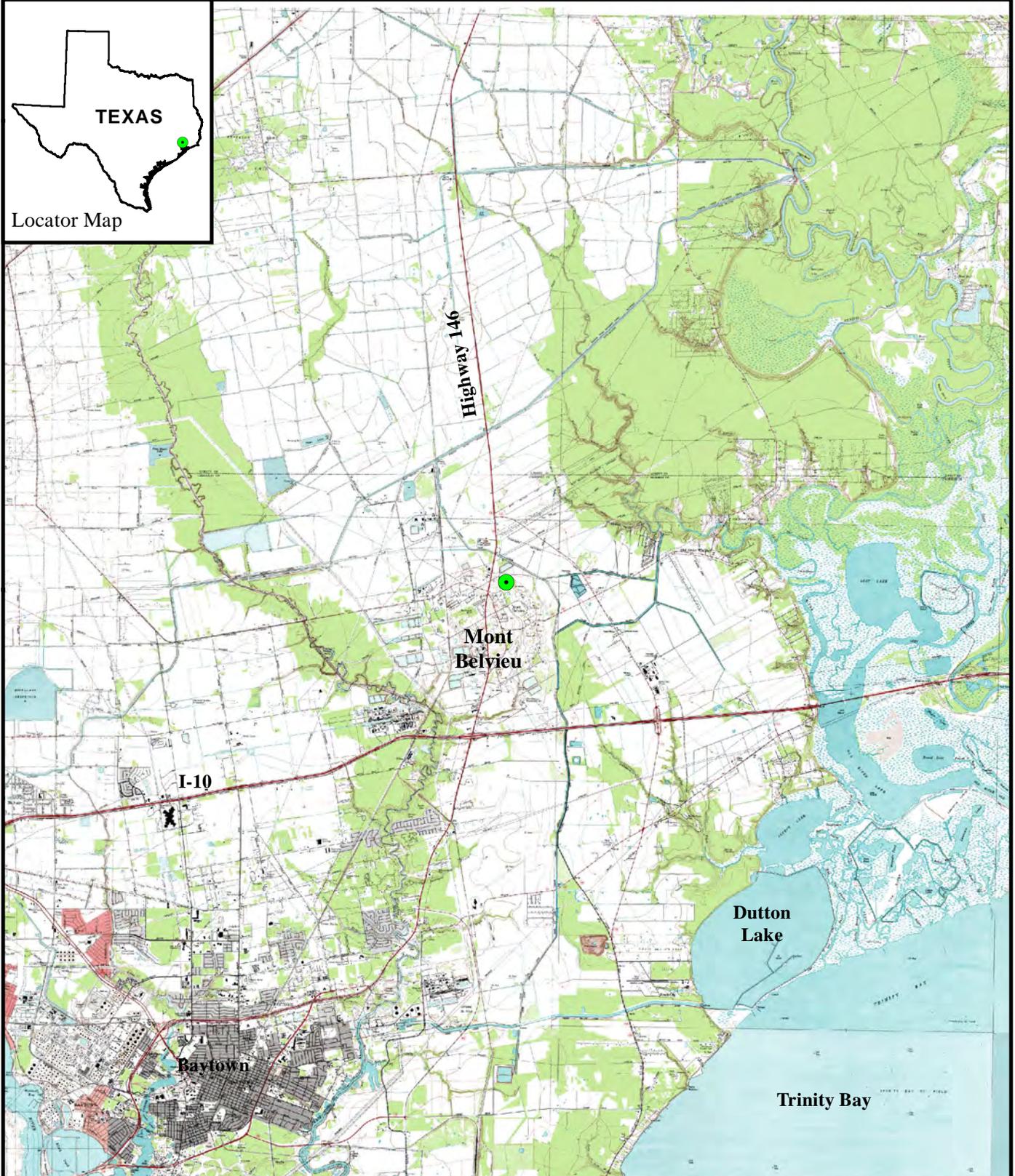
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APPENDIX A - FIGURES



Locator Map



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Facility Location



Figure 1
Site Location Map
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Plant
Chambers County, Texas

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- Project Facility Footprint
- Emission Point
- Intake Structure
- Discharge Point

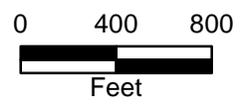


Figure 2
Project Facility Footprint
Aerial Photograph
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

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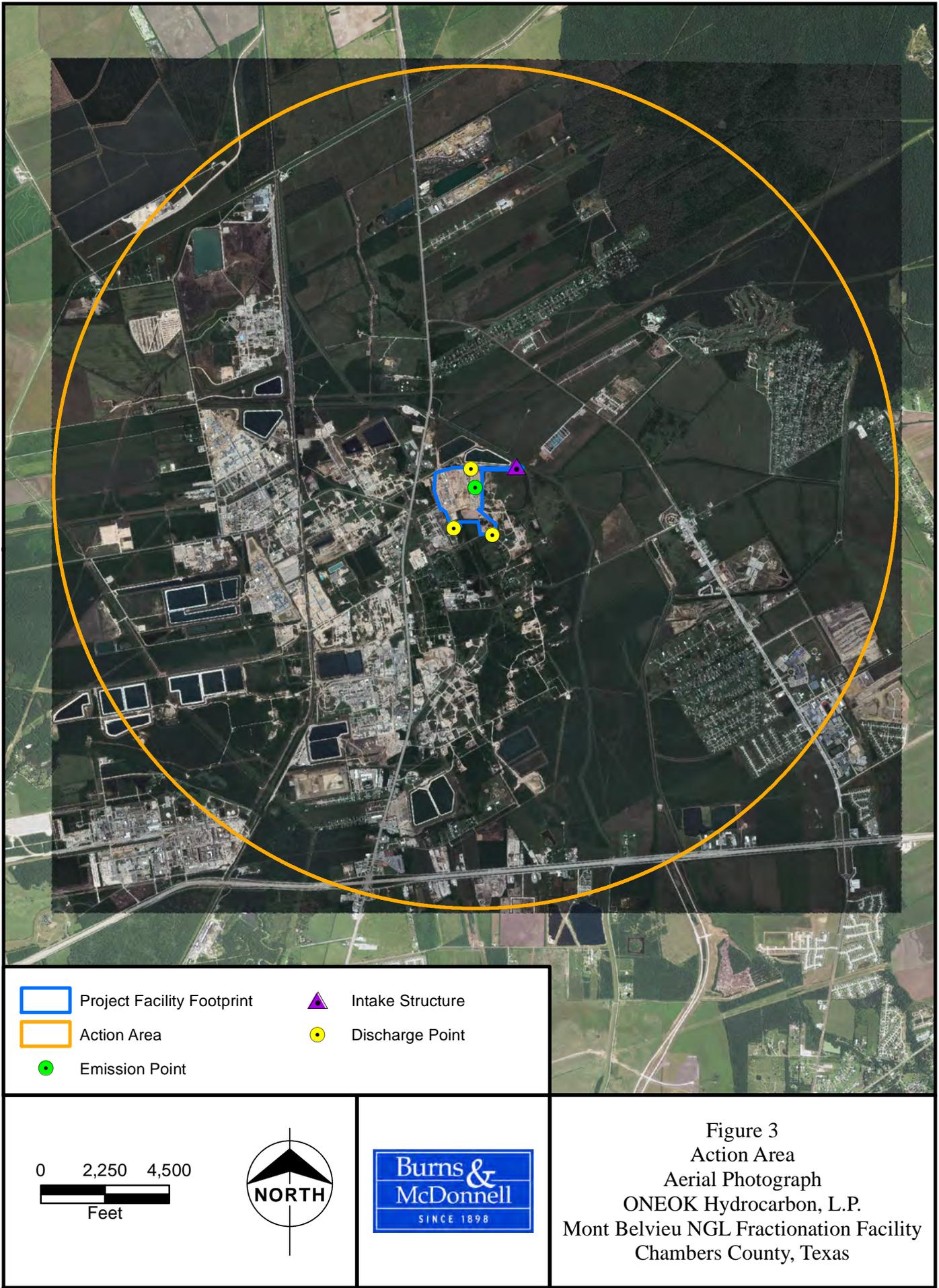
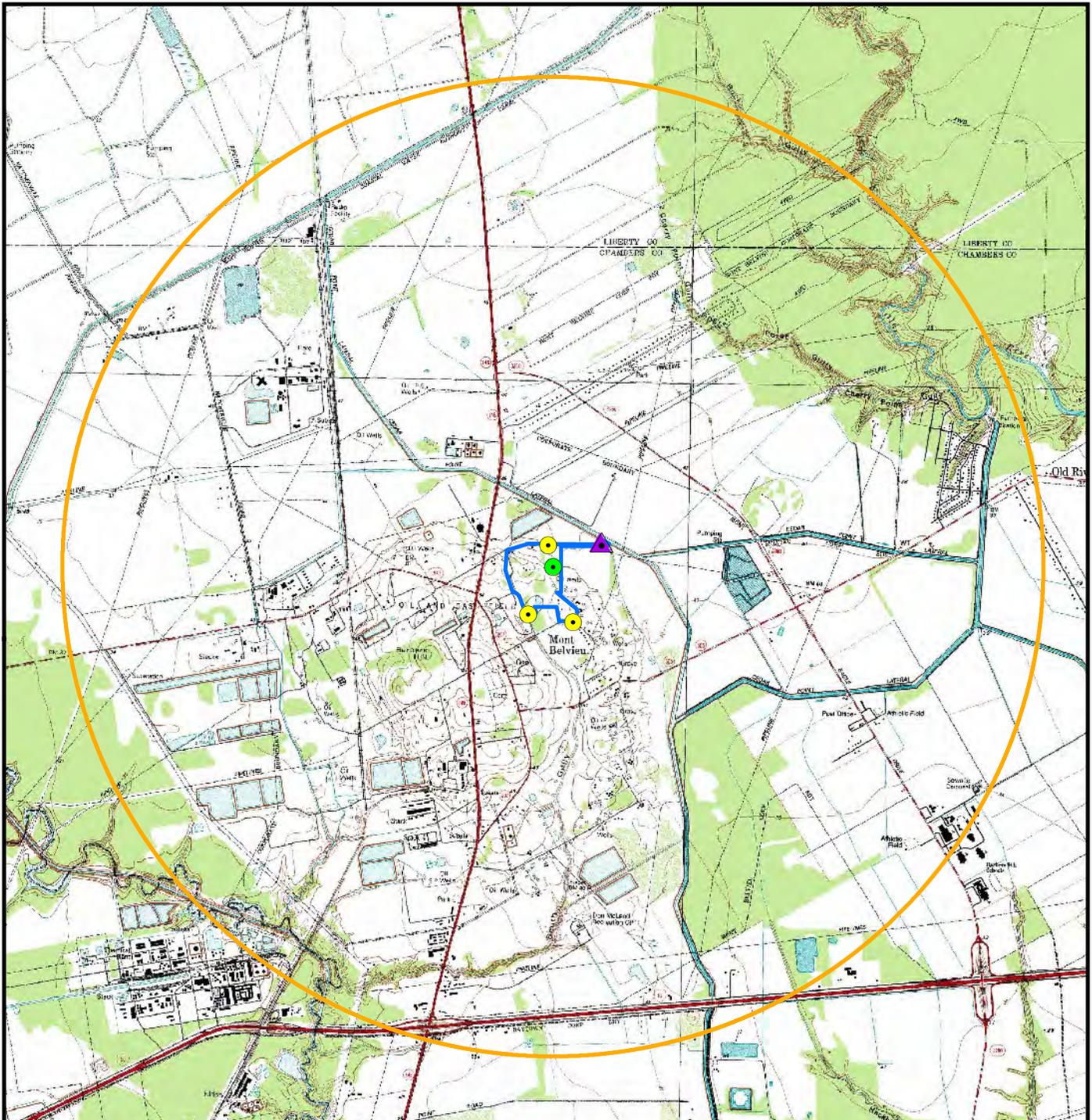


Figure 3
Action Area
Aerial Photograph
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

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	Project Facility Footprint		Intake Structure
	Action Area		Discharge Point
	Emission Point		

0 2,250 4,500
Feet




Figure 4
Action Area
Topographic Map
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

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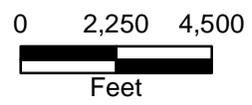
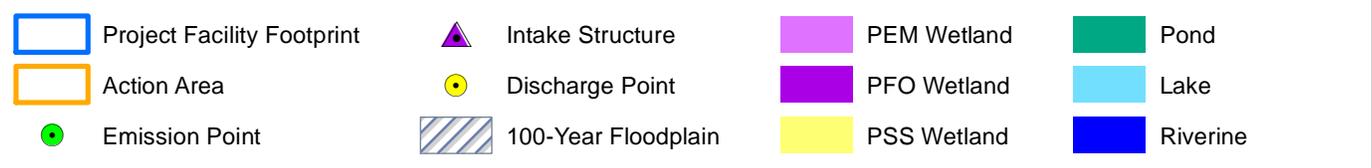
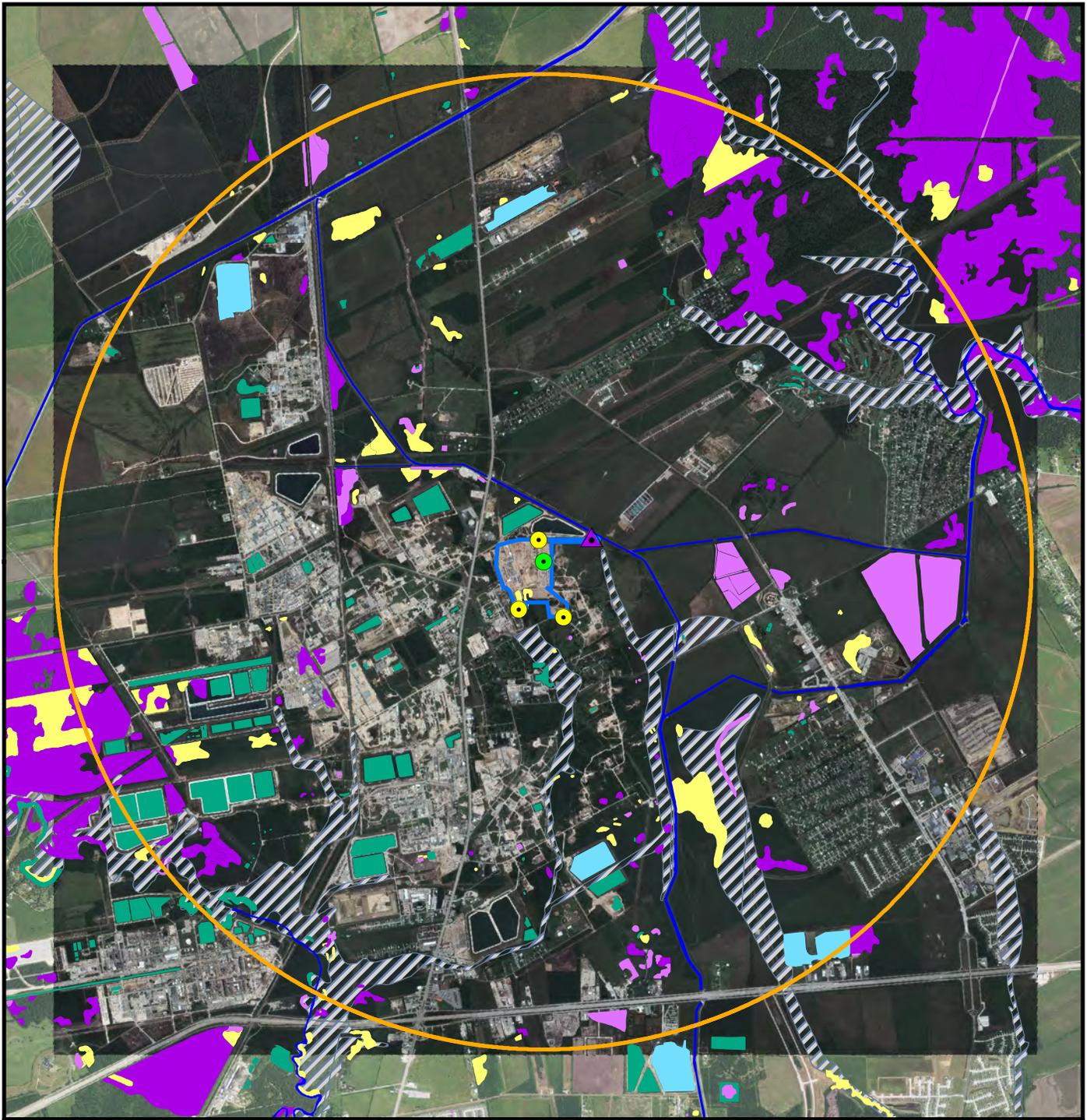
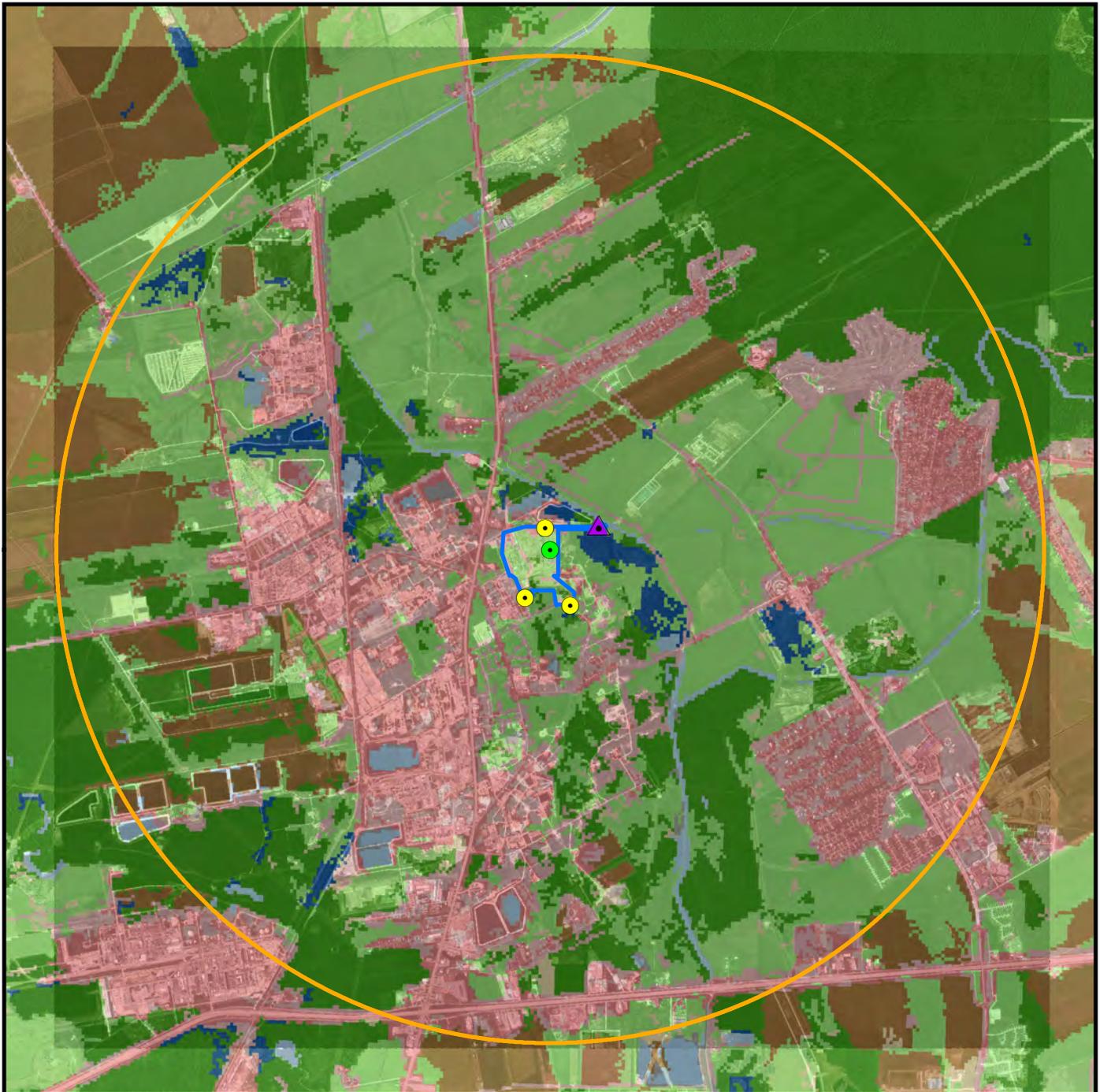


Figure 5
 Action Area
 FEMA & NWI
 ONEOK Hydrocarbon, L.P.
 Mont Belvieu NGL Fractionation Facility
 Chambers County, Texas

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Project Facility Footprint	Discharge Point	Developed	Pasture/Grassland
Action Area	Land Use Type	Barren	Cropland
Emission Point	Open Water	Woodland	Emergent Wetland
Intake Structure	Developed Open Space	Shrub-Scrub	

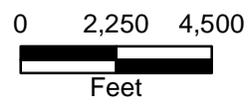
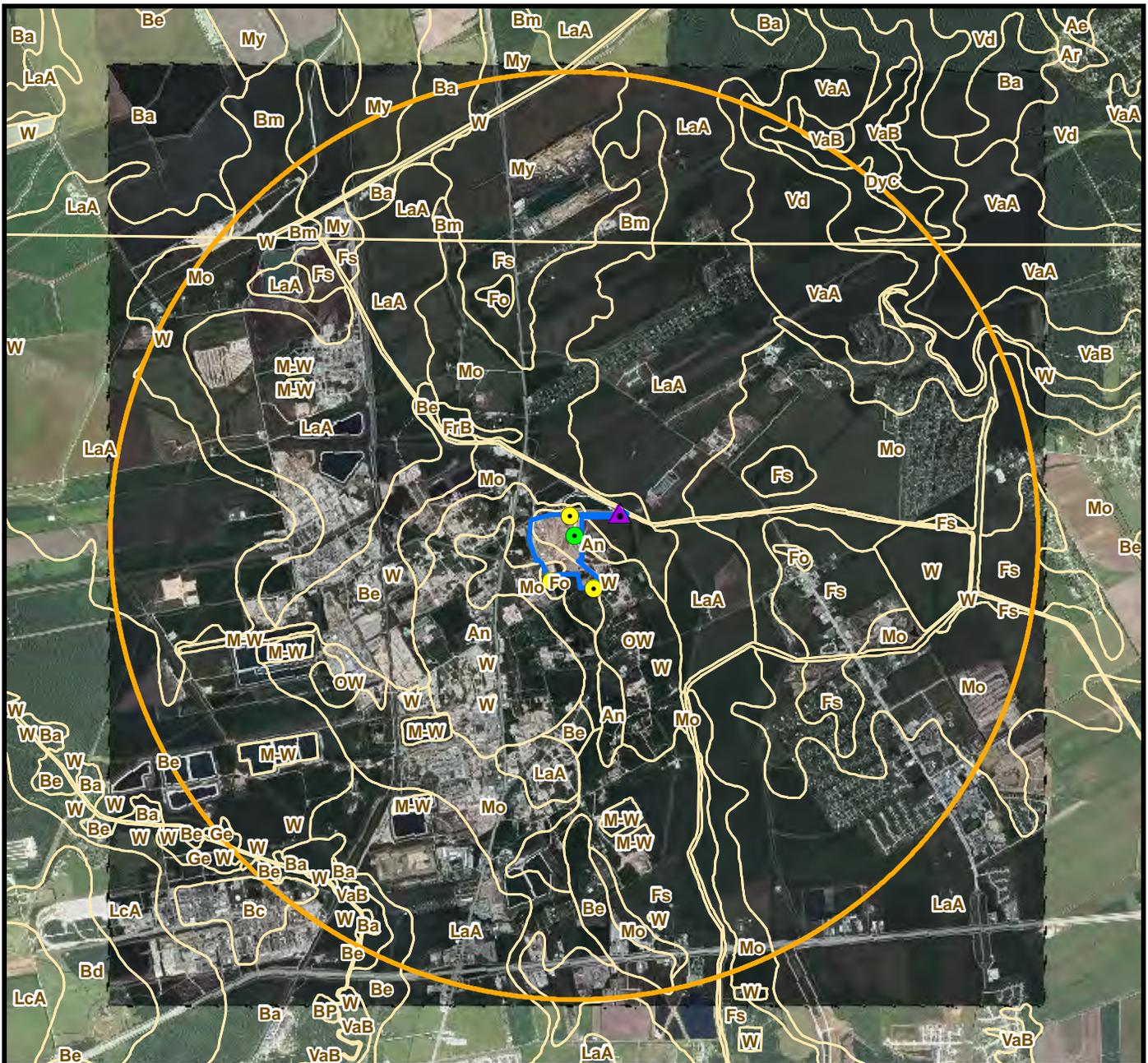


Figure 6
Action Area
Land Use
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas



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<ul style="list-style-type: none">  Project Facility Footprint  Action Area  Emission Point  Intake Structure  Discharge Point  Soil Map Units 	<p>Soil Types</p> <table border="0"> <tr><td>An</td><td>Anahuac silt loam</td><td>M-W</td><td>Miscellaneous water</td></tr> <tr><td>Ba</td><td>Beaumont clay</td><td>Mo</td><td>Morey silt loam, levelled</td></tr> <tr><td>Bc</td><td>Beaumont-Urban land complex</td><td>My</td><td>Mocarey-Yeaton complex</td></tr> <tr><td>Be</td><td>Beaumont clay</td><td>OW</td><td>Oil waste</td></tr> <tr><td>Bm</td><td>Bernard-Morey complex</td><td>VaA</td><td>Vamont clay, 0 to 1 percent slopes</td></tr> <tr><td>DyC</td><td>Dylan clay, 3 to 6 percent slopes</td><td>VaA</td><td>Vamont silty clay, 0 to 1 percent slopes</td></tr> <tr><td>Fo</td><td>Leton silt loam</td><td>VaB</td><td>Vamont clay, 1 to 3 percent slopes</td></tr> <tr><td>FrB</td><td>Leton-Anahuac complex, undulating</td><td>VaB</td><td>Vamont clay, 1 to 5 percent slopes</td></tr> <tr><td>Fs</td><td>Leton-Morey complex, levelled</td><td>Vd</td><td>Bevil silty clay, depressional</td></tr> <tr><td>Ge</td><td>Gessner loam</td><td>W</td><td>Water</td></tr> <tr><td>LaA</td><td>Lake Charles clay, 0 to 1 percent slopes</td><td>W</td><td>Water (greater than 40 acres in size)</td></tr> <tr><td>LaA</td><td>League clay, 0 to 1 percent slopes</td><td></td><td></td></tr> </table>	An	Anahuac silt loam	M-W	Miscellaneous water	Ba	Beaumont clay	Mo	Morey silt loam, levelled	Bc	Beaumont-Urban land complex	My	Mocarey-Yeaton complex	Be	Beaumont clay	OW	Oil waste	Bm	Bernard-Morey complex	VaA	Vamont clay, 0 to 1 percent slopes	DyC	Dylan clay, 3 to 6 percent slopes	VaA	Vamont silty clay, 0 to 1 percent slopes	Fo	Leton silt loam	VaB	Vamont clay, 1 to 3 percent slopes	FrB	Leton-Anahuac complex, undulating	VaB	Vamont clay, 1 to 5 percent slopes	Fs	Leton-Morey complex, levelled	Vd	Bevil silty clay, depressional	Ge	Gessner loam	W	Water	LaA	Lake Charles clay, 0 to 1 percent slopes	W	Water (greater than 40 acres in size)	LaA	League clay, 0 to 1 percent slopes		
An	Anahuac silt loam	M-W	Miscellaneous water																																														
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Bm	Bernard-Morey complex	VaA	Vamont clay, 0 to 1 percent slopes																																														
DyC	Dylan clay, 3 to 6 percent slopes	VaA	Vamont silty clay, 0 to 1 percent slopes																																														
Fo	Leton silt loam	VaB	Vamont clay, 1 to 3 percent slopes																																														
FrB	Leton-Anahuac complex, undulating	VaB	Vamont clay, 1 to 5 percent slopes																																														
Fs	Leton-Morey complex, levelled	Vd	Bevil silty clay, depressional																																														
Ge	Gessner loam	W	Water																																														
LaA	Lake Charles clay, 0 to 1 percent slopes	W	Water (greater than 40 acres in size)																																														
LaA	League clay, 0 to 1 percent slopes																																																

<p>0 2,500 5,000 Feet</p> 		<p align="center"> Figure 7 Action Area Soil Map Units ONEOK Hydrocarbon, L.P. Mont Belvieu NGL Fractionation Facility Chambers County, Texas </p>
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APPENDIX B - PHOTOGRAPHS



Photograph 1: View north across the north portion of the proposed Frac-3 and Frac-4 Facility site.



Photograph 2: View southwest across the proposed Frac-3 and Frac-4 Facility site.

ONEOK
Mont Belvieu Natural Gas Liquids
Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 3: View east across the site of the proposed Frac-3 and Frac-4 Facility. The MB3 facility that is under construction can be seen in the distance.



Photograph 4: View southeast across the southern portion of the proposed Frac-3 and Frac-4 Facility site.

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Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 5: View northeast across the proposed site of the new substation for the proposed Frac-3 and Frac-4 Facility.



Photograph 6: View north at the site of the new water intake structure along the Coastal Water Authority Canal.

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Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 7: View south across the Coastal Water Authority Canal at the existing water intake structure located north of the proposed Facility.



Photograph 8: View east from the approximate location of Outfall 001.

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Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 9: View west towards the approximate location of Outfall 001.



Photograph 10: View south at the approximate location of Outfall 002.

ONEOK
Mont Belvieu Natural Gas Liquids
Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 11: View north at the approximate location of Outfall 003 north of Winfree Street.



Photograph 12: View South along Smith Gully. Photograph taken from Winfree Street, south of the proposed facility. Effluent from Outfall 002 and 003 enter Smith Gully at this point.

ONEOK
Mont Belvieu Natural Gas Liquids
Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 13: View north along a tributary to Smith Gully southeast of the Frac-3 and Frac-4 facility. This tributary will convey effluent from Outfall 001 to Smith Gully. Photograph taken from North Farm to Market 568 Road.



Photograph 14: View East along Smith Gully. Photograph taken from Highway 146, at the south end of Mont Belvieu.

ONEOK
Mont Belvieu Natural Gas Liquids
Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013



Photograph 15: View south along Smith Gully. Photograph taken from Sun Oil Road.



Photograph 16: View north of Cedar Bayou from the bridge along the Interstate 10 north frontage road.

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Mont Belvieu Natural Gas Liquids
Fractionation Facility
Mont Belvieu, Chambers County, Texas



Site Photographs
December 2013

APPENDIX C - FIELD NOTES

Field Notes

Date: December 9 through 11, 2013

Site Inspection Notes for the ONEOK Frac-3 and Frac-4 Expansion Site at the Mont Belvieu Natural Gas Liquids Fractionation Facility

Surveyor: Brian Roh

December 9, 2013

Weather: Max Temperature 48°F; Minimum Temperature 42°F; humid; cloudy with occasional episodes of mist and drizzling rain; wind approximately 7 mph from the north.

Survey began along Interstate 10 frontage roads. Retail and light industrial developments occur along the north and south frontage road. Open fields and vacant lots were primarily dominated by Bermuda grass (*Cynodon dactylon*).



Looking east along the Interstate 10 south frontage road.



Looking east along the Interstate 10 north frontage road.

December 9 through 11, 2013

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Survey continued along Farm to Market (FM) 3180. A high school, middle school, community college, a city park, retail businesses and several residential communities are present along FM 3180. Maintained lawns, open spaces, and parks were dominated by Bermuda grass. Other species included blue grass (*Poa* spp.), prairie broomweed (*Amphiachyris dracunculoides*), annual ragweed (*Ambrosia artemisiifolia*), yellow nutsedge (*Cyperus esculentus*), and narrowleaf plantain (*Plantago lanceolata*).



View north along FM 3180



View south along FM 3180

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Areas west of FM 3180 are in the early stages of residential development.



View southwest at the Cypress Point Road - Wilburn Ranch Drive intersection east of FM 3180.



View west at the intersection of Cypress Point Road and Wilburn Ranch Drive east of FM 3180.

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Eagle Point Golf Course is present north of a residential community along FM 565 in Old River-Winfree. Within the Action Area, Cherry Point Gully crosses the golf course. Additionally, the golf course and the residential community are along the southeast bank of Old River and Cherry Point Gully.



View north of Eagle Point Golf Course from River Run Road West. The golf course, and recreation complex, and adjacent residential areas consisted of bentgrass (*Agrostis* spp.), Bermuda grass, and loblolly pines that were part of maintained landscapes.

Common grasses, weeds, and ornamental trees and shrubs occur within maintained lawns of retail and residential developments along FM 565 near Old River - Winfree.



View west along FM 565

December 9 through 11, 2013

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Pastures are present between the residential developments east and west of FM 3180. Species present within the pastures included tall fescue (*Schedonorus arundinaceus*), witchgrass (*Panicum capillare*), dallisgrass (*Paspalum dilatatum*), Bermuda grass, broomweed, goldenrod (*Salidago* spp.), narrowleaf plantain, and annual ragweed.



View of pasture north of FM 565 and west of Canal Road.



View south from FM 565 and east of FM 3180 – FM 565 intersection.

December 9 through 11, 2013
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View north from Cherry Creek Drive.



View west from Eagle Ridge Drive.

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Many gas pipelines cross through the northeast portion of the Action Area and divide wooded areas. The wooded areas typically consist of a mix of pine and deciduous forest species including loblolly pine (*Pinus taeda*), sweetgum (*Liquidamber styraciflua*), sugarberry (*Celtis laevigata*), Chinese tallow (*Triadica sebifera*), Chinese privet (*Ligustrum sinense*), and greenbrier (*Smilax* spp.).



View east from Cherry Creek Drive. The pipeline corridor, which was dominated by Bermuda grass, crosses through loblolly pine woodlands.

December 9 through 11, 2013

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December 10, 2013

Weather: Max Temperature 50°F; Minimum Temperature 33°F; humid; sunny; wind approximately 13 mph from the north-northwest.

Survey began within the limits of Mont Belvieu in areas south of the Frac-3 and Frac-4 facility and east of State Route 146. This area consists of residential, retail businesses, and industrial facilities with relatively small pockets of mixed pine and deciduous woodland. Many pipeline and overhead electrical transmission line corridors cross through Mont Belvieu.



View west along a pipeline corridor dominated by Johnsongrass (*Sorghum halepense*) crossing through a mixed pine and deciduous woodland dominated by loblolly pine. Photograph taken along State Route 146.



View south along a pipeline corridor south of Sun Oil Road, south of the Frac-3 and Frac-4 Facility and east of State Route 146. The woodland area on either side of the pipeline included Chinese tallow (*Triadica sebifera*), sugarberry (*Celtis laevigata*), Chinese privet (*Ligustrum sinense*), and greenbrier (*Smilax* spp.).

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Apartment complex east of State Route 146.

The survey continued west of State Route 146. Most of the area to the area west of State Route 146 has been developed and consists of existing industrial facilities and infrastructure. Common and weedy plants, including Bermuda grass, Johnsongrass, great ragweed (*Ambrosia trifida*), and annual ragweed, are present along roads, berms, and within these highly developed areas.



View north along Pablo Road, west of State Route 146.

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View west along Fitzgerald Road, west of State Route 146.



View east along railroad spur. Photograph taken east of Hatcherville Road, west of State Route 146.

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View east along the Coastal Water Authority Canal where crossed by Hatcherville Road, west of State Route 146.



View south from FM Road 1942. Photograph taken at the west edge of the Action Area.

December 9 through 11, 2013

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View north from FM Road 1942. Photograph taken at the west edge of the Action Area. Common species present in the surrounding woodland included Chinese tallow, sugarberry, and Chinese privet.

The survey continued to areas immediately south and east of the proposed Frac-3 and Frac-4 site. These areas consist of vacant lots, and pastures with pump jacks, tanks, pipelines and valve stations, and abandoned wells.



View south across a vacant field dominated by tall fescue, annual ragweed, and witchgrass. Photograph taken east of the proposed Frac-3 and Frac-4 facility.

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Abandoned well surrounded by Chinese tallow saplings in the vacant lot east of the proposed Frac-3 and Frac-4 facility.



Existing pump jacks and equipment located in the southeast portion of the proposed Frac-3 and Frac-4 facility.

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The survey continued at the facility footprint for the propose Frac-3 and Frac-4, which is located within the construction contractor parking for construction of the MB3 facility.



View west within the propose Frac-3 and Frac-4 facility footprint. The MB3 facility, which is currently under construction, can be seen in the distance.



View north within the propose Frac-3 and Frac-4 facility footprint.

December 9 through 11, 2013

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View north from Winfree Street toward the proposed Frac-3 and Frac-4 facility. The relatively small dissected woodlands at this location included Chinese tallow, American elm (*Ulmus americana*), sugarberry, possumhaw (*Ilex decidua*), and Chinese privet.



View north at the approximate location of Outfall 003 north of Winfree Street. Species present in this area include tall fescue, witchgrass, annual ragweed, and white heath aster (*Symphotrichum ericoides*).

December 9 through 11, 2013
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The survey ended where State Route 146 crossed the Cedar Point Canal.



View southeast along Cedar Point Canal.

December 9 through 11, 2013

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December 11, 2013

Weather: Max Temperature 51°F; Minimum Temperature 41°F; humid; cloudy; wind approximately 3 mph from the north.

The survey included areas within the proposed Frac-3 and Frac-4 facility on ONEOK's property. This area consists mostly of disturbed areas that are adjacent to the ongoing construction activities for the permitted MB3 facility.



View northeast toward site of new substation for the proposed Frac-3 and Frac-4 facility. The wooded area adjacent to the existing substation included Chinese tallow, American elm, sugarberry, possumhaw, and Chinese privet.



View north toward the site of the proposed new water intake structure along Cedar Point Canal. This area was dominated by white heath aster (*Symphotrichum ericoides*), tall fescue, and annual ragweed.

December 9 through 11, 2013

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View east from the approximate location of Outfall 001. Species present in this area include tall fescue, sedges (*Cyperus* spp.), annual ragweed, herb of grace (*Bacopa monnieri*), Chinese tallow, and rattlebox (*Sebania punicea*).



View south at the approximate location of Outfall 002. Species present in this area include bluegrass, Bermuda grass, Johnsongrass, and annual ragweed. Species present in the woodland included Chinese tallow, American elm, sugarberry, possumhaw, and Chinese privet.

The survey concluded by visiting Cedar Bayou and Smith Gully. Cedar Bayou is a perennial stream located in the southeast portion of the Action Area. Smith Gully is an intermittent stream tributary to Cedar Bayou that begins south of Winfree Street and empties into Cedar Bayou north of Interstate 10 and west of State Route 146. Both streams have a woody riparian corridor along their banks that includes black willow (*Salix nigra*), Chinese tallow, laurel oak (*Quercus laurifolia*), sugarberry, southern red oak (*Quercus falcata*), possumhaw, and Chinese privet.

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View North along Cedar Bayou. Photograph taken from the Interstate 10 north frontage road.



View south along Smith Gully. Photograph taken from Sun Oil Road, east of State Route 146.

APPENDIX D - AIR MODELING REPORT

Atmospheric Dispersion Modeling Analysis in Support of Prevention of Significant Deterioration (PSD) Permit Application for Greenhouse Gases (GHGs)

ONEOK Hydrocarbon, L.P.
Expansion Project for the
Mont Belvieu NGL Fractionation Plant

Mont Belvieu, Chambers County
Customer Number CN603674086
Regulated Entity Number RN106123714

February 2014

Prepared by:

Miranda L. Cheatham, P.E.
Senior Consulting Engineer

This document is being released for the purpose of draft review under the authority of Miranda L. Cheatham, P.E., 101019, on February 3, 2014, firm registration for Waid Corporation dba Waid Environmental Certificate of Registration No. F-58. It is not to be used for final submittal.

Waid Corporation dba Waid Environmental
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of TCEQ Air Quality Modeling Guidelines, February 1999)

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APPENDIX A – MODELING INPUT TABLES

APPENDIX B – PLOT PLAN

APPENDIX C – STATE ANALYSIS AREA MAP

SECTION 1.0

PROJECT IDENTIFICATION INFORMATION

Applicant: ONEOK Hydrocarbon, L.P.

Contact: Terrie Blackburn
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Terrie.Blackburn@oneok.com

Facility: Mont Belvieu NGL Fractionation Plant

Permit Application No.: Proposed Permit No. TBD

Nearest City and County: Mont Belvieu, Chambers County

Modeler: Waid Environmental Contact:

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Senior Consulting Engineer
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mcheatham@waid.com

SECTION 2.0

PROJECT OVERVIEW

ONEOK Hydrocarbon, L.P. (OHLP) is proposing to construct an expansion of its Natural Gas Liquids Fractionation Facility in Mont Belvieu, Chambers County, Texas. The facility to be constructed (the “facility” or “Frac-3 and Frac-4 Facility” or “Project”) will consist of two additional fractionation trains. This air dispersion modeling analysis has been performed in support of the Project’s biological assessment. This report documents the modeling methodology that was used in the enclosed air dispersion modeling analysis. Detailed process descriptions and process flow diagrams, as well as documentation of emission calculations, can be found in the appropriate sections of the air permit application. Copies of the modeling input tables are provided in Appendix A of this report.

2.1 Type of Permit Review

The proposed Frac-3 and Frac-4 Facility Project triggers Prevention of Significant Deterioration (PSD) review for greenhouse gases (GHGs). The Project is also expected to trigger PSD review for NO_x, CO, PM, PM₁₀, PM_{2.5}, and SO₂.

2.2 Constituents to be Evaluated

An air quality analysis was conducted for Project emissions of criteria air pollutants with a primary or secondary National Ambient Air Quality Standard (NAAQS) or Increment standard. The applicable pollutants and averaging times are¹:

- CO, 1-hr
- CO, 8-hr
- NO₂, 1-hr
- NO₂, annual
- Ozone, 8-hr (modeling not conducted because Project increases of NO_x and VOC will be offset as part of regulatory requirement to ensure no adverse impacts in nonattainment area)
- PM₁₀, 24-hr
- PM₁₀, Annual
- PM_{2.5}, 24-hr
- PM_{2.5}, Annual
- SO₂, 1-hr
- SO₂, 3-hr
- SO₂, 24-hr (NAAQS has been revoked, but included here per TCEQ request)
- SO₂, Annual (NAAQS has been revoked, but included here per TCEQ request)

An air quality analysis was also conducted for Project emissions of non-criteria pollutants. Section 13.0 of this report lists the non-criteria pollutants included in the evaluation.

¹ <http://www.epa.gov/air/criteria.html>

SECTION 3.0

PLOT PLAN

The Mont Belvieu NGL Fractionation Plant is shown on the enclosed plot plan in Appendix B. The plot plan includes a clearly marked scale, all property lines, all emission points, a true north arrow, UTM coordinates (NAD83), and all buildings and structures which could create downwash effects. The length, width, and heights of the buildings and structures are summarized in a table on the plot plan.

SECTION 4.0

AREA MAP

The area map is provided in Appendix C. It is an excerpt of a United States Geological Survey (USGS) 7.5-minute quadrangle. This area map displays a UTM coordinate grid, property lines, and a 3 km radius circle from the plant.

SECTION 5.0

AIR QUALITY MONITORING DATA

A significant impact level (SIL) is a screening value used to evaluate the impact of a proposed project on ambient air quality. If modeled project emissions are below the SIL, no adverse ambient air quality effect is expected. SILs for criteria pollutants other than PM_{2.5} have been documented in regulations or EPA modeling guidance. However, current EPA modeling guidance states that use of the 24-hr and annual PM_{2.5} SILs must be justified. Therefore, a representative ambient monitoring background concentration was determined for these averaging times. The figure included at the end of this section maps the location of the monitoring stations in relation to the proposed Frac-3 and Frac-4 Facility. The table included at the end of this section summarizes the monitoring results.

PM_{2.5}

According to EPA's memo "Circuit Court Decision on PM_{2.5} Significant Impact Levels and Significant Monitoring Concentration", dated March 4, 2013, SILs may still be used. The memo states that *'If the preconstruction monitoring data shows that the difference between the PM_{2.5} NAAQS and the monitored PM_{2.5} background concentrations in the area is greater than the EPA's PM_{2.5} SIL value, then the EPA believes it would be sufficient in most cases for permitting authorities to conclude that a proposed source with a PM_{2.5} impact below the PM_{2.5} SIL value will not cause or contribute to a violation of the PM_{2.5} NAAQS and to forgo a more comprehensive cumulative modeling analysis for PM_{2.5}.'* As shown in the table below, the difference between the PM_{2.5} NAAQS and the monitored PM_{2.5} backgrounds are 8.5 µg/m³ for the 24-hr averaging time and 0.9 µg/m³ for the annual averaging time. These values are greater than the SILs used in the analysis.

PM_{2.5} Monitor Values vs. NAAQS

Pollutant	Averaging Time	SIL used in Modeling Analysis (µg/m ³)	NAAQS Standard (µg/m ³)	Ambient Monitored Concentration (µg/m ³)	Difference between NAAQS and Ambient Monitoring Concentration (µg/m ³)	Is Difference of Monitored Concentration and NAAQS greater than SIL used?
PM _{2.5}	24-hr	1.2	35	26.5	8.5	Yes
PM _{2.5}	Annual	0.3	12	11.1	0.9	Yes

An inventory of available PM_{2.5} monitoring stations was obtained from EPA's AirData website². The PM_{2.5} monitor closest to the proposed Frac-3 and Frac-4 Facility is at 7210 Bayway Drive, and it was chosen as the representative monitor. The monitor is located approximately 17 km

² http://www.epa.gov/airquality/airdata/ad_rep_mon.html

southwest of the proposed Frac-3 and Frac-4 Facility. Measured values from this monitor should be conservatively high compared to the expected ambient concentration at the Project location. They are expected to be conservatively high because the monitor is located in an area with greater emissions (it is east of the Houston Ship Channel) and a greater population (it is in Baytown) than the Project site. The topography at the monitoring site is similar to the topography at the Project site (flat). The prevailing wind direction is from the south at both the monitoring site and the Project site. The table below summarizes the most recent available PM_{2.5} emissions data (from TCEQ) for sources within 5 km of the monitor as compared to sources within 5 km of the Project.

Location	PM _{2.5} Emissions Reported in 2011 (tons/yr)
Within 5 km of monitoring site	1508
Within 5 km of Project site	192

Location	2010 Population ³
Baytown, TX (monitoring site)	71,802
Mont Belvieu, TX (Project site)	3,835

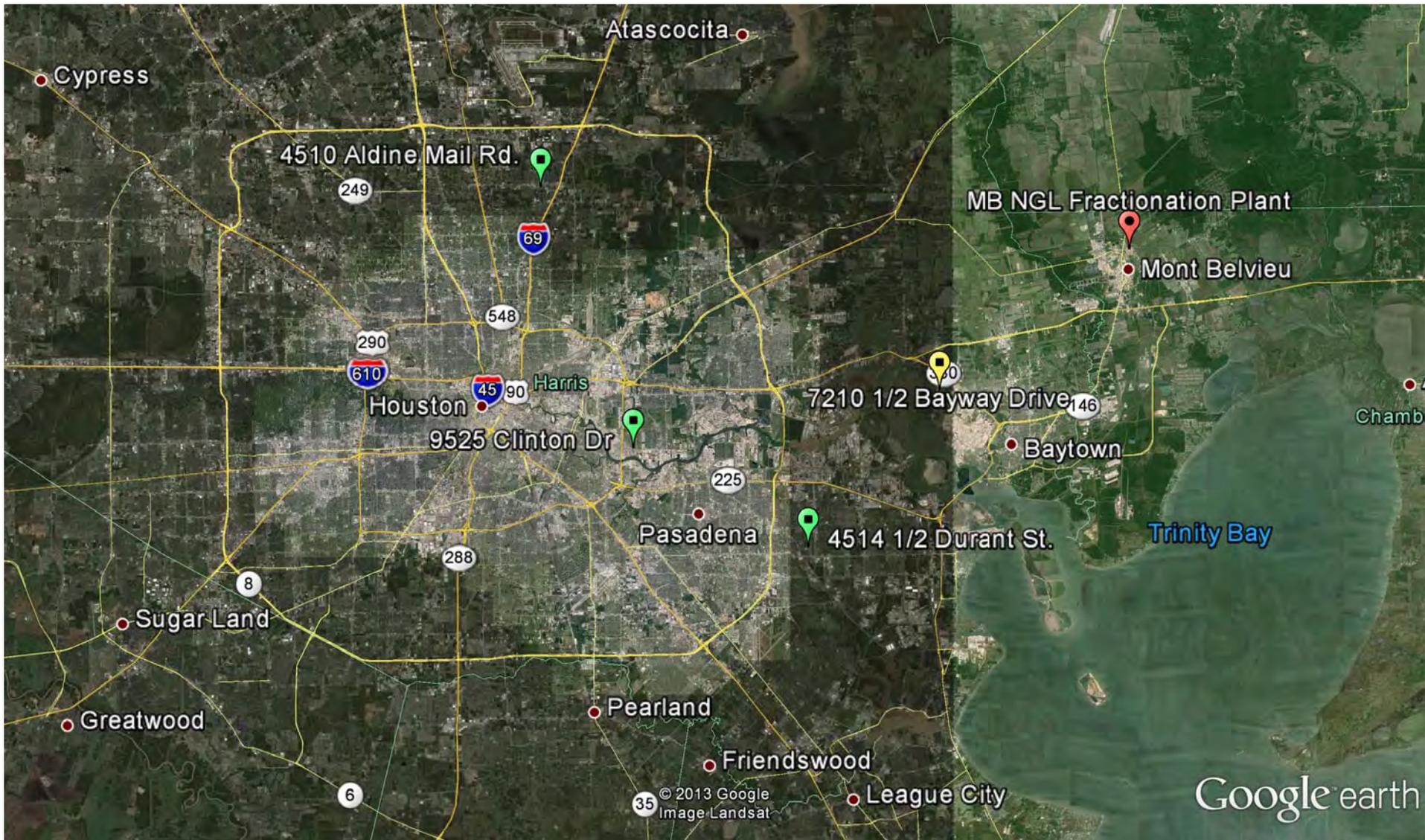
The most recent 3 years of monitoring data (2010-2012) were used. The maximum 24-hr average concentration values for each year were averaged to determine the representative 24-hr background concentration of 26.5 µg/m³. The annual average concentration values for each year were averaged to determine the representative annual background concentration of 11.1 µg/m³.

The map included on page 5-4 of this report illustrates the locations of the available PM_{2.5} monitoring sites and the Project site (labeled as MB NGL Fractionation Plant).

³ http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml

Summary of Monitoring Data

Pollutant	Monitor ID	Latitude	Longitude	City	County	Distance from Site (km)	Year of Monitored Data	Max 24-hr ($\mu\text{g}/\text{m}^3$)	Annual Average ($\mu\text{g}/\text{m}^3$)
PM _{2.5}	7210 1/2 Bayway Drive	29.7706	-95.0311	Baytown	Harris	17	2012	28.6	10.6
							2011	23.2	11.9
							2010	27.6	10.9
							3-yr Average	26.5	11.1



Google Earth Pro



SECTION 6.0

MODELING EMISSIONS INVENTORY

6.1 On-Property Sources to be Reviewed

All new and increased emissions from the proposed Project were modeled.

6.2 Other On-Property and Off-Property Sources

All sources with new and increased emissions of the affected pollutants from the proposed Project were modeled. No other on-property sources are within the scope of the proposed Frac-3 and Frac-4 Facility Project, and therefore were not included in this analysis. Since the scope of this modeling exercise was to determine the magnitude and area of potential impact for the proposed Project, no off-property sources were considered in this analysis.

6.3 EPN and Model Input File Source ID Number Cross-Reference

An EPN and model input file source ID number cross-reference is shown on the modeling input tables in Appendix A.

6.4 Stack Parameter Justification

Copies of the modeling input tables, which are provided in Appendix A, summarize source emission rates and release parameters in metric units used in the modeling.

Source Types

Truck loading emissions resulting from spent caustic and wastewater loadout were modeled as pseudo-point sources with a height approximately equal to the tank/truck height. Equipment leak fugitives were modeled as area sources. Residual maintenance, startup, and shutdown (MSS) emissions to atmosphere were modeled as a volume source. All other emission sources were modeled as point sources.

Source Locations

The locations of all modeled point, volume, and area sources are shown on the plot plan in Appendix B. Routine process emissions are released at fixed locations. Piping fugitive emissions of VOC (model IDs FUG04 and FUG05) were modeled as an area source with dimensions that encompass each unit's boundary.

Residual VOC MSS emissions to atmosphere (model ID MSSFUG3) were modeled by conservatively assuming that all of the emissions would be concentrated and released from the vessel closest to the eastern property boundary. Residual NH₃ MSS emissions to atmosphere (model ID MSSNH3FU) were modeled by conservatively assuming all the emissions would be concentrated and released from a single ammonia storage tank. These are worst-case scenarios because concentrating fugitive emissions results in higher modeled off-property concentrations.

Emission Rates

New and increased emissions from the proposed Project were modeled. An NO_2/NO_x ratio of 0.8 was assumed for 1-hr NO_2 modeling, and an NO_2/NO_x ratio of 1.0 was assumed for annual NO_2 modeling.

Various process vents are sent to the heater fireboxes for emissions control. Additionally, the heaters will have higher short-term allowable NO_x and CO emission rates during maintenance, startup, shutdown (MSS) operation. The permit will limit these higher MSS emissions to no more than 4 out of the 6 new heaters during any single hour.

To determine the relative off-property impacts from each heater at a given emission rate, a scaling run was performed. All of the process vent emissions are conservatively assumed to be emitted from a single heater. The worst-case heater was used for each averaging period. The four worst-case heaters were assumed to be emitting at the higher MSS allowable rates for the short-term NO_x and CO demonstrations, while the other two heaters were assumed to be emitting at their normal permit allowable rates.

The emergency engines were included in the 1-hr NO_2 modeling demonstration at their annual average emission rates because the emergency engines are not likely to operate when the normal NO_2 emission sources from the process are operating at their peak NO_2 emission rates. 30 TAC Chapter 117 limits the emergency engines to operating no more than 52 hours per year for testing or maintenance purposes. Emergency operation is allowed but emergencies are not foreseeable and are not part of the permit's allowable emission rate.

Similarly, MSS flaring emissions were included in the 1-hr NO_2 modeling demonstration at their annual average emission rates because MSS flaring is not likely to occur when the normal NO_2 emission sources from the process are operating at their peak NO_2 emission rates. Permitted MSS flaring emissions were calculated assuming 48 hours per year of MSS flaring.

Use of the annual average emission rate when modeling the intermittent emergency engine and MSS flaring emission sources is supported by the EPA's March 1, 2011 memorandum "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard."

MSS emissions from the flare and residual MSS emissions to atmosphere were conservatively assumed to occur simultaneously with normal operating emissions.

Release Height

Estimated actual release heights were modeled for the point sources. The area sources were modeled with a release height of 3 ft. The volume source was modeled using a vertical dimension equal to half the vessel height, and emissions were assumed to be released from the midpoint of the volume source.

Temperature

Estimated actual exhaust temperatures were modeled. An effective temperature of 1270K was used for the flare according to TCEQ modeling guidance. The cooling towers and spent material loading operations were modeled with a temperature of 0K, which AERMOD equates to ambient temperature.

Exit Diameter

A minimal exit diameter of 0.001 m was modeled for the pseudo-point sources. Estimated actual stack diameters were modeled for all other point sources. The effective stack exit diameter of the flare was determined based on TCEQ guidance, as documented in the modeling input table.

Exit Velocity

A minimal exit velocity of 0.001 m/s was modeled for the pseudo-point sources. Estimated actual stack exit velocities were modeled for all other point sources. The flare was modeled with an exit velocity of 20 m/s according to TCEQ guidance.

6.5 Scaling Factors

Because of the large number of non-criteria pollutants evaluated, a scaling procedure was used to limit the number of modeling runs required. Details on the procedure are included in Section 13.0 of this report.

SECTION 7.0

MODELS AND MODELING TECHNIQUES

Modeling was performed using EPA's AERMOD version 12345. The regulatory default options were used.

SECTION 8.0

SELECTION OF DISPERSION OPTION

The selection of either urban or rural dispersion coefficients for this modeling analysis is based on the land use method. The land use procedure involves classifying the land use within a 3000-m radius about the source by using the meteorological land use typing scheme proposed by August H. Auer, Jr., "Correlation of Land Use and Cover with Meteorological Anomalies," Journal of Applied Meteorology, May 1978, Vol. 17, pp. 636-643. If the land use Types I1, I2, C1, R2, and R3 account for 50% or more of the total area, urban dispersion coefficients should be used; otherwise, rural dispersion should be used.

The estimated land use is based on USGS 7.5-Minute Series Hackberry Lake, TX Quadrangle (illustrated using the area map in Appendix C) and publicly-available aerial photographs. Since, by inspection, the percent urban area is less than 50%, the rural dispersion coefficient was used in this modeling analysis.

SECTION 9.0

BUILDING WAKE EFFECTS (DOWNWASH)

The building downwash parameters input into the AERMOD model were prepared using the BPIP building downwash model (dated 04274). The "P" flag was set for preparing downwash related data for a model run utilizing the PRIME algorithm, as required by the AERMOD program. The locations of all buildings and structures are provided on the plot plan.

SECTION 10.0

RECEPTOR GRID - TERRAIN

Receptor elevations were considered and assigned using AERMAP (version 11103). Receptor elevations were extracted from a National Elevation Dataset (NED) file at 1 Arc Second resolution obtained from the USGS' Multi-Resolution Land Characteristics Consortium⁴. The elevation file was in GeoTIFF format and used NAD 83 datum.

⁴ <http://www.mrlc.gov/viewerjs/>

SECTION 11.0

RECEPTOR GRID - DESIGN

Receptor grids used in this analysis are based on UTM coordinates (NAD 1983). Receptors were placed on the property line every 25 meters. A 25 meter receptor spacing was then used out to 100 meters from the property line, a 100 meter receptor spacing was used out to 1,000 meters from the property line, and a 500 meter receptor spacing was used out to 5,000 meters from the property line. Receptors were also placed every 15 meters within the small inset parcel of property not owned by ONEOK Hydrocarbon, L.P.

SECTION 12.0

METEOROLOGICAL DATA

Meteorological data for Chambers County was obtained from the TCEQ's website⁵ and used in the modeling analysis. Meteorological data for Chambers County uses surface data from Port Arthur (BPT) and upper air data from Lake Charles (LCH). The surface station base elevation is 4.9 meters.

To develop their meteorological data files, TCEQ processed the surface and upper air data using AERMET (version 12345). TCEQ provides three different meteorological data sets – low, medium, and high surface roughness. The AERSURFACE program (dated 13016) was run to determine which data set to use.

Land cover data was obtained from the USGS NLCD92 archives⁶. AERSURFACE was run using this land cover data and a default 1 km radius from the center of the Project. The resulting surface roughness length of 0.080 meter corresponds to TCEQ's low surface roughness category (0.001-0.1 meter). Therefore, the low surface roughness meteorological data set was used.

Criteria pollutant modeling was performed using five years of meteorological data. Non-criteria pollutant modeling was performed using a single year of meteorological data.

⁵ http://www.tceq.texas.gov/permitting/air/modeling/aermod_datasets.html

⁶ <http://www.mrlc.gov/viewerjs/>

SECTION 13.0

MODELING RESULTS

An air quality analysis was conducted for Project emissions of criteria air pollutants with a primary or secondary National Ambient Air Quality Standard (NAAQS). An air quality analysis was also conducted for Project emissions of non-criteria pollutants. The tables included at the end of this section summarize the modeling results.

Criteria Pollutants

All new and increased emissions from the proposed Frac-3 and Frac-4 Project were modeled, and the resulting concentrations were compared to the appropriate Significant Impact Level (SIL). If the concentration is less than the SIL, no further analysis is required. If the concentration is greater than the SIL, then a Radius of Significant Impact is defined. The Project emission point centroid (317636 m E, 3304754 m N) was used as the center point to define the Radius of Significant Impact. The 1-hr NO₂ analysis yields the largest Radius of Significant Impact (4.46 km).

All sources with new and increased emissions of the affected pollutants from the proposed Project were modeled. No other on-property sources are within the scope of the proposed Frac-3 and Frac-4 Project, and therefore were not included in this analysis. Since the scope of this modeling exercise was to determine the magnitude and area of potential impact for the proposed Project, no off-property sources were considered in this analysis.

The air permit application submitted to and reviewed by TCEQ will include a PSD modeling demonstration. That demonstration will address cumulative impacts from the Project, other on-site sources, off-property sources, and background concentrations, as applicable. It will demonstrate that the proposed emissions are protective of the NAAQS and Increment.

Summary of Criteria Pollutant Modeling Results

Pollutant	Averaging Time	SIL^{a,b,c} (µg/m³)	Max Modeled Concentration (µg/m³)	Max Modeled Concentration Above SIL?	Radius of Significant Impact (km)	PSD Primary NAAQS Standard^d (µg/m³)	PSD Secondary NAAQS Standard^d (µg/m³)	PSD Increment Standard^e (µg/m³)
CO	1-hr	2,000	1313	No	N/A	40,000	N/A	N/A
CO	8-hr	500	832	Yes	0.51	10,000	N/A	N/A
NO ₂	1-hr	7.5	12.3	Yes	4.47	188	N/A	N/A
NO ₂	Annual	1	1.43	Yes	0.28	100	100	25
PM ₁₀	24-hr	5	13.2	Yes	0.60	150	150	30
PM ₁₀	Annual	1	2.51	Yes	0.53	50	50	17
PM _{2.5}	24-hr	1.2	3.3	Yes	0.90	35	35	9
PM _{2.5}	Annual	0.3	0.66	Yes	0.57	12	15	4
SO ₂	1-hr	7.8	11.7	Yes	1.08	196	N/A	N/A
SO ₂	3-hr	25	10.7	No	N/A	N/A	1300	512
SO ₂	24-hr	5	6.3	Yes	0.76	365	N/A	91
SO ₂	Annual	1	0.48	No	N/A	80	N/A	20

^a Unless otherwise specified, from 40 CFR §51.165(b)(2)

^b For 1-hr NO₂, from TCEQ's July 22, 2010 "Interim 1-Hour Nitrogen Dioxide (NO₂) NAAQS Implementation Guidance"

^c For 1-hr SO₂, from TCEQ's August 1, 2010 "Interim 1-Hour Sulfur Dioxide (SO₂) NAAQS Implementation Guidance"

^d From www.epa.gov/air/criteria.html, converted to the appropriate units of measurement as necessary

^e From 40 CFR §51.166(c)(1)

Summary of Heater Scaling Modeling Results

EPN	MODEL ID	DESCRIPTION	Maximum Modeled Concentration at 1 lb/hr Emission Rate									
			1-hr		3-hr		8-hr		24-hr		Annual	
			($\mu\text{g}/\text{m}^3$)	Rank	($\mu\text{g}/\text{m}^3$)	Rank	($\mu\text{g}/\text{m}^3$)	Rank	($\mu\text{g}/\text{m}^3$)	Rank	($\mu\text{g}/\text{m}^3$)	Rank
H-07	H07	Hot Oil Heater 7	0.438	5	0.399	4	0.353	4	0.204	4	0.0205	4
H-08	H08	Hot Oil Heater 8	0.556	1	0.509	1	0.422	3	0.275	3	0.0207	3
H-09	H09	Hot Oil Heater 9	0.536	3	0.484	3	0.433	2	0.300	1	0.0226	2
H-10	H10	Hot Oil Heater 10	0.439	4	0.397	5	0.345	6	0.201	5	0.0199	6
H-11	H11	Hot Oil Heater 11	0.434	6	0.394	6	0.346	5	0.199	6	0.0202	5
H-12	H12	Hot Oil Heater 12	0.544	2	0.486	2	0.477	1	0.289	2	0.0238	1

US EPA ARCHIVE DOCUMENT

Non-Criteria Pollutants

An air quality analysis was also conducted for Project emissions of non-criteria pollutants (that is, pollutants for which there is no federal ambient air quality standard). The modeled non-criteria pollutants include those represented in the permit application (e.g. butanes) and products of natural gas and diesel combustion that are hazardous air pollutants (HAPs) with emission factors listed in AP-42 Sections 1.4, 3.2, and 3.3. Diethanolamine (DEA) and hot oil (Therminol 55) were included in the equipment leak fugitive emission calculations in the permit application; however, these chemicals were not modeled because they are not volatile enough to be considered air contaminants, per TCEQ guidance.⁷ DEA and hot oil each have a vapor pressure less than 0.01 mmHg at 40°C. Carbon dioxide, ethane, hydrogen, methane, nitrogen, and propane were not included in the air quality analysis because they are simple asphyxiants, per TCEQ guidance.⁸

New and increased emissions from the proposed Frac-3 and Frac-4 Facility Project were modeled, and the resulting concentrations were compared to the appropriate Effects Screening Level (ESL) given by the TCEQ.⁹ Per TCEQ's "Modeling and Effects Review Applicability" guidance document, dated July 2009, an ESL is defined as follows:

ESL—Effects screening level as derived by the Toxicology Division. Guideline concentrations used to evaluate ambient air concentrations of constituents. Based on a constituent's potential to cause adverse health effects, odor nuisances, vegetation effects, or materials damage. Health-based screening levels are set at levels lower than levels reported to produce adverse health effects, and are set to protect the general public, including sensitive subgroups such as children, the elderly, or people with existing respiratory conditions. If an air concentration of a constituent is below the screening level, adverse effects are not expected. If an air concentration of a constituent is above the screening level, it is not indicative that an adverse effect will occur, but rather that further evaluation is warranted.

Because of the large number of non-criteria pollutants evaluated, a scaling procedure was used to limit the number of modeling runs required. A single run (labeled VOC) was performed to address pollutants emitted solely from the natural gas and/or diesel combustion sources. Each of the emergency engines (Model IDs ENG07, ENG08, and ENG09) was modeled as its own source group. Two of the emergency engines (ENG07 and ENG08) are diesel-fired and one (ENG09) is natural-gas fired. The routine natural gas combustion sources (Model IDs FL02, H07, H08, H09, H10, and H11) were collected into source group NATGAS. VOC emissions from each source were modeled.

The maximum off-property concentration determined using the VOC modeling run was then scaled to determine the maximum off-property concentration of other non-criteria pollutants.

⁷ <http://www.tceq.texas.gov/assets/public/permitting/air/memos/vapor4.pdf>

⁸ <http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/mera.pdf>

⁹ http://www.tceq.texas.gov/toxicology/esl/list_main.html#esl_1; the list used in this analysis is dated 2/1/13.

Off – property impact of pollutant i =

$$(Off – property impact of VOC from ENG07) \left(\frac{emission\ rate\ of\ pollutant\ i\ from\ ENG07}{emission\ rate\ of\ VOC\ from\ ENG07} \right)$$

+

$$(Off – property impact of VOC from ENG08) \left(\frac{emission\ rate\ of\ pollutant\ i\ from\ ENG08}{emission\ rate\ of\ VOC\ from\ ENG08} \right)$$

+

$$(Off – property impact of VOC from ENG09) \left(\frac{emission\ rate\ of\ pollutant\ i\ from\ ENG09}{emission\ rate\ of\ VOC\ from\ ENG09} \right)$$

+

$$(Off – property impact of VOC from nat. gas combustion) \left(\frac{emission\ rate\ of\ pollutant\ i\ from\ nat.\ gas\ combustion}{emission\ rate\ of\ VOC\ from\ nat.\ gas\ combustion} \right)$$

The following pollutants are emitted from sources other than natural gas or diesel combustion units and were modeled using chemical-specific modeling runs:

- Ammonia,
- Butanes,
- Hydrogen sulfide (H₂S),
- Hexanes and heavier (Hexanes+), and
- Pentanes

Per TCEQ's modeling and effects review procedure, no further analysis is required if the maximum off-property concentration from routine Project emissions is less than 10% of the pollutant's ESL and if the maximum off-property concentration from Project MSS emissions is not above the pollutant's ESL for more than 24 hours per year.

Only the following pollutants are predicted to exceed 10% ESL from routine Project emissions:

- Acetaldehyde (25% of ESL)
- Acrolein (85% of ESL)
- Formaldehyde (150% of ESL)
- Polycyclic Aromatic Hydrocarbons (PAH, 28% of ESL)

The natural-gas fired emergency engine (ENG09) is the culpable source for each of these pollutants. Per TCEQ's modeling and effects review procedure, emissions from units fired only by pipeline-quality natural gas do not require effects review. Based on TCEQ's experience from many prior reviews, no adverse health or welfare impacts from these source types are expected. Each emergency engine will be authorized to operate only 100 hr/yr for planned testing. The modeling run assumes each engine will run at its maximum allowable rate for every hour of the year. In actual operation, it is extremely unlikely each engine will be emitting at its maximum allowable rate at the same time as worst-case meteorological conditions occur. Additionally, there is no nearby natural gas-fired source whose impacts are likely to add

significantly to the predicted concentration. Therefore, no adverse health effects, odor nuisances, vegetation effects, or materials damage are expected as a result of routine Project air emissions of non-criteria pollutants.

Only the following pollutants are predicted to exceed 100% ESL from Project MSS emissions:

- Ammonia (110% ESL)
- Hexanes+ (160% ESL)
- Pentanes (390% ESL)

As stated earlier, per TCEQ guidance no further review is required if the maximum off-property concentration from Project MSS emissions is not above the pollutant's ESL for more than 24 hours per year.

Project MSS emissions of ammonia will not exceed the ESL for more than 16 hours per year (as limited by the emission rate calculations). Therefore, no further review for ammonia is required.

Project MSS emissions of Hexanes+ will not exceed the ESL for more than 93 hours per year (as limited by the modeling results). Project MSS emissions of Pentanes will not exceed the ESL for more than 275 hours per year (as limited by the modeling results). Residual MSS emissions to atmosphere (MSS-FUG-3) are the culpable source for each of these pollutants. The model's predicted concentration and frequency of exceedance are extremely conservative because:

- All residual MSS degassing emissions are modeled as if they occur in the same small location, which is as close to the property line as possible. In actual operation, residual degassing emissions will be distributed throughout the new process units.
- Residual MSS degassing emissions are expected to occur no more than 534 hours per year. In actual operation, it is extremely unlikely the residual MSS degassing emissions will occur at their maximum allowable rate at the same time as worst-case meteorological conditions occur.

As illustrated in the plots in Section 14.0, predicted ESL exceedances for Pentanes and Hexanes+ are concentrated within a small area along the eastern property boundary near the modeled MSS source (MSS-FUG-3). This area consists of vacant land and unmanned oil and gas production sites.

No adverse health effects, odor nuisances, vegetation effects, or materials damage are expected as a result of Project air emissions of non-criteria pollutants.

Summary of Non-Criteria Pollutant Modeling Results

	Maximum 1-hr Total VOC Concentration ($\mu\text{g}/\text{m}^3$)
ENG07	1209.68174
ENG08	109.2132
ENG09	329.97643
Group NATGAS	0.77577

Chemical	Group for Modeling	ENG07			ENG08			ENG09			Group NATGAS			Chemical-Specific Modeling Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	Overall Model Results			
		Speciated Emissions (lb/hr)	Emissions as Wt. Frac. Of VOC (-)	Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	Speciated Emissions (lb/hr)	Emissions as Wt. Frac. Of VOC (-)	Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	Speciated Emissions (lb/hr)	Emissions as Wt. Frac. Of VOC (-)	Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	Speciated Emissions (lb/hr)	Emissions as Wt. Frac. Of VOC (-)	Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)		Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	Cumulative Maximum Off-Property Concentration ($\mu\text{g}/\text{m}^3$)	ESL ($\mu\text{g}/\text{m}^3$)	Concentration as % of ESL
		(lb/hr)	(-)	($\mu\text{g}/\text{m}^3$)		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	(%)									
Total VOC	1-Scaling	3.70E+00	1.00E+00		3.60E+00	1.00E+00		8.60E-01	1.00E+00		1.86E+00	1.00E+00						
1,1,2,2-Tetrachloroethane	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.55E-05	7.62E-05	2.51E-02	0.00E+00	0.00E+00	0.00E+00	2.51E-02	70	3.6E-02		
1,1,2-Trichloroethane	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.96E-05	4.60E-05	1.52E-02	0.00E+00	0.00E+00	0.00E+00	1.52E-02	550	2.8E-03		
1,1-Dichloroethane	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-05	3.41E-05	1.12E-02	0.00E+00	0.00E+00	0.00E+00	1.12E-02	4000	2.8E-04		
1,2-Dichloroethane	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-05	3.41E-05	1.12E-02	0.00E+00	0.00E+00	0.00E+00	1.12E-02	160	7.0E-03		
1,2-Dichloropropane	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.37E-05	3.92E-05	1.29E-02	0.00E+00	0.00E+00	0.00E+00	1.29E-02	460	2.8E-03		
1,3-Butadiene	1-Scaling	1.35E-04	3.65E-05	4.41E-02	1.37E-04	3.81E-05	4.16E-03	1.72E-03	2.00E-03	6.60E-01	0.00E+00	0.00E+00	0.00E+00	7.08E-01	510	1.4E-01		
1,3-Dichloropropene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-05	3.83E-05	1.26E-02	0.00E+00	0.00E+00	0.00E+00	1.26E-02	45	2.8E-02		
2-Methylnaphthalene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-05	1.20E-05	9.30E-06	9.30E-06	30	3.1E-05		
3-Methylchloranthrene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	7.04E-07	0.02	3.5E-03		
7,12-Dimethylbenz(a)anthracene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.50E-05	8.10E-06	6.29E-06	6.29E-06	0.5	1.3E-03		
Acenaphthene	1-Scaling	4.90E-06	1.32E-06	1.60E-03	4.98E-06	1.38E-06	1.51E-04	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	1.75E-03	1	1.8E-01		
Acenaphthylene	1-Scaling	1.75E-05	4.73E-06	5.72E-03	1.78E-05	4.94E-06	5.40E-04	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	6.26E-03	1	6.3E-01		
Acetaldehyde	1-Scaling	2.65E-03	7.16E-04	8.66E-01	2.69E-03	7.47E-04	8.16E-02	7.23E-03	8.41E-03	2.77E+00	0.00E+00	0.00E+00	0.00E+00	3.72E+00	15	2.5E+01		
Acrolein	1-Scaling	3.19E-04	8.62E-05	1.04E-01	3.25E-04	9.03E-05	9.86E-03	6.81E-03	7.92E-03	2.61E+00	0.00E+00	0.00E+00	0.00E+00	2.73E+00	3.2	8.5E+01		
Ammonia	2-Ammonia, chemical-specific													1.77 (Routine) 1923 (MSS, 16 hr/yr only)	1.77 (Routine) 1923 (MSS, 16 hr/yr only)	1.0E+00 (Routine), 1.1E+03 (MSS, 16 hr/yr only)		
Anthracene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-06	1.20E-06	9.30E-07	9.30E-07	0.5	1.9E-04		
Arsenic	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-04	1.00E-04	7.80E-05	7.80E-05	3	2.6E-03		
Benz(a)anthracene	1-Scaling	5.80E-06	1.57E-06	1.90E-03	5.90E-06	1.64E-06	1.79E-04	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	2.08E-03	0.5	4.2E-01		
Benzene	1-Scaling	3.22E-03	8.70E-04	1.05E+00	3.27E-03	9.08E-04	9.92E-02	4.09E-03	4.76E-03	1.57E+00	1.93E-03	1.04E-03	8.05E-04	2.72E+00	170	1.6E+00		
Benzo(a)pyrene	1-Scaling	6.49E-07	1.75E-07	2.12E-04	6.60E-07	1.83E-07	2.00E-05	0.00E+00	0.00E+00	0.00E+00	1.08E-06	5.84E-07	4.53E-07	2.33E-04	0.03	7.8E-01		
Benzo(b)fluoranthene	1-Scaling	3.42E-07	9.24E-08	1.12E-04	3.48E-07	9.67E-08	1.06E-05	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	1.23E-04	0.5	2.5E-02		
Benzo(g,h,i)perylene	1-Scaling	1.69E-06	4.57E-07	5.53E-04	1.72E-06	4.78E-07	5.22E-05	0.00E+00	0.00E+00	0.00E+00	1.08E-06	5.84E-07	4.53E-07	6.05E-04	0.5	1.2E-01		
Benzo(k)fluoranthene	1-Scaling	5.35E-07	1.45E-07	1.75E-04	5.44E-07	1.51E-07	1.65E-05	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	1.92E-04	0.5	3.8E-02		
Beryllium	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-05	5.84E-06	4.53E-06	4.53E-06	0.02	2.3E-02		
Butanes	3-Butanes, chemical-specific													519 (Routine), 58927 (MSS)	519 (Routine), 58927 (MSS)	66000	7.9E-01 (Routine), 8.9E+01 (MSS)	
Cadmium	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-03	5.51E-04	4.28E-04	4.28E-04	0.1	4.3E-01		
Carbon Tetrachloride	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.58E-05	5.33E-05	1.76E-02	0.00E+00	0.00E+00	0.00E+00	1.76E-02	130	1.4E-02		
Chlorobenzene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.34E-05	3.88E-05	1.28E-02	0.00E+00	0.00E+00	0.00E+00	1.28E-02	460	2.8E-03		
Chloroform	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.55E-05	4.13E-05	1.36E-02	0.00E+00	0.00E+00	0.00E+00	1.36E-02	100	1.4E-02		
Chromium	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-03	7.13E-04	5.53E-04	5.53E-04	3.6	1.5E-02		
Chrysene	1-Scaling	1.22E-06	3.30E-07	3.99E-04	1.24E-06	3.44E-07	3.76E-05	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07	4.37E-04	0.5	8.7E-02		
Cobalt	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.82E-05	4.21E-05	3.27E-05	3.27E-05	0.2	1.6E-02		
Dibenzo(a,h)anthracene	1-Scaling	2.01E-06	5.43E-07	6.57E-04	2.05E-06	5.69E-07	6.22E-05	0.00E+00	0.00E+00	0.00E+00	1.08E-06	5.84E-07	4.53E-07	7.20E-04	0.5	1.4E-01		
Dichlorobenzene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-03	5.84E-04	4.53E-04	4.53E-04	600	7.5E-05		
Ethylbenzene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.42E-05	7.47E-05	2.46E-02	0.00E+00	0.00E+00	0.00E+00	2.46E-02	740	3.3E-03		
Ethylene Dibromide	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.52E-05	6.42E-05	2.12E-02	0.00E+00	0.00E+00	0.00E+00	2.12E-02	4	5.3E-01		
Fluoranthene	1-Scaling	2.63E-05	7.11E-06	8.60E-03	2.67E-05	7.42E-06	8.10E-04	0.00E+00	0.00E+00	0.00E+00	2.71E-06	1.46E-06	1.13E-06	9.41E-03	0.5	1.9E+00		

US EPA ARCHIVE DOCUMENT

	Maximum 1-hr Total VOC Concentration ($\mu\text{g}/\text{m}^3$)
ENG07	1209.68174
ENG08	109.2132
ENG09	329.97643
Group NATGAS	0.77577

Chemical	Group for Modeling	ENG07			ENG08			ENG09			Group NATGAS			Chemical-Specific Modeling	Overall Model Results		
		Speciated Emissions	Emissions as Wt. Frac. Of VOC	Maximum Off-Property Concentration	Speciated Emissions	Emissions as Wt. Frac. Of VOC	Maximum Off-Property Concentration	Speciated Emissions	Emissions as Wt. Frac. Of VOC	Maximum Off-Property Concentration	Speciated Emissions	Emissions as Wt. Frac. Of VOC	Maximum Off-Property Concentration	Maximum Off-Property Concentration	Cumulative Maximum Off-Property Concentration	ESL	Concentration as % of ESL
		(lb/hr)	(-)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	(%)									
Fluorene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-06	1.33E-06	1.03E-06		1.03E-06	10	1.0E-05
Formaldehyde	1-Scaling	4.07E-03	1.10E-03	1.33E+00	4.14E-03	1.15E-03	1.26E-01	5.31E-02	6.17E-02	2.04E+01	6.62E-02	3.57E-02	2.77E-02		2.19E+01	15	1.5E+02
H ₂ S	4-H ₂ S, chemical-specific													0.02	2.00E-02	108	1.9E-02
Hexanes+	5-Hexanes+, chemical-specific													149 (Routine) 8550 (MSS)	149 (Routine) 8550 (MSS)	5300	2.8E+00 (Routine), 1.6E+02 (MSS)
Indeno(1,2,3-cd)pyrene	1-Scaling	1.29E-06	3.49E-07	4.22E-04	1.32E-06	3.67E-07	4.00E-05	0.00E+00	0.00E+00	0.00E+00	1.68E-06	9.08E-07	7.04E-07		4.63E-04	0.5	9.3E-02
Manganese	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.43E-04	1.85E-04	1.43E-04		1.43E-04	2	7.2E-03
Methanol	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.93E-03	9.22E-03	3.04E+00	0.00E+00	0.00E+00	0.00E+00		3.04E+00	2620	1.2E-01
Methylene Chloride	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-04	1.24E-04	4.11E-02	0.00E+00	0.00E+00	0.00E+00		4.11E-02	3600	1.1E-03
Mercury	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.29E-04	1.23E-04	9.56E-05		9.56E-05	0.1	9.6E-02
Naphthalene	1-Scaling	2.93E-04	7.92E-05	9.58E-02	2.98E-04	8.28E-05	9.04E-03	2.51E-04	2.92E-04	9.63E-02	5.54E-04	2.98E-04	2.31E-04		2.01E-01	200	1.0E-01
Nickel	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-03	1.04E-03	8.05E-04		8.05E-04	0.33	2.4E-01
PAH	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.65E-04	4.24E-04	1.40E-01	0.00E+00	0.00E+00	0.00E+00		1.40E-01	0.5	2.8E+01
Pentanes	6-Pentanes, chemical-specific													283 (Routine), 16176 (MSS)	283 (Routine), 16176 (MSS)	4100	6.9E+00 (Routine), 3.9E+02 (MSS)
Phenanthrene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.56E-05	8.43E-06	6.54E-06		6.54E-06	0.5	1.3E-03
Pyrene	1-Scaling	1.65E-05	4.46E-06	5.39E-03	1.68E-05	4.67E-06	5.10E-04	0.00E+00	0.00E+00	0.00E+00	4.51E-06	2.43E-06	1.89E-06		5.91E-03	0.5	1.2E+00
Selenium	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.23E-05	1.20E-05	9.30E-06		9.30E-06	2	4.7E-04
Styrene	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-05	3.58E-05	1.18E-02	0.00E+00	0.00E+00	0.00E+00		1.18E-02	110	1.1E-02
Toluene	1-Scaling	1.41E-03	3.81E-04	4.61E-01	1.44E-03	4.00E-04	4.37E-02	1.45E-03	1.69E-03	5.56E-01	3.07E-03	1.65E-03	1.28E-03		1.06E+00	3470	3.1E-02
Vinyl Chloride	1-Scaling	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-05	2.16E-05	7.14E-03	0.00E+00	0.00E+00	0.00E+00		7.14E-03	20000	3.6E-05
Xylenes	1-Scaling	9.83E-04	2.66E-04	3.21E-01	1.00E-03	2.78E-04	3.03E-02	5.05E-04	5.87E-04	1.94E-01	0.00E+00	0.00E+00	0.00E+00		5.45E-01	350	1.6E-01

US EPA ARCHIVE DOCUMENT

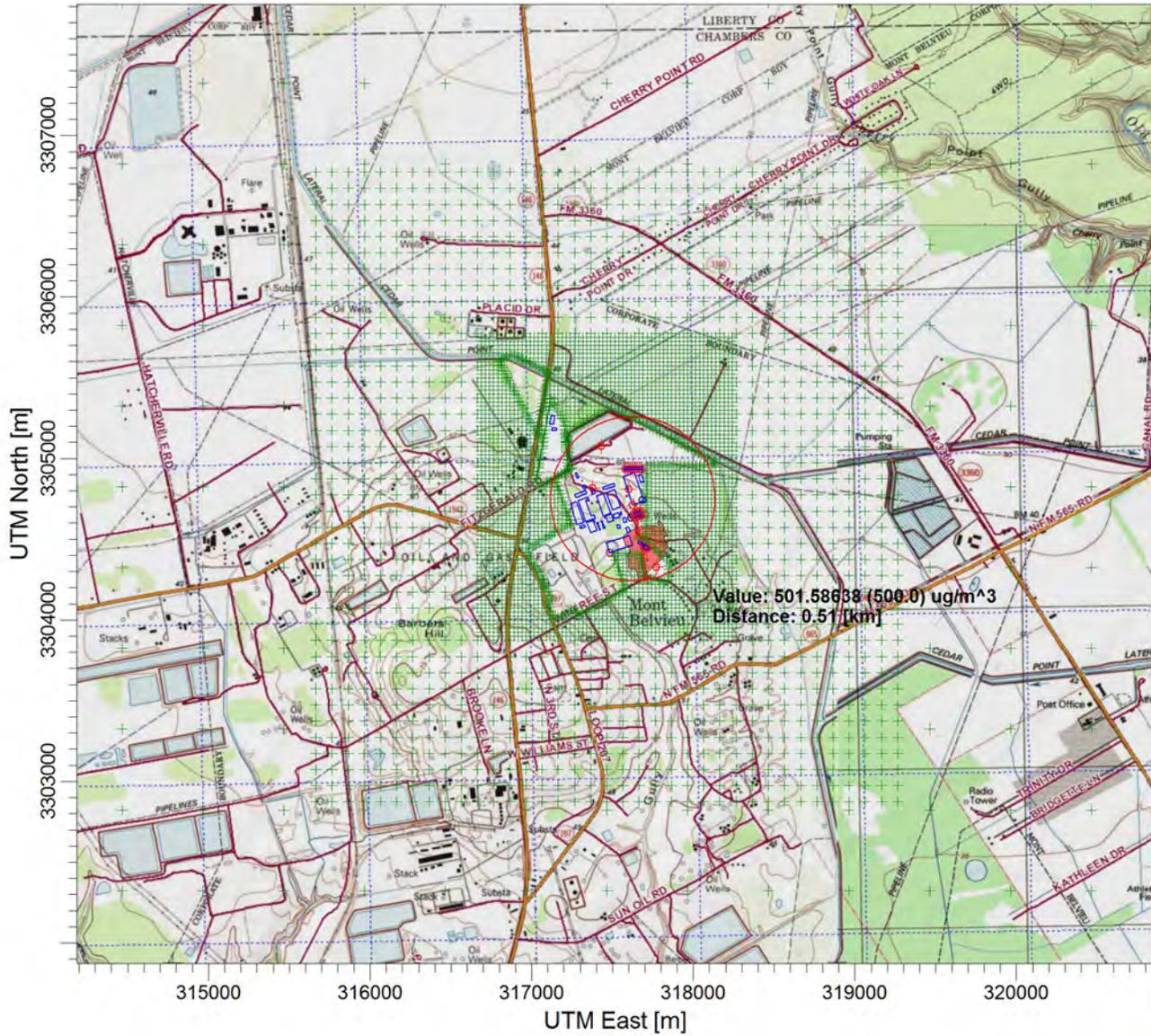
SECTION 14.0

MODELING CONCENTRATION PLOTS

The following modeling concentration plots include each pollutant and averaging time with project impacts above the applicable SIL. Frequency of ESL exceedance plots are also included for pentanes and hexanes+.

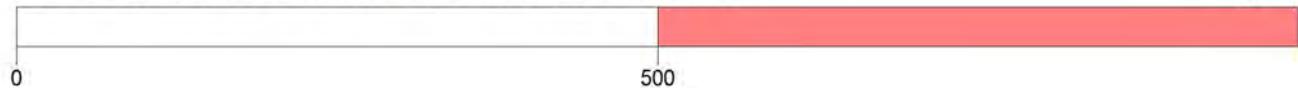
PROJECT TITLE:

**ONEOK - MB4 and MB5
 8-hr CO**



PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

5775

OUTPUT TYPE:

SCALE: 1:41,862

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

831.94918 ug/m³

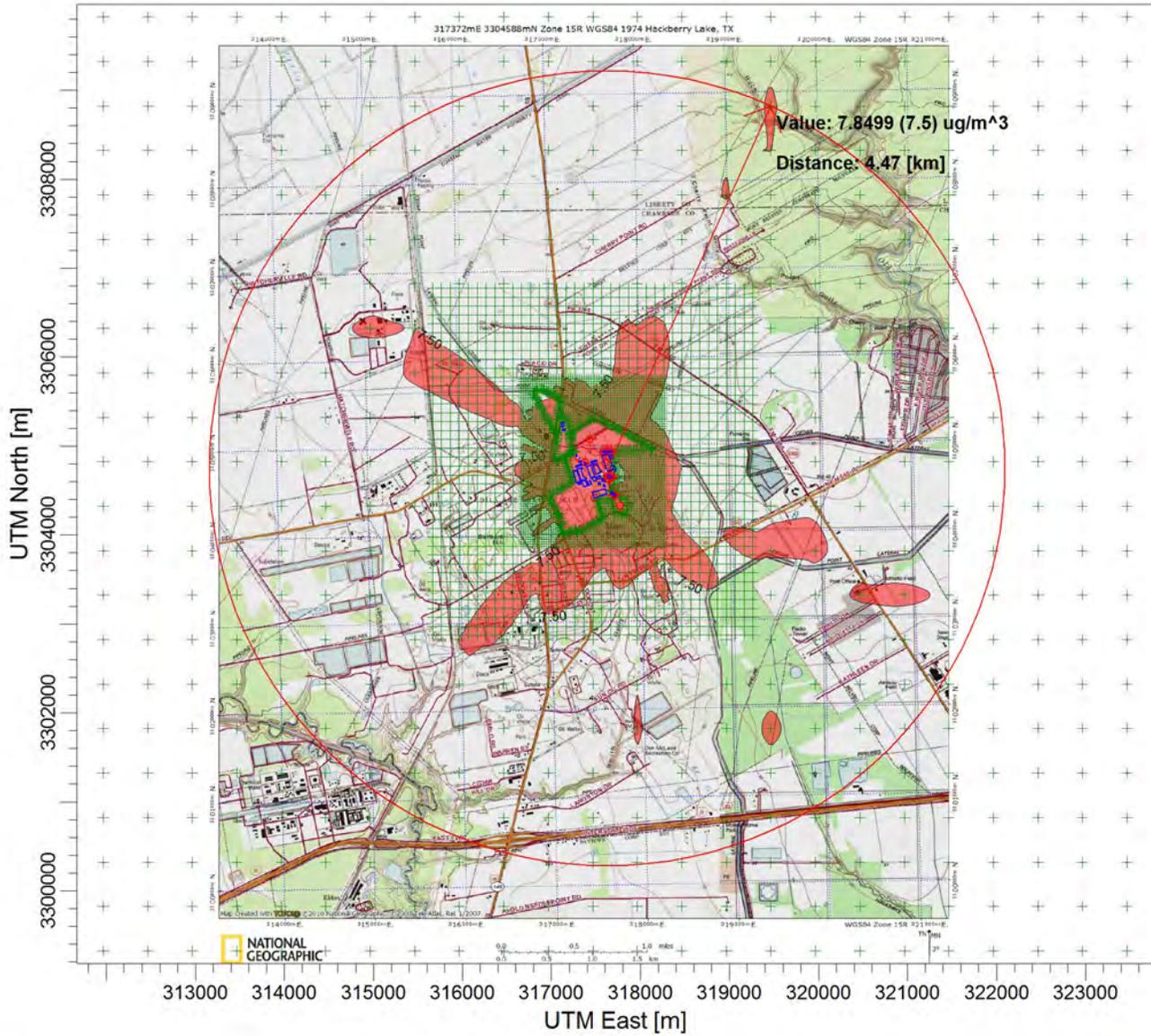
1/13/2014



US EPA ARCHIVE DOCUMENT

PROJECT TITLE:

**ONEOK - MB4 and MB5
 1-hr NO2**



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

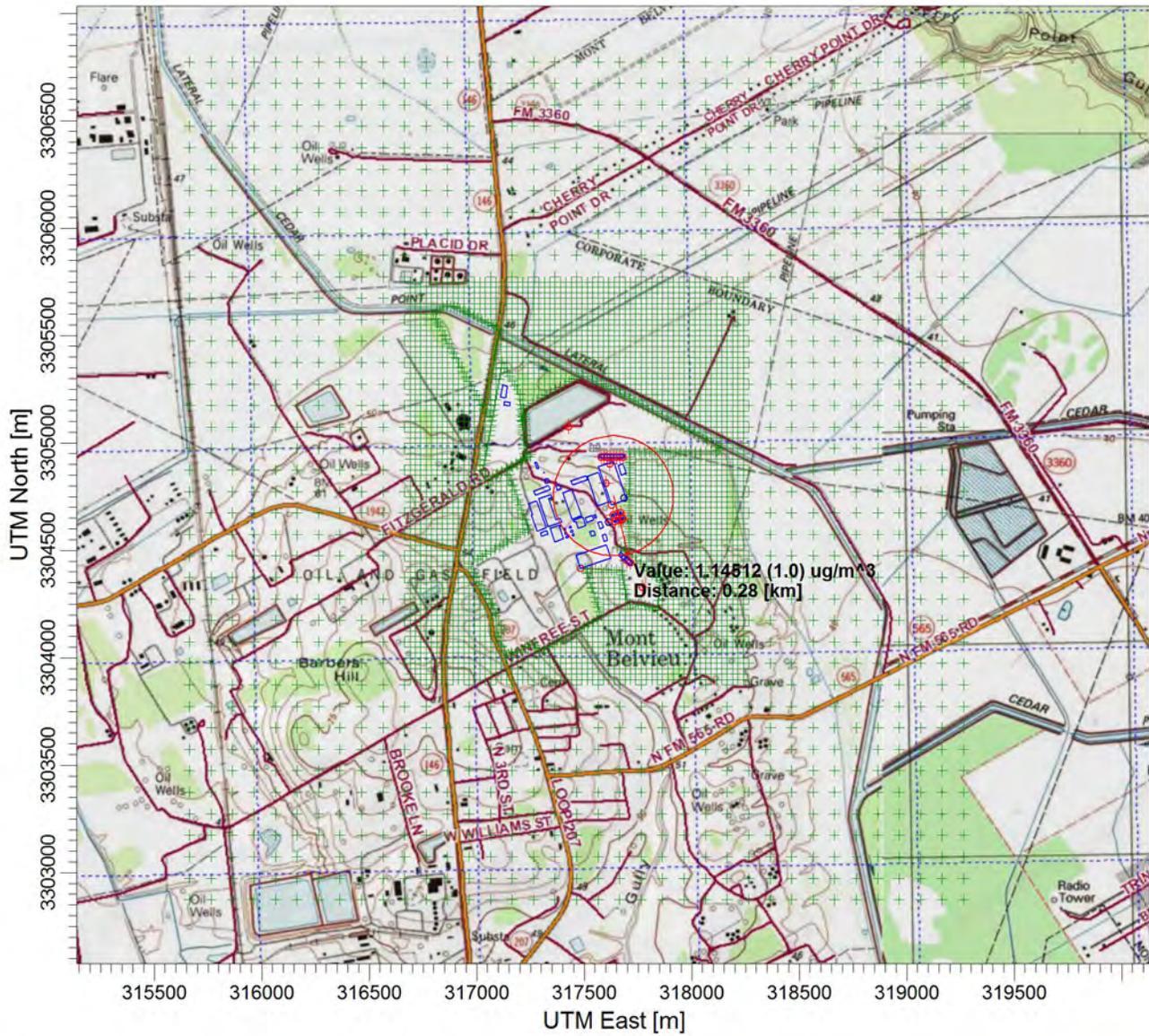
ug/m³



COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 5775	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:75,997	
	MAX: 12.32143 ug/m³	DATE: 1/13/2014	PROJECT NO.:

PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual NO2 - 2008**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:31,411

Concentration



MAX:

DATE:

PROJECT NO.:

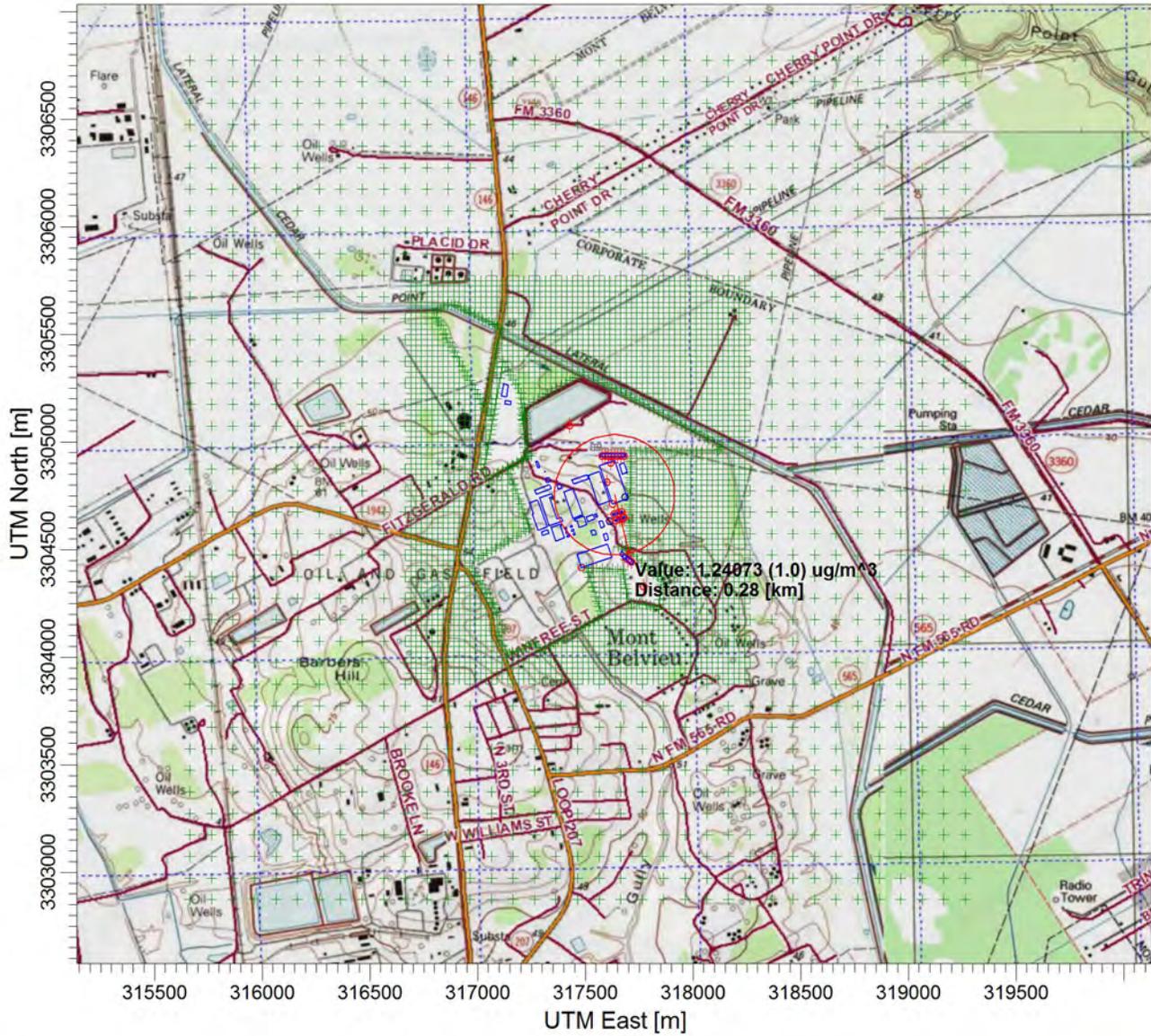
1.14512 ug/m³

12/1/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual NO2 - 2009**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:31,411

Concentration



MAX:

DATE:

PROJECT NO.:

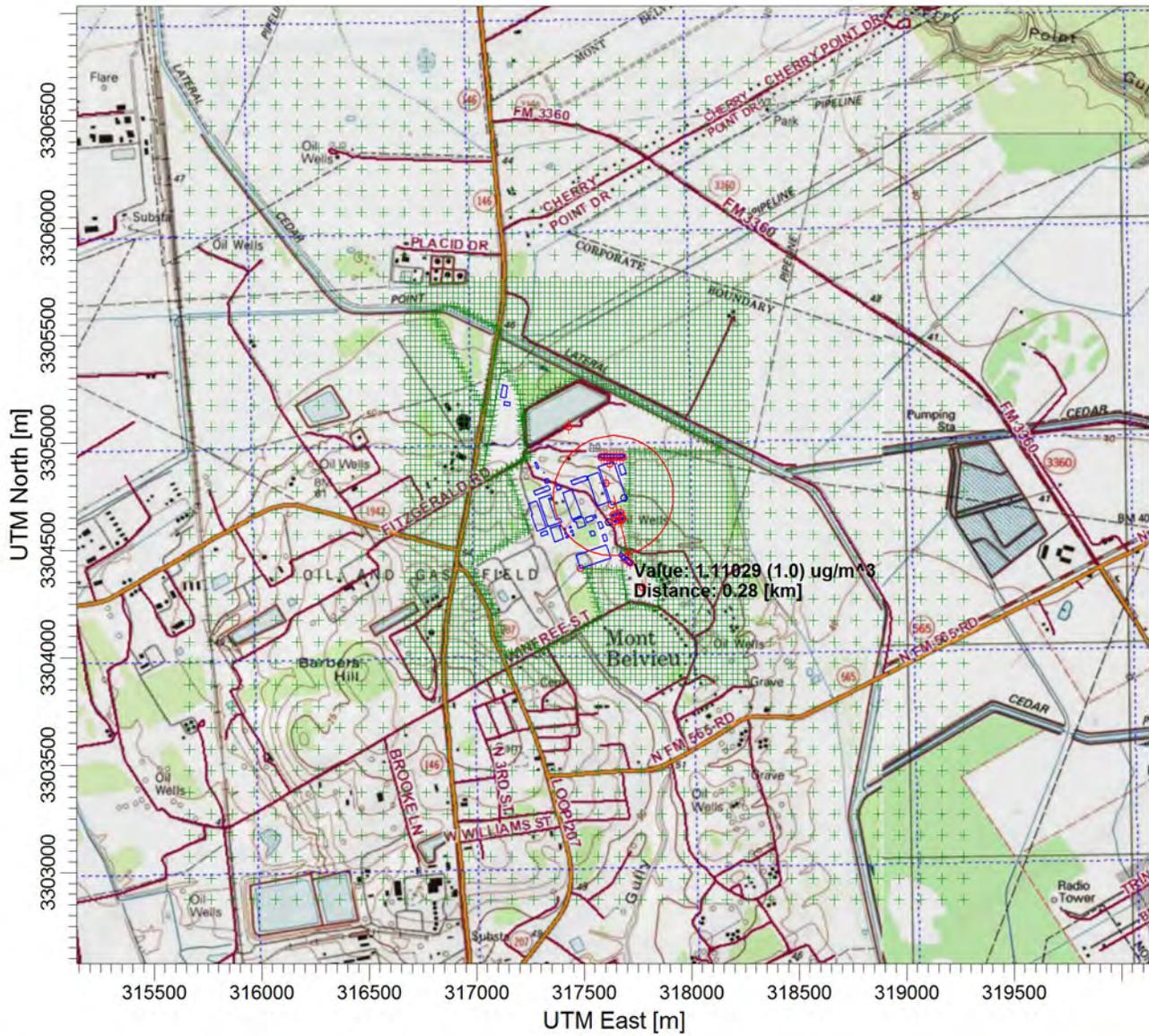
1.24073 ug/m³

12/1/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual NO2 - 2010**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:31,411

Concentration



MAX:

DATE:

PROJECT NO.:

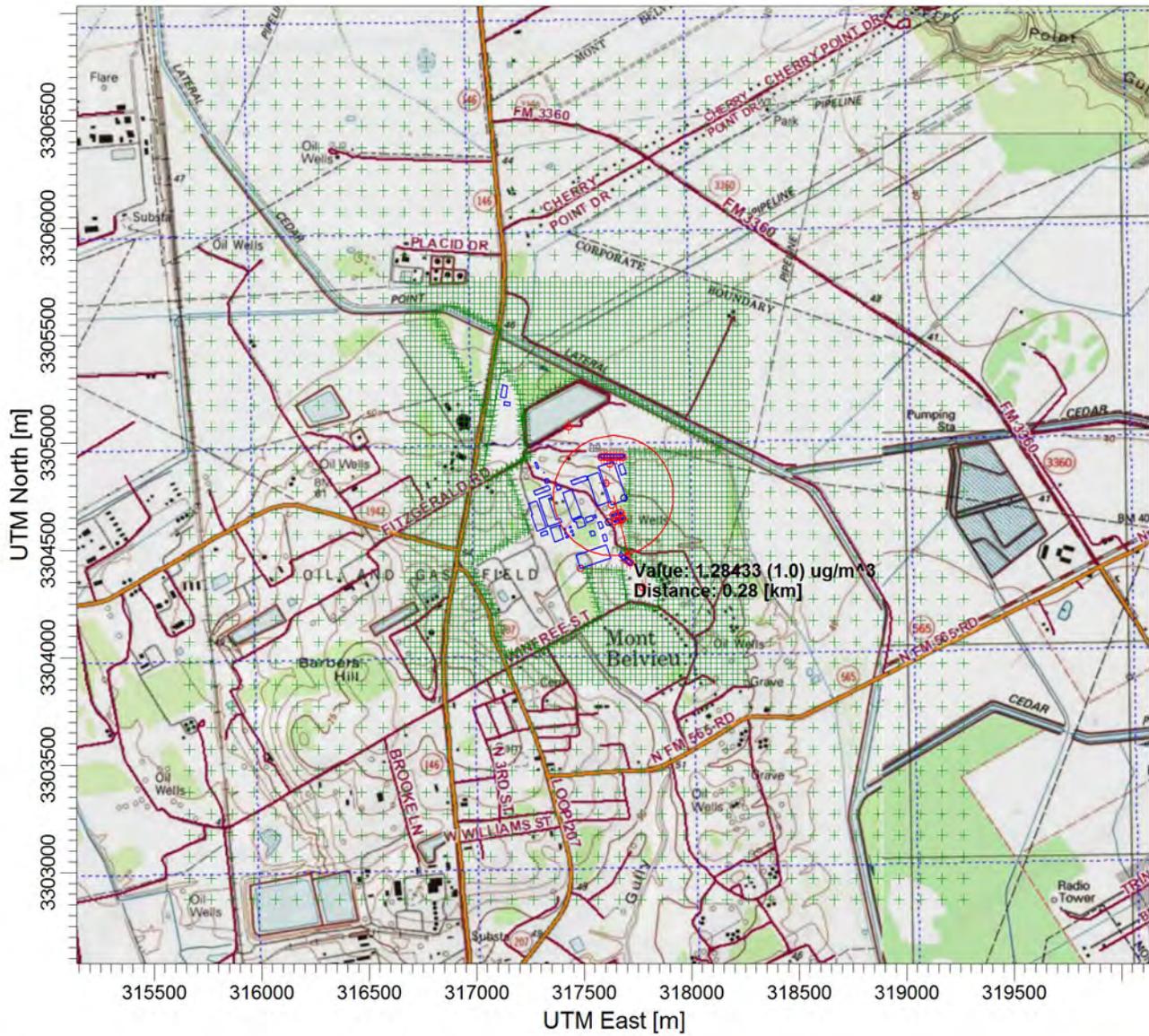
1.11029 ug/m³

12/1/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual NO2 - 2012**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³

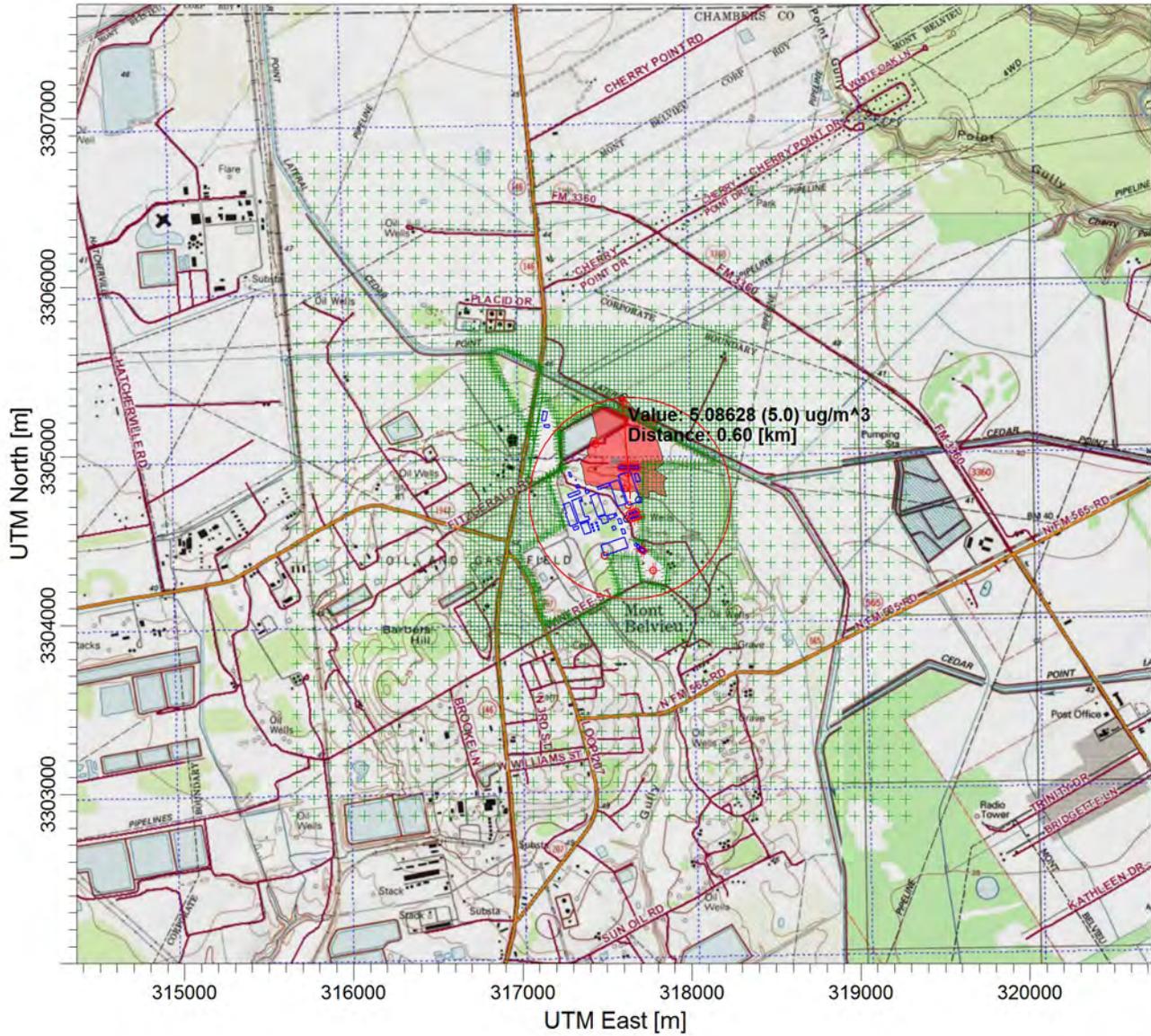


COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:31,411 0  1 km	
	MAX: 1.28433 ug/m³	DATE: 12/1/2013	PROJECT NO.:

US EPA ARCHIVE DOCUMENT

PROJECT TITLE:

**ONEOK - MB4 and MB5
 24-hr PM10**



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:40,015

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

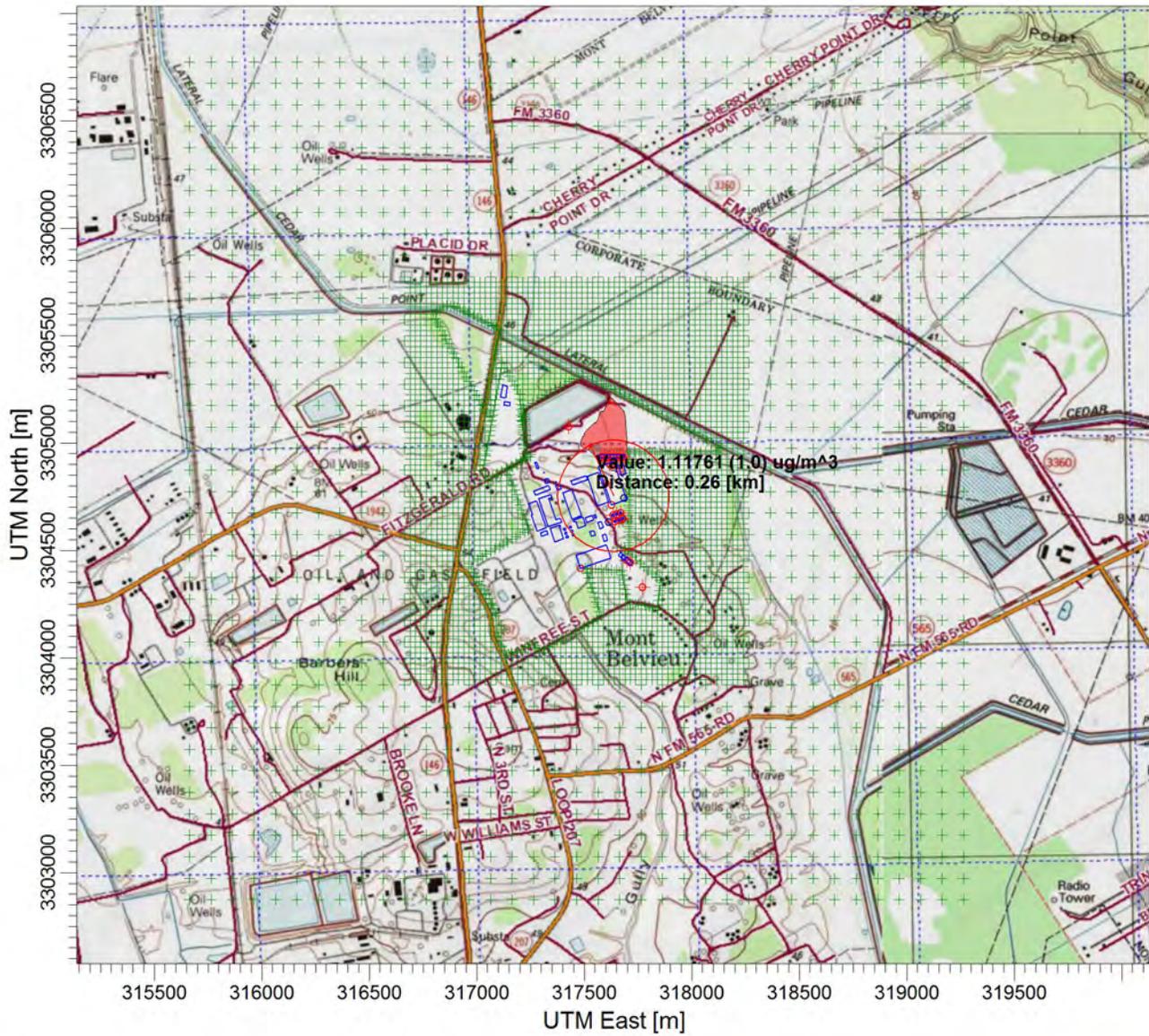
13.16862 ug/m³

11/27/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM10 - 2008**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³

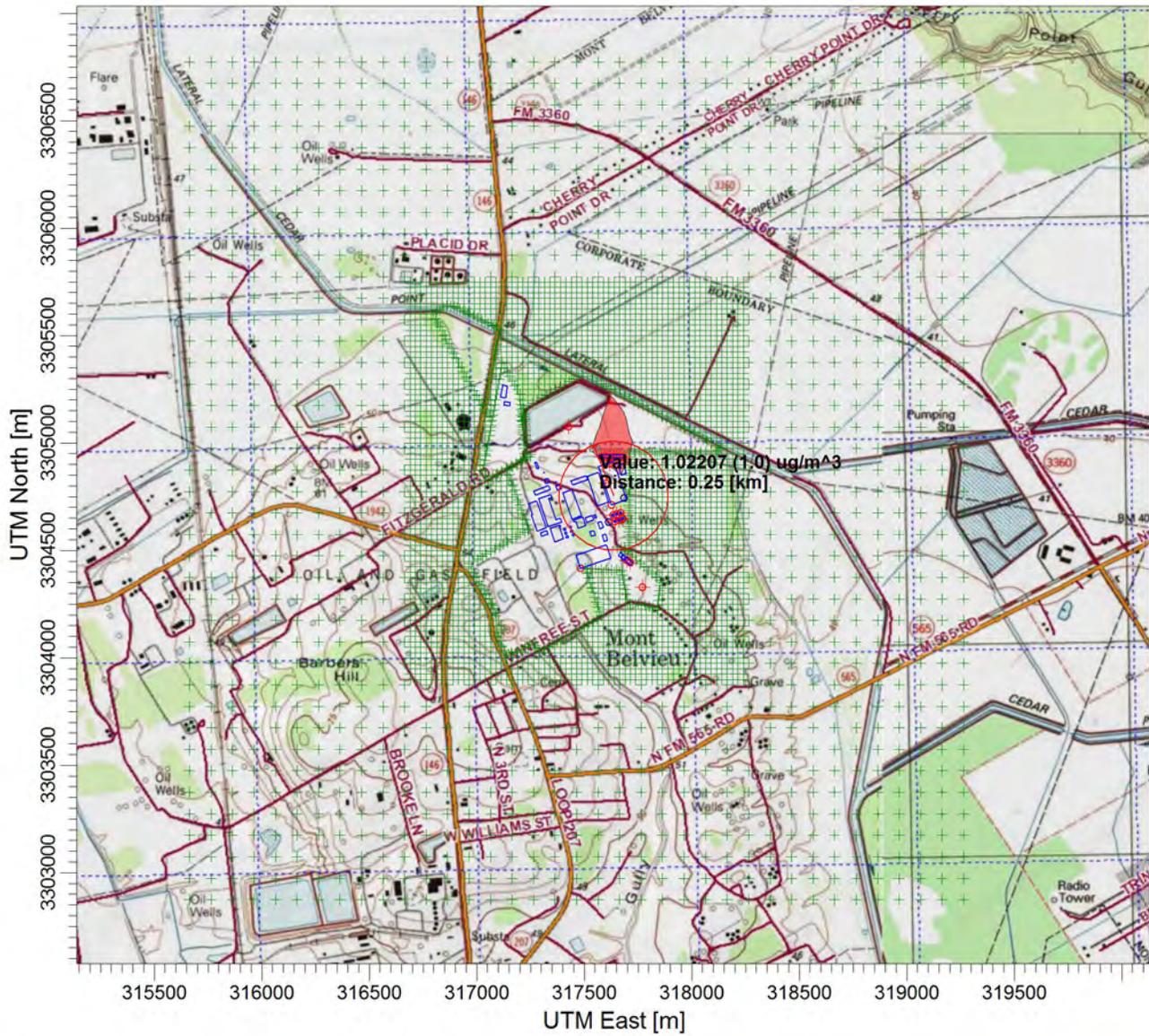


COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:31,411	
	MAX: 2.4941 ug/m³		
	DATE: 12/1/2013	PROJECT NO.:	

US EPA ARCHIVE DOCUMENT

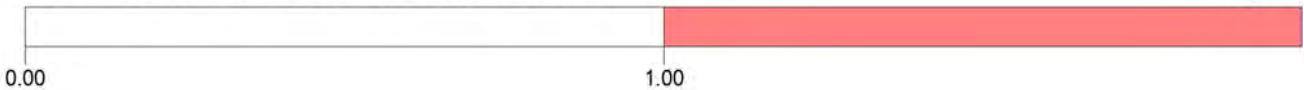
PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM10 - 2009**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:31,411

Concentration



MAX:

DATE:

PROJECT NO.:

2.03375 ug/m³

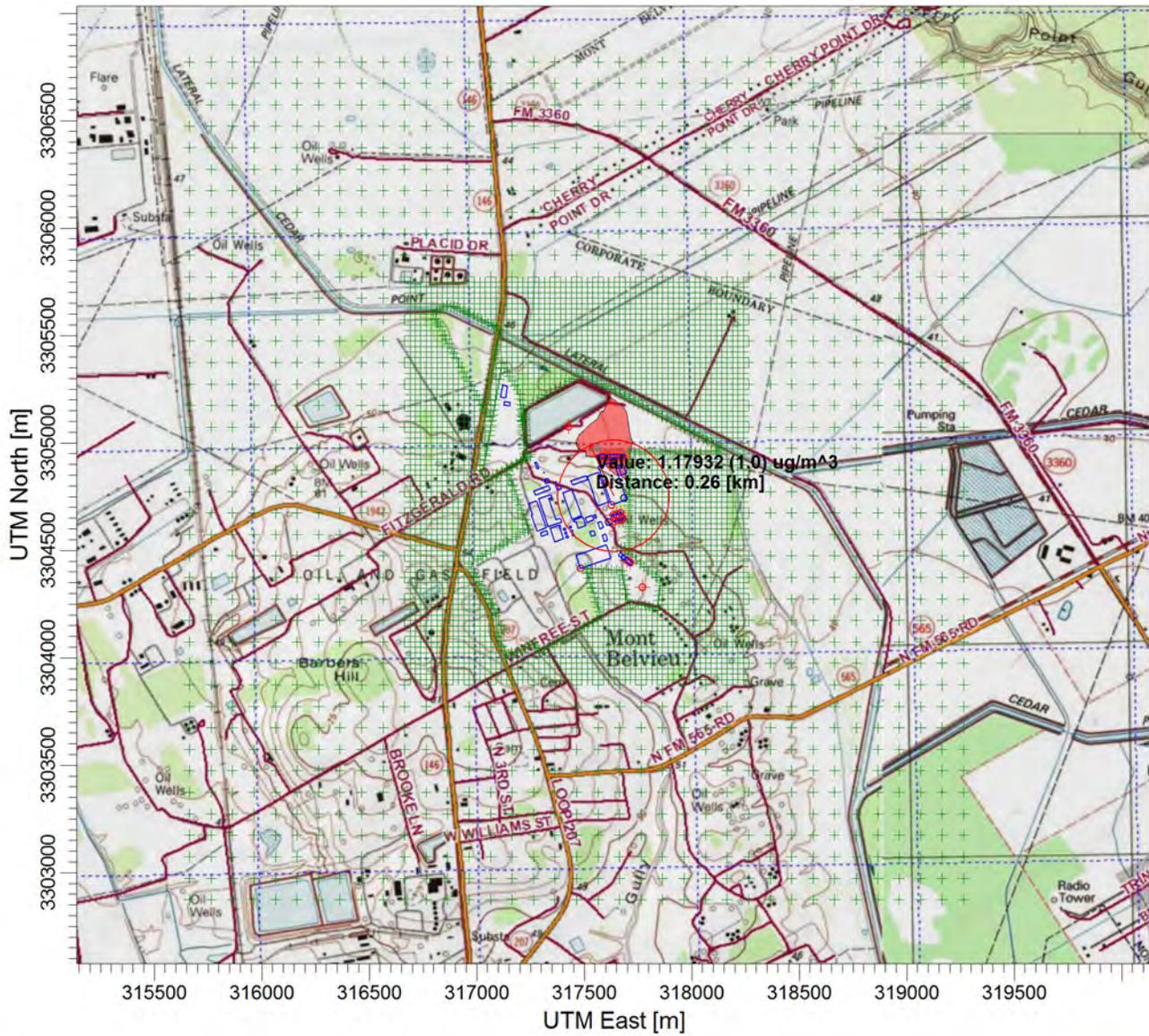
12/1/2013



US EPA ARCHIVE DOCUMENT

PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM10 - 2010**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:31,411

Concentration



MAX:

DATE:

PROJECT NO.:

2.50779 ug/m³

12/1/2013

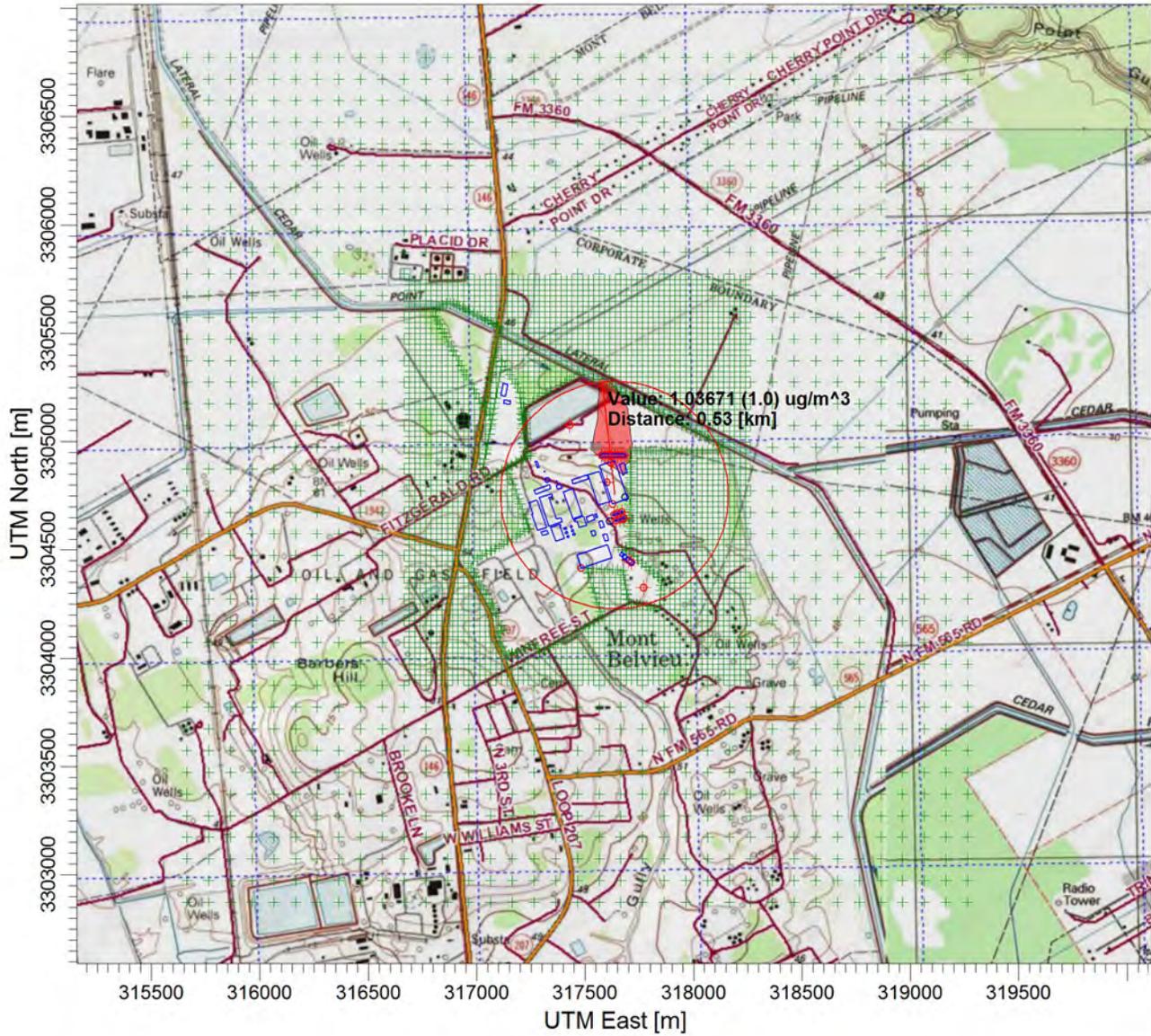


US EPA ARCHIVE DOCUMENT

PROJECT TITLE:

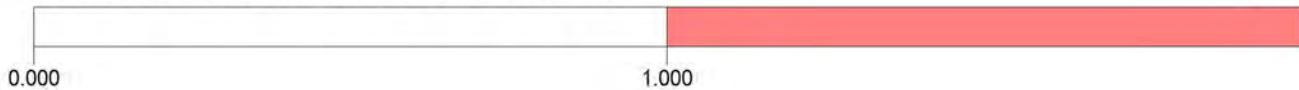
**ONEOK - MB4 and MB5
 Annual PM10 - 2011**

US EPA ARCHIVE DOCUMENT



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:31,202 0 1 km	
	MAX: 2.23538 ug/m³	DATE: 11/30/2013	PROJECT NO.:

PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM10 - 2012**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

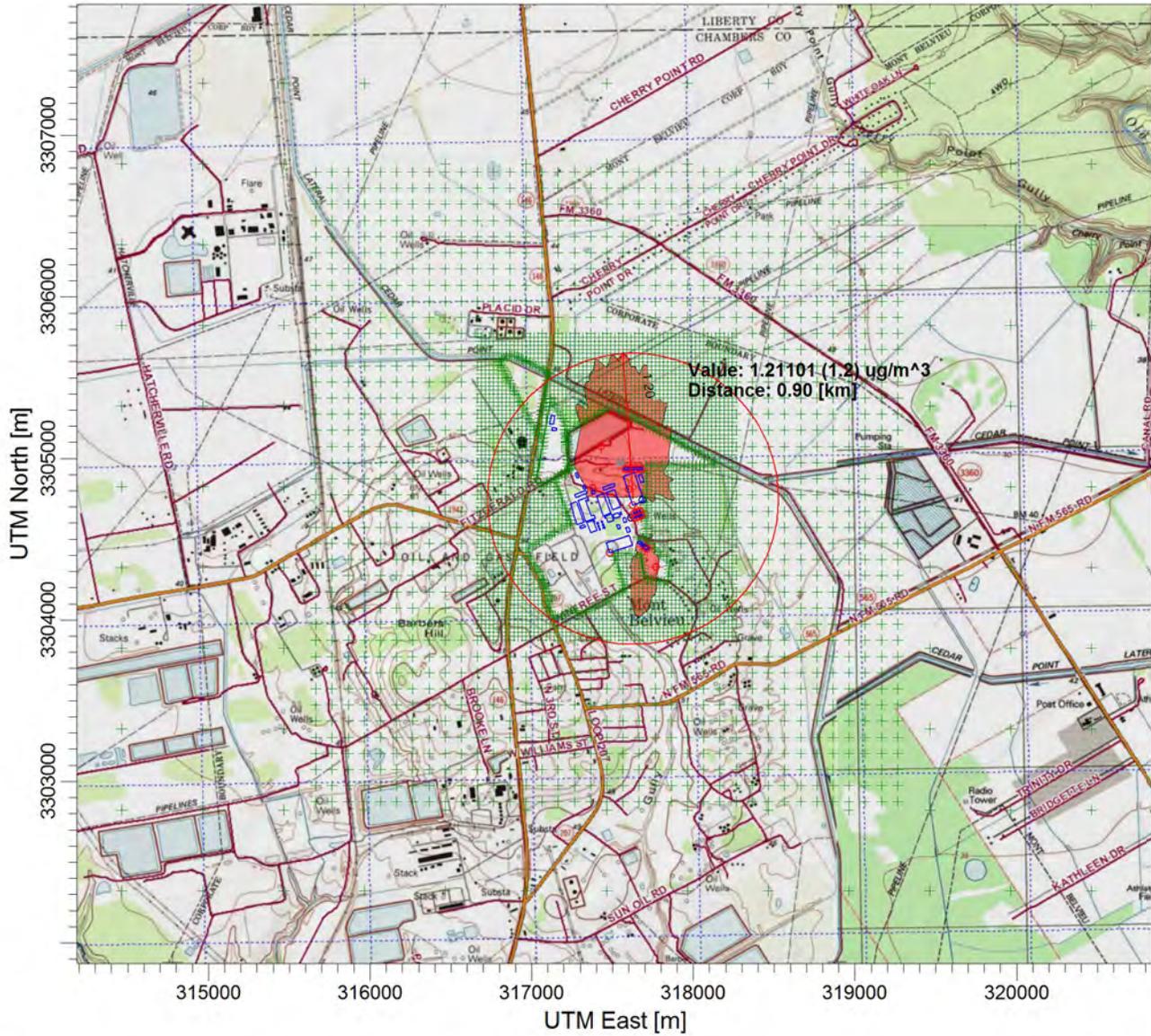
ug/m³



COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:36,694 0  1 km	
	MAX: 2.38761 ug/m³	DATE: 11/30/2013	

PROJECT TITLE:

**ONEOK - MB4 and MB5
 24-hr PM2.5**



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

5775

OUTPUT TYPE:

SCALE: 1:41,859

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

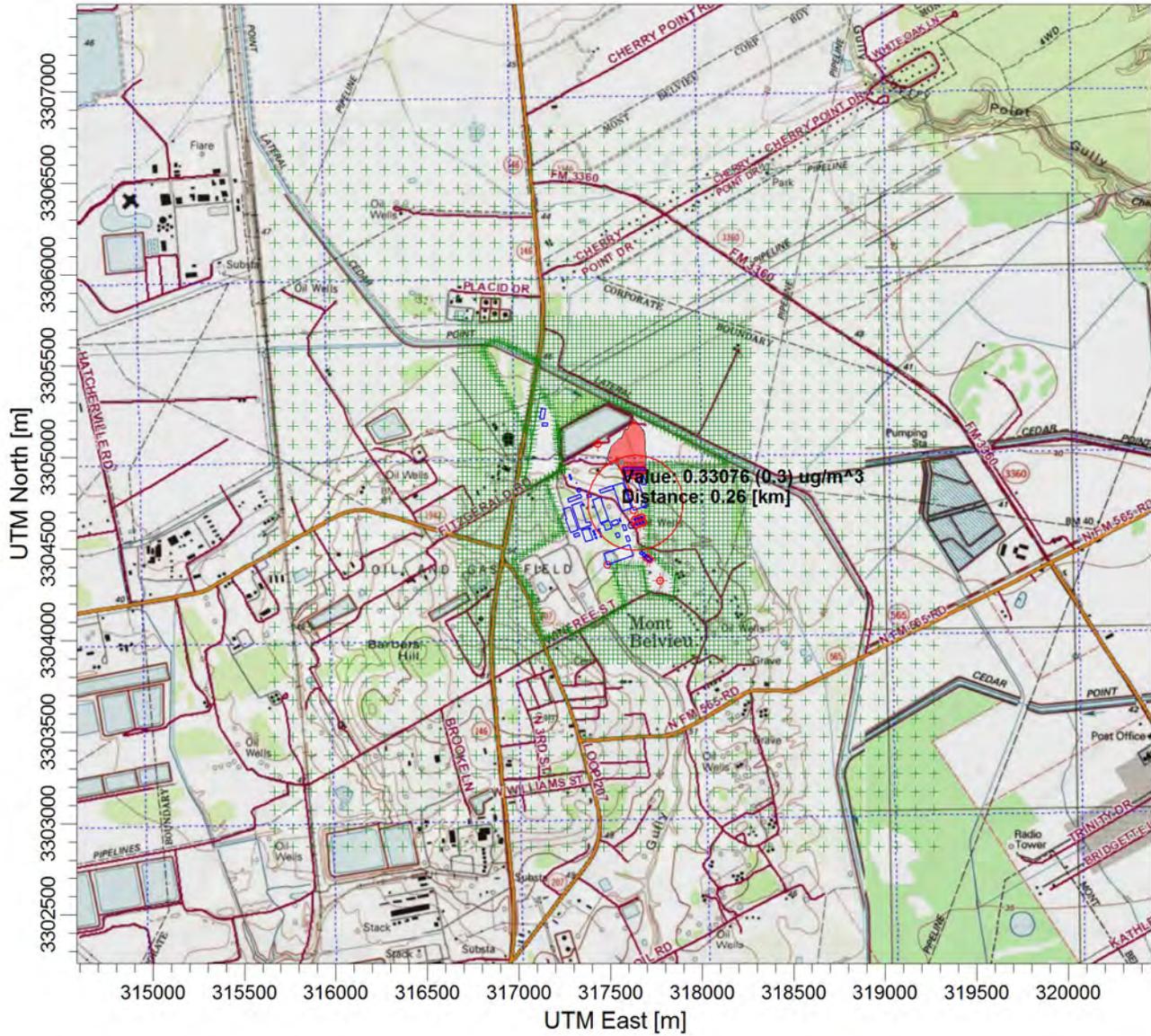
3.33776 ug/m³

1/14/2014



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM2.5 - 2008**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

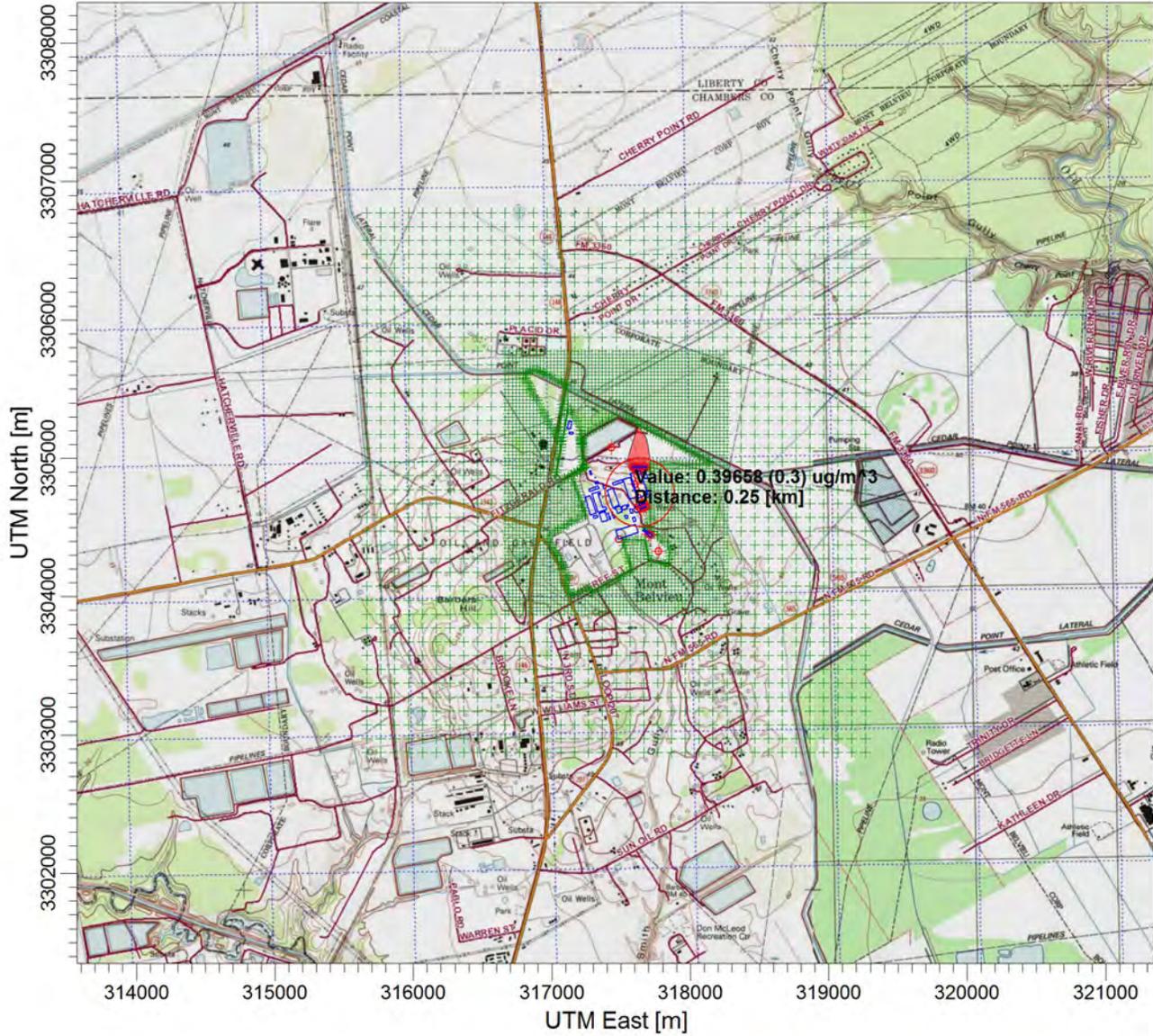
ug/m³



COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:36,949 0 1 km	
	MAX: 0.66493 ug/m³	DATE: 11/30/2013	

PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM2.5 - 2009**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 4983	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:48,944 0  1 km	
	MAX: 0.54609 ug/m³	DATE: 11/30/2013	PROJECT NO.:

PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM2.5 - 2010**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:36,708

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

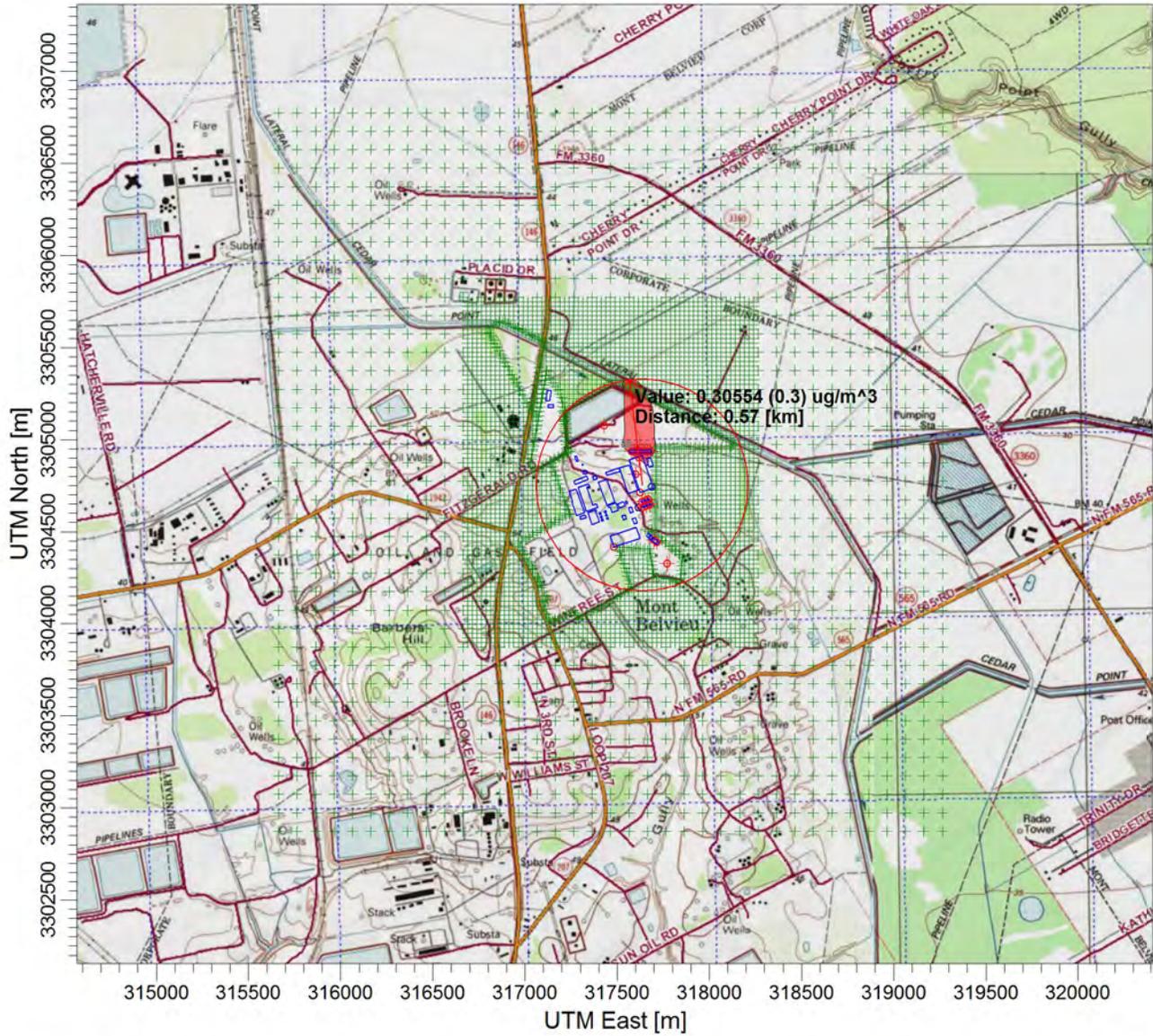
0.66074 ug/m³

11/30/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM2.5 - 2011**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:36,708

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

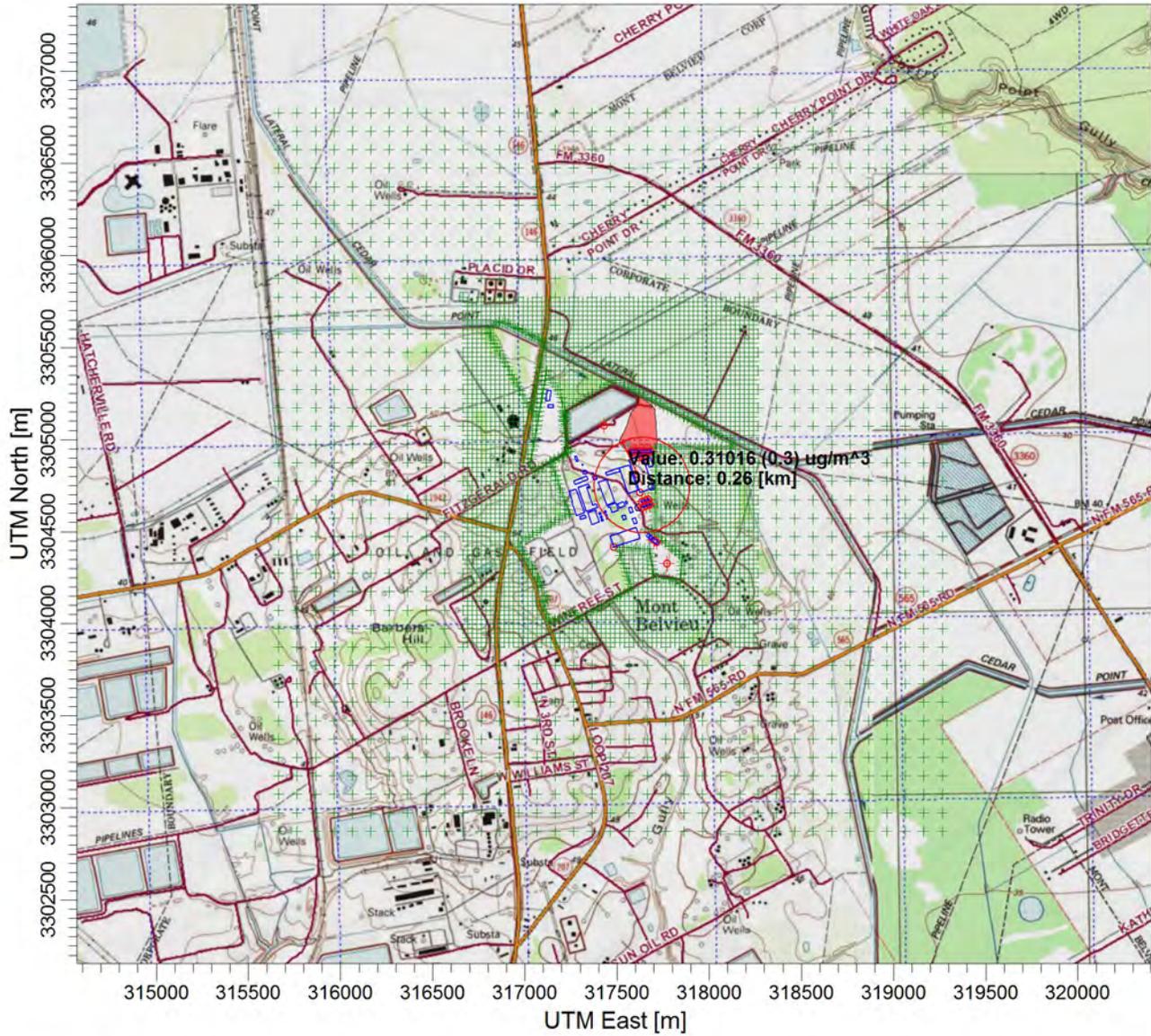
0.6059 ug/m³

11/30/2013



PROJECT TITLE:

**ONEOK - MB4 and MB5
 Annual PM2.5 - 2012**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

4983

OUTPUT TYPE:

SCALE: 1:36,708

Concentration

0 1 km

MAX:
0.62972 ug/m³

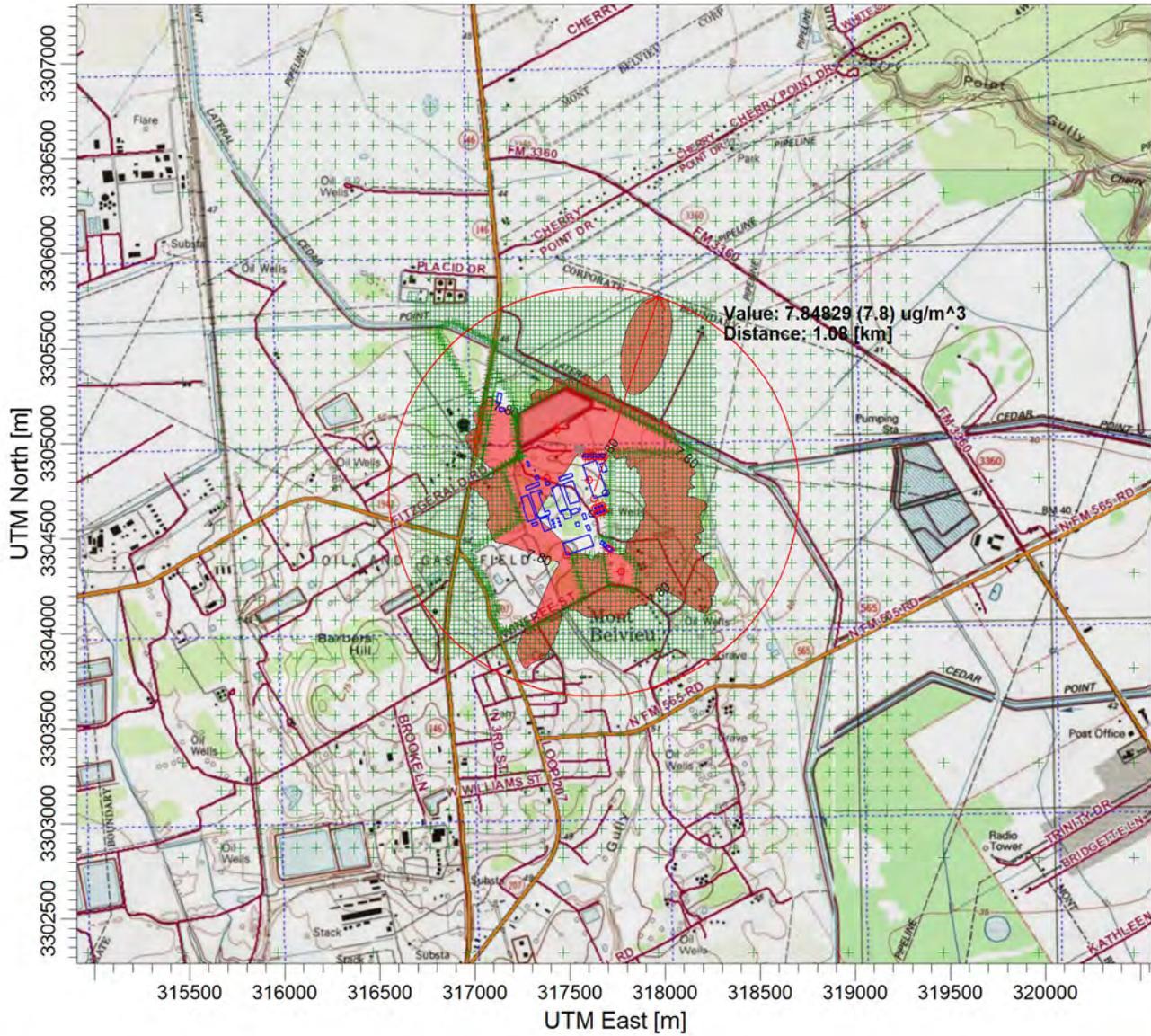
DATE:
11/30/2013

PROJECT NO.:



PROJECT TITLE:

**ONEOK - MB4 and MB5
 1-hr SO₂**



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m³



COMMENTS:

SOURCES:

COMPANY NAME:

24

RECEPTORS:

MODELER:

5775

OUTPUT TYPE:

SCALE: 1:35,581

Concentration

0 1 km

MAX:

DATE:

PROJECT NO.:

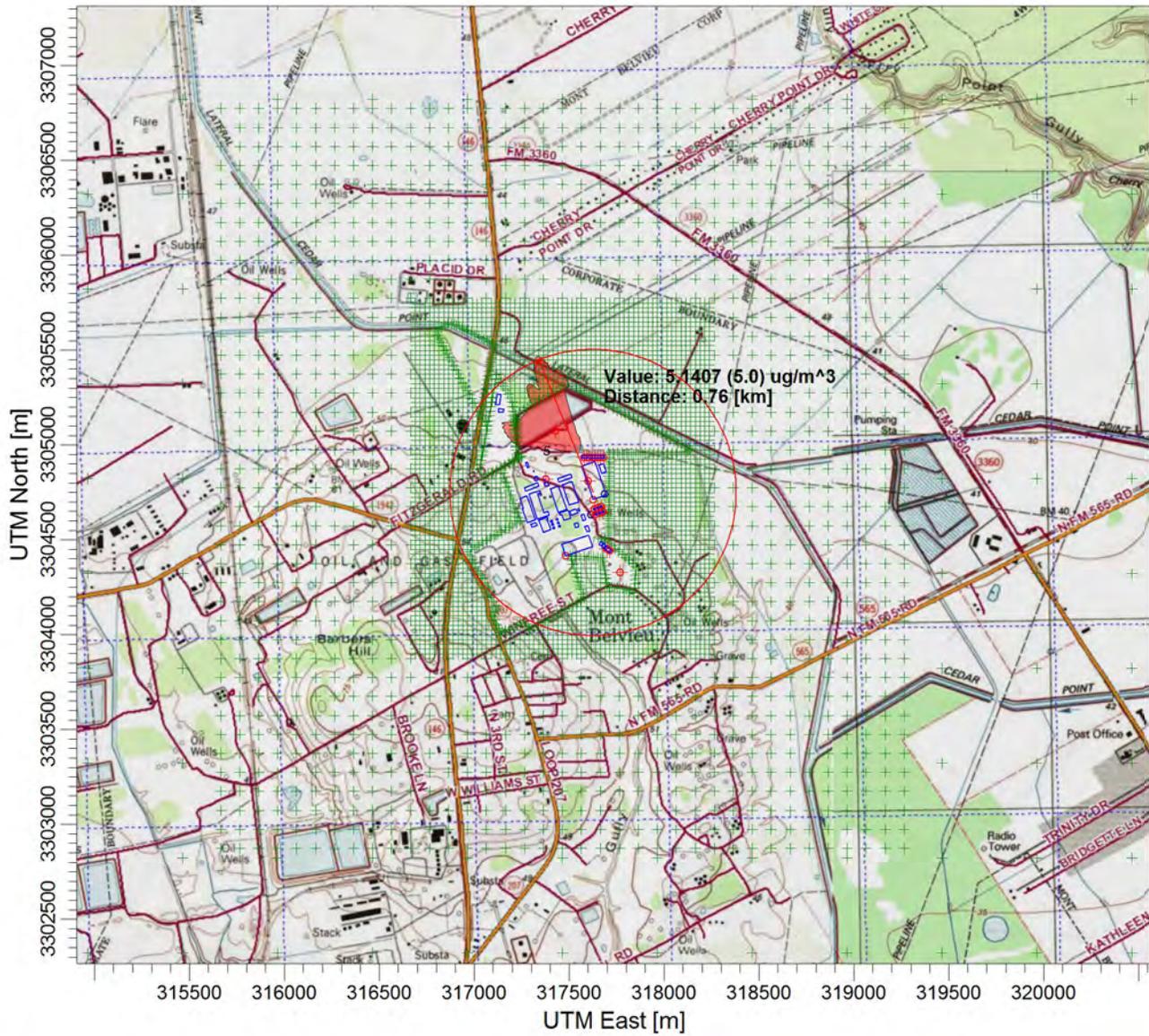
11.68714 ug/m³

1/14/2014



PROJECT TITLE:

**ONEOK - MB4 and MB5
 24-hr SO₂**



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m³

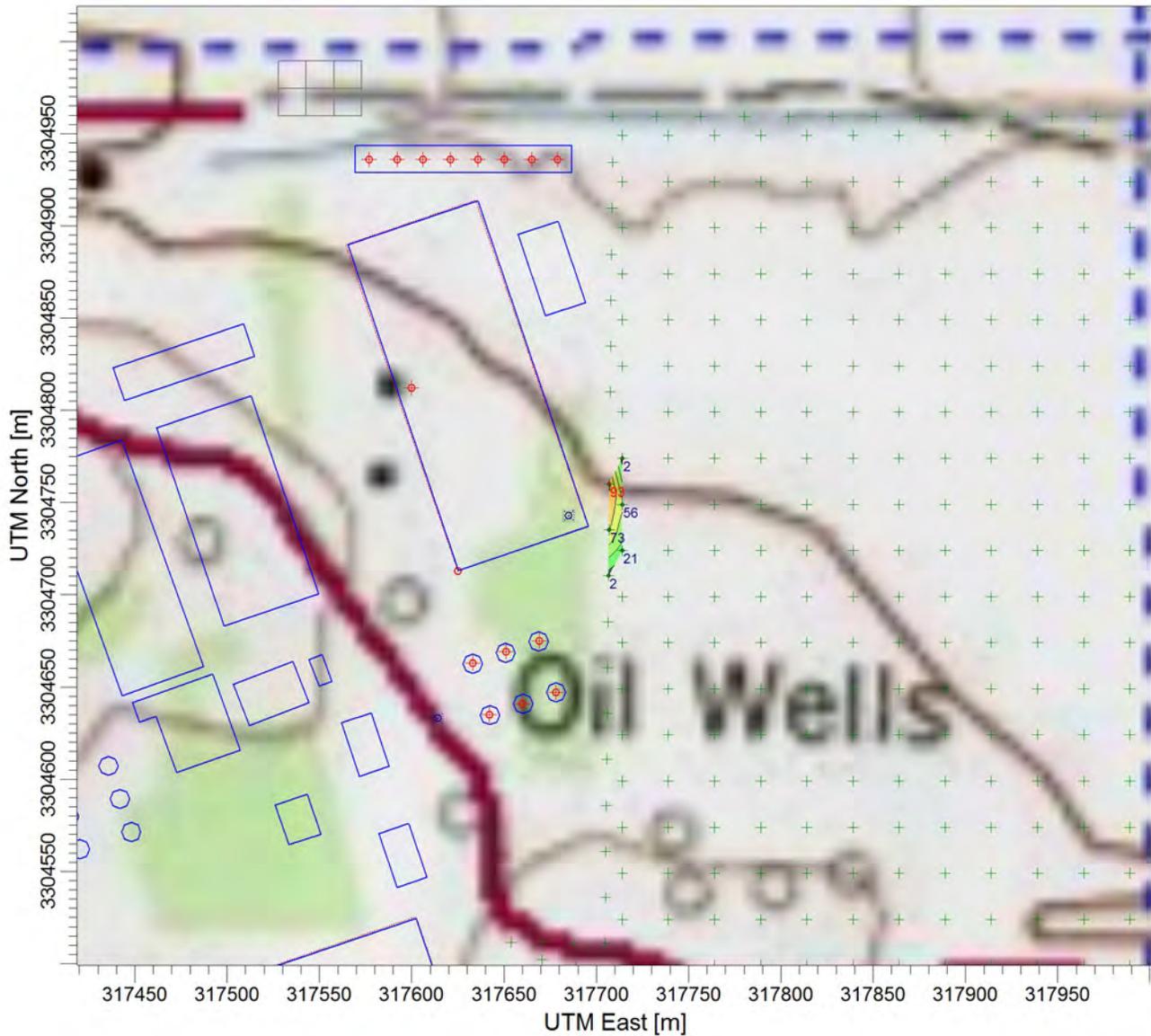


COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 5775	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:35,581	
	MAX: 6.33585 ug/m³	DATE: 1/15/2014	

US EPA ARCHIVE DOCUMENT

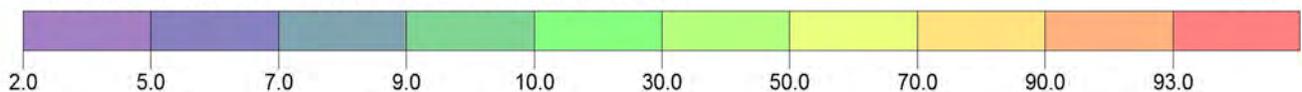
PROJECT TITLE:

ONEOK - MB4 and MB5
1-hr Hexanes+ Frequency of ESL Exceedance



EXCEEDANCE FILE FOR 1-HR VALUES \geq A THRESHOLD OF 5300.

COUNT

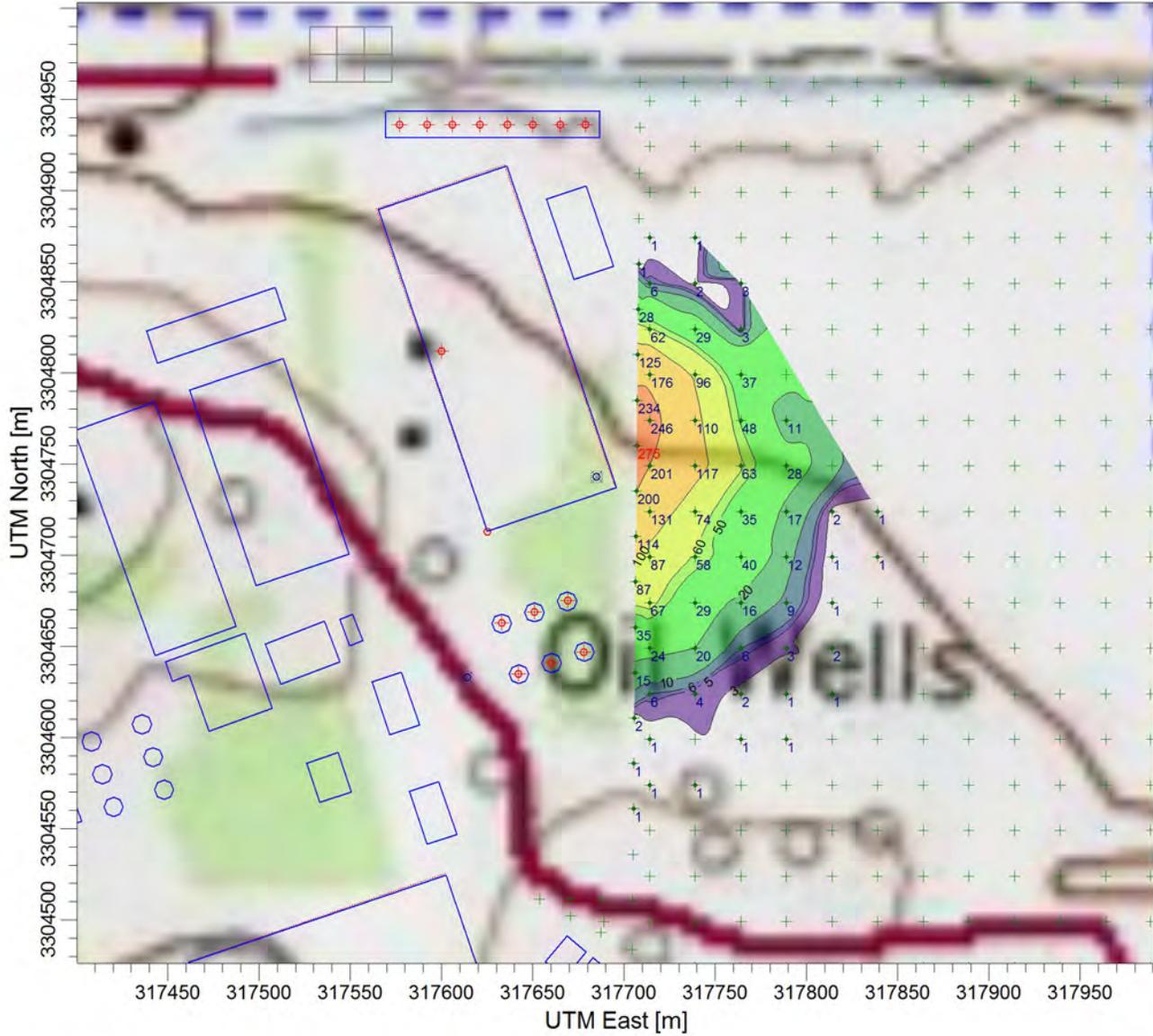


COMMENTS:	SOURCES: 24	COMPANY NAME:	
	RECEPTORS: 5775	MODELER:	
	OUTPUT TYPE: Concentration	SCALE: 1:3,665 0  0.1 km	
	MAX: 93 COUNT	DATE: 1/22/2014	PROJECT NO.:

US EPA ARCHIVE DOCUMENT

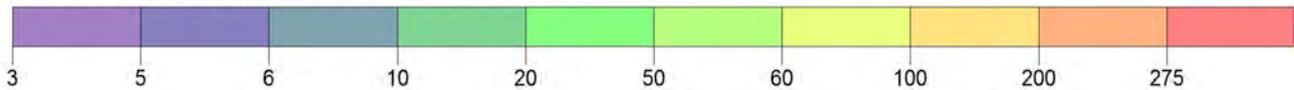
PROJECT TITLE:

ONEOK - MB4 and MB5
1-hr Pentanes Frequency of ESL Exceedance



EXCEEDANCE FILE FOR 1-HR VALUES \geq A THRESHOLD OF 4100.

COUNT



COMMENTS:

SOURCES:

24

COMPANY NAME:

RECEPTORS:

5775

MODELER:

OUTPUT TYPE:

Concentration

SCALE:

1:3,713

0 0.1 km



MAX:

275 COUNT

DATE:

1/30/2014

PROJECT NO.:

SECTION 15.0

CD

Model input/output and associated electronic files are provided on a CD.

APPENDIX A

MODELING INPUT TABLES

Modeled Release Parameters for Point Sources

UTM Zone 15

EPN	MODEL ID	DESCRIPTION	UTM	UTM	HEIGHT		DIAMETER		VELOCITY		TEMPERATURE	
			EAST	NORTH	(ft)	(m)	(ft)	(m)	(ft/sec)	(m/sec)	(° F)	(° K)
			(m)	(m)								
H-07	H07	Hot Oil Heater 7	317633	3304663	146.33	44.6	8.33	2.54	25	7.62	305	425
H-08	H08	Hot Oil Heater 8	317651	3304669	146.33	44.6	8.33	2.54	25	7.62	305	425
H-09	H09	Hot Oil Heater 9	317669	3304675	146.33	44.6	8.33	2.54	25	7.62	305	425
H-10	H10	Hot Oil Heater 10	317642	3304635	146.33	44.6	8.33	2.54	25	7.62	305	425
H-11	H11	Hot Oil Heater 11	317660	3304641	146.33	44.6	8.33	2.54	25	7.62	305	425
H-12	H12	Hot Oil Heater 12	317678	3304647	146.33	44.6	8.33	2.54	25	7.62	305	425
FL-02	FL02	Frac-3 and Frac-4 Flare	317769	3304328	210	64	1.22	0.372	65.6	20	1832	1270
CT-05-1	CT051	Frac-3 Cooling Tower (Cell 1)	317577	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-05-2	CT052	Frac-3 Cooling Tower (Cell 2)	317592	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-05-3	CT053	Frac-3 Cooling Tower (Cell 3)	317606	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-05-4	CT054	Frac-3 Cooling Tower (Cell 4)	317621	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-06-1	CT061	Frac-4 Cooling Tower (Cell 1)	317636	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-06-2	CT062	Frac-4 Cooling Tower (Cell 2)	317650	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-06-3	CT063	Frac-4 Cooling Tower (Cell 3)	317665	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
CT-06-4	CT064	Frac-4 Cooling Tower (Cell 4)	317679	3304936	30	9.14	30	9.14	15	4.57	Amb.	0
LOAD-SC-3	LOADSC3	Spent Caustic Loading (Frac-3 and Frac-4)	317600	3304812	12	3.66	0.00328	0.001	0.00328	0.001	Amb.	0
LOAD-WW-3	LOADWW3	Wastewater Loading (Frac-3 and Frac-4)	317376	3304819	12	3.66	0.00328	0.001	0.00328	0.001	Amb.	0
ENG-07	ENG07	Frac-3 and Frac-4 Emergency Air Compressor	317699	3304454	8	2.44	0.5	0.152	100	30.5	800	700
ENG-08	ENG08	Frac-3 and Frac-4 Firewater Pump	317427	3305077	8	2.44	0.67	0.204	100	30.5	800	700
ENG-09	ENG09	Frac-3 and Frac-4 Emergency Generator	317713	3304443	8	2.44	0.42	0.128	100	30.5	800	700

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Flare - Effective Stack Diameter

$$D = (10^{-6} q_n)^{1/2}$$

$$q_n = q (1 - 0.048 (MW)^{1/2})$$

$$q = 2,500,000 \text{ Btu/hr}$$

$$= 175,000 \text{ cal/sec}$$

$$MW = 18.7 \text{ lb/lb-mol}$$

$$q_n = 138,675 \text{ cal/sec}$$

$$D = 0.372 \text{ m}$$

Flare - Effective Stack Diameter for 1-hr and 8-hr CO Modeling and 1-hr Chemical-Specific VOC Modeling

$$D = (10^{-6} q_n)^{1/2}$$

$$q_n = q (1 - 0.048 (MW)^{1/2})$$

$$q = 1,221,161,400 \text{ Btu/hr}$$

$$= 85,481,298 \text{ cal/sec}$$

$$MW = 22.8 \text{ lb/lb-mol}$$

$$q_n = 65,889,253 \text{ cal/sec}$$

$$D = 8.12 \text{ m}$$

Note: For all pollutants and averaging times except for 1-hr CO, 8-hr CO, 1-hr NO₂, and chemical-specific VOC the flare's effective stack diameter is calculated based on pilot gas only. This scenario produces the smallest calculated effective diameter, which results in the most conservative modeling result (poorest dispersion).

Modeled Release Parameters for Area Sources

UTM Zone 15

EPN	MODEL ID	DESCRIPTION	UTM EAST	UTM NORTH	RELEASE HEIGHT		LENGTH X-INIT		WIDTH Y-INIT		AREA	ANGLE
			(m)	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(m ²)	(°E of N)
FUG-04	FUG04	Frac-3 Fugitives	317625	3304713	3	0.914	244	74.4	612	187	13900	-18.6
FUG-05	FUG05	Frac-4 Fugitives	317482	3304417	3	0.914	488	149	208	63.4	9450	-18.6

Modeled Release Parameters for Volume Sources

UTM Zone 15

EPN	MODEL ID	DESCRIPTION	UTM EAST	UTM NORTH	SIDE LENGTH		VERTICAL SOURCE DIMENSION		RELEASE HEIGHT		SY-INIT	SZ-INIT	VOLUME SOURCE TYPE
			(m)	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(m)	(m)	
MSS-FUG-3	MSSFUG3	MSS-Degassing (Frac-3 and Frac-4)	317685	3304743	20	6.1	30	9.14	15	4.57	1.42	4.25	Surface-based, single volume source
MSS-FUG-3	MSSNH3FU	MSS-Degassing (NH ₃ , Frac-3 and Frac-4)	317614	3304633	20	6.1	6	1.83	3	0.914	1.42	0.851	Surface-based, single volume source

Volume Source Notes:

Release height is assumed to be 1/2 of vertical source dimension.

Divisors for SY-INIT and SZ-INIT are defined based on volume source type, per AERMOD User's Guide, dated September 2004.

$$SY-INIT = (6.1 \text{ m side length}) / (4.3)$$

$$= 1.42 \text{ m}$$

$$SZ-INIT = (9.14 \text{ m vertical source dimension}) / (2.15)$$

$$= 4.25 \text{ m}$$

Modeled Emission Rates for Criteria Pollutant Emission Sources

EPN	MODEL ID	DESCRIPTION	1-hr CO		8-hr CO		1-hr NO ₂		Annual NO ₂			24-hr and Annual PM ₁₀		24-hr PM _{2.5}		Annual PM _{2.5}		1-hr and 3-hr SO ₂		24-hr SO ₂		Annual SO ₂		
			CO Emission Rate (lb/hr)	CO Emission Rate (g/sec)	CO Emission Rate (lb/hr)	CO Emission Rate (g/sec)	NO _x Emission Rate (lb/hr)	NO ₂ / NO _x Ratio (--)	NO ₂ Emission Rate (g/sec)	NO _x Emission Rate (ton/yr)	NO ₂ / NO _x Ratio (--)	NO ₂ Emission Rate (g/sec)	PM ₁₀ Emission Rate (lb/hr)	PM ₁₀ Emission Rate (g/sec)	PM _{2.5} Emission Rate (lb/hr)	PM _{2.5} Emission Rate (g/sec)	PM _{2.5} Emission Rate (ton/yr)	PM _{2.5} Emission Rate (g/sec)	SO ₂ Emission Rate (lb/hr)	SO ₂ Emission Rate (g/sec)	SO ₂ Emission Rate (lb/hr)	SO ₂ Emission Rate (g/sec)	SO ₂ Emission Rate (ton/yr)	SO ₂ Emission Rate (g/sec)
H-07	H07	Hot Oil Heater 7	5.76	0.73	46.1	5.8	1.54	0.8	0.16	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	0.11	0.014	0.11	0.014	0.44	0.013
H-08	H08	Hot Oil Heater 8	46.1	5.8	46.1	5.8	7.68	0.8	0.77	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	20.51	2.6	0.11	0.014	0.44	0.013
H-09	H09	Hot Oil Heater 9	46.1	5.8	46.1	5.8	7.68	0.8	0.77	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	0.11	0.014	20.51	2.6	0.44	0.013
H-10	H10	Hot Oil Heater 10	46.1	5.8	5.76	0.73	7.68	0.8	0.77	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	0.11	0.014	0.11	0.014	0.44	0.013
H-11	H11	Hot Oil Heater 11	5.76	0.73	5.76	0.73	1.54	0.8	0.16	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	0.11	0.014	0.11	0.014	0.44	0.013
H-12	H12	Hot Oil Heater 12	46.1	5.8	46.1	5.8	7.68	0.8	0.77	6.26	1	0.18	0.77	0.097	0.77	0.097	3.07	0.088	0.11	0.014	0.11	0.014	67.24	1.9
FL-02	FL02	Frac-3 and Frac-4 Flare	672.4	85	672.4	85	0.772	0.8	0.078	3.38	1	0.097	0	0	0	0	0	0	0.0018	0.00023	0.0018	0.00023	0.0079	0.00023
CT-05-1	CT051	Frac-3 Cooling Tower (Cell 1)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-05-2	CT052	Frac-3 Cooling Tower (Cell 2)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-05-3	CT053	Frac-3 Cooling Tower (Cell 3)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-05-4	CT054	Frac-3 Cooling Tower (Cell 4)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-06-1	CT061	Frac-4 Cooling Tower (Cell 1)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-06-2	CT062	Frac-4 Cooling Tower (Cell 2)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-06-3	CT063	Frac-4 Cooling Tower (Cell 3)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
CT-06-4	CT064	Frac-4 Cooling Tower (Cell 4)	0	0	0	0	0	0.8	0	0	1	0	0.12	0.015	0.03	0.0038	0.13	0.0037	0	0	0	0	0	0
ENG-07	ENG07	Frac-3 and Frac-4 Emergency Air Compressor	3.2	0.4	3.2	0.4	0.0434	0.8	0.0044	0.19	1	0.0055	0.19	0.002	0.19	0.002	0.0095	0.00027	0.0053	0.00067	0.0053	0.00067	0.00027	0.0000078
ENG-08	ENG08	Frac-3 and Frac-4 Firewater Pump	3.1	0.39	3.1	0.39	0.0411	0.8	0.0041	0.18	1	0.0052	0.18	0.0019	0.18	0.0019	0.009	0.00026	0.0054	0.00068	0.0054	0.00068	0.00027	0.0000078
ENG-09	ENG09	Frac-3 and Frac-4 Emergency Generator	3.2	0.4	3.2	0.4	0.0183	0.8	0.0018	0.08	1	0.0023	0.05	0.00053	0.05	0.00053	0.0025	0.000072	0.0015	0.00019	0.0015	0.00019	0.000075	0.0000022

Notes: Used 24-hr average PM10 emission rates as conservative inputs for annual PM10 modeling.
 Used annual average rate in 1-hr NO2 modeling demonstration for MSS flaring and EPNs ENG-07, ENG-08, and ENG-09 because they are intermittent sources.
 24-hr PM₁₀ and PM_{2.5} emissions for EPNs ENG-07, ENG-08, and ENG-09 have been adjusted to reflect a maximum of 2 hr/day of operation.

ENG-07, 24-hr PM_{2.5} =

$$\frac{0.19 \text{ lb PM}_{2.5}}{\text{hr}} \times \frac{2 \text{ hr operation}}{24 \text{ hr}} \times \frac{454 \text{ g}}{1 \text{ lb}} \times \frac{1 \text{ hr}}{3600 \text{ sec}} = 0.002 \text{ g/sec}$$

US EPA ARCHIVE DOCUMENT

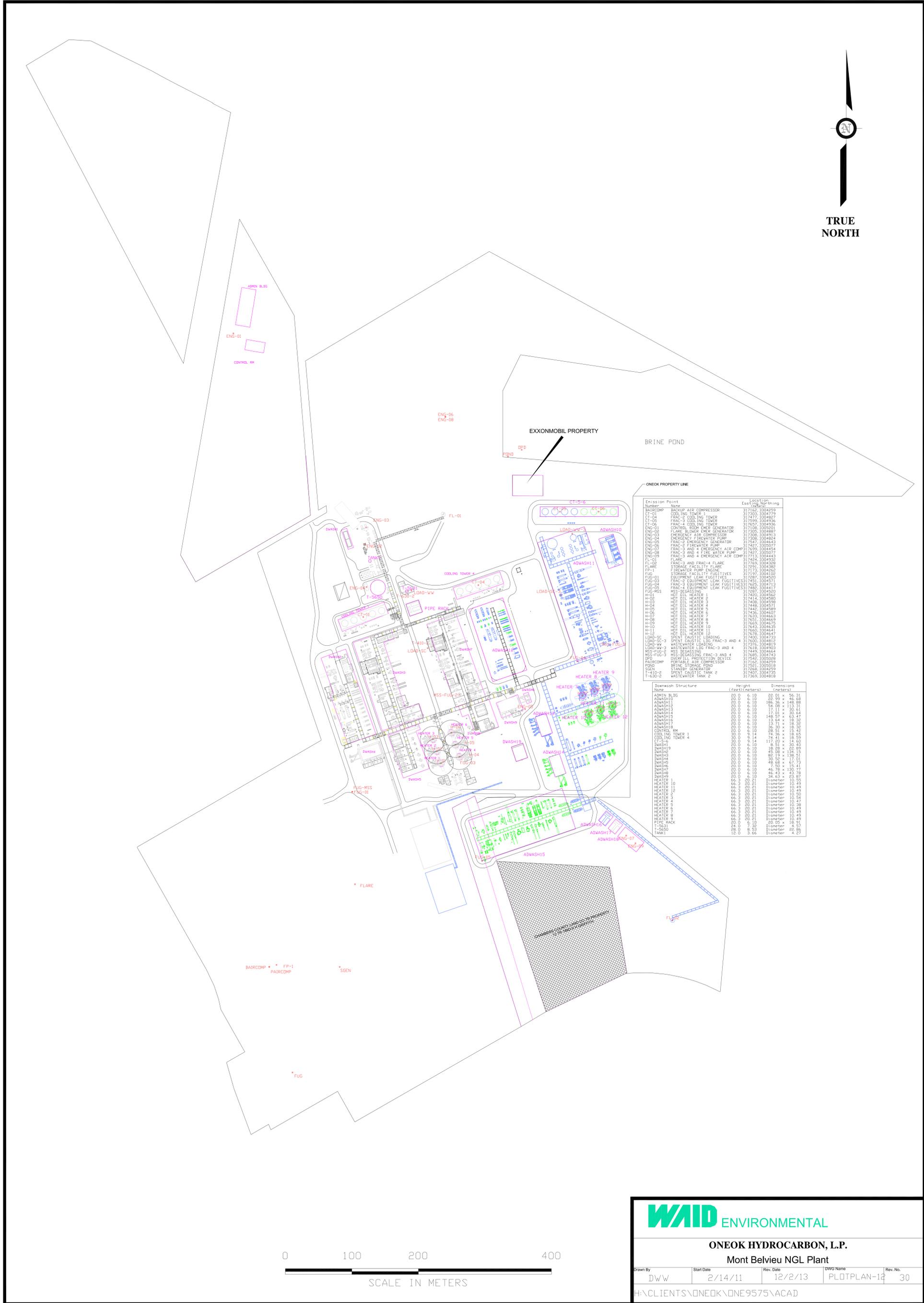
Modeled Emission Rates for Non-Criteria Pollutant Emission Sources

FIN	EPN	MODEL ID	DESCRIPTION	Total VOC		Ammonia		Ammonia		Butanes		H2S		Hexanes+		Hexanes+		Pentanes	
				(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(ton/yr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(lb/hr)	(g/sec)	(ton/yr)	(g/sec)	(lb/hr)	(g/sec)
H-07	H-07	H07	Hot Oil Heater 7	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
H-08	H-08	H08	Hot Oil Heater 8	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
H-09	H-09	H09	Hot Oil Heater 9	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
H-10	H-10	H10	Hot Oil Heater 10	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
H-11	H-11	H11	Hot Oil Heater 11	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
H-12	H-12	H12	Hot Oil Heater 12	0.307	0.039	0.707	0.089	2.83	0.081		0		0		0		0		0
VENTS	H-08	H08	Vents to Hot Oil Heaters		0	0		0		0.006	0.00076	0.044	0.0055	0.096	0.012	0.42	0.012	0.033	0.0042
FL-02	FL-02	FL02	Frac-3 and Frac-4 Flare	0.014	0.0018		0		0	0	0		0		0		0		0
CT-05-1	CT-05-1	CT051	Frac-3 Cooling Tower (Cell 1)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-05-2	CT-05-2	CT052	Frac-3 Cooling Tower (Cell 2)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-05-3	CT-05-3	CT053	Frac-3 Cooling Tower (Cell 3)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-05-4	CT-05-4	CT054	Frac-3 Cooling Tower (Cell 4)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-06-1	CT-06-1	CT061	Frac-4 Cooling Tower (Cell 1)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-06-2	CT-06-2	CT062	Frac-4 Cooling Tower (Cell 2)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-06-3	CT-06-3	CT063	Frac-4 Cooling Tower (Cell 3)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
CT-06-4	CT-06-4	CT064	Frac-4 Cooling Tower (Cell 4)		0	0		0		0.15	0.019		0	0.065	0.0082	0.12	0.0035	0.12	0.015
LOAD-SC-3	LOAD-SC-3	LOADSC3	Spent Caustic Loading (Frac-3 and Frac-4)		0	0		0			0		0	0.0862	0.011	0.001924	0.000055		0
LOAD-WW-3	LOAD-WW-3	LOADWW3	Spent Caustic Loading (Frac-3 and Frac-4)		0	0		0			0		0	0.0862	0.011	0.000672	0.000019		0
ENG-07	ENG-07	ENG07	Frac-3 and Frac-4 Emergency Air Compressor	3.7	0.47		0		0		0		0		0		0		0
ENG-08	ENG-08	ENG08	Frac-3 and Frac-4 Firewater Pump	3.6	0.45		0		0		0		0		0		0		0
ENG-09	ENG-09	ENG09	Frac-3 and Frac-4 Emergency Generator	0.86	0.11		0		0		0		0		0		0		0
FUG-04	FUG-04	FUG04	Frac-3 Fugitives		0		0		0	0.243	0.031	3.32E-06	4.2E-07	0.0642	0.0081	0.281	0.0081	0.132	0.017
FUG-05	FUG-05	FUG05	Frac-4 Fugitives		0		0		0	0.243	0.031	3.32E-06	4.2E-07	0.0642	0.0081	0.281	0.0081	0.132	0.017
MSS-FL-3	FL-02	FL02	MSS-Flaring		0		0		0	153	19		0	42	5.3	1.01	0.029	76.4	9.6
MSS-FUG-3	MSS-FUG-3	MSSFUG3	MSS-Degassing (Frac-3 and Frac-4)		0		0		0	40.65	5.1		0	5.89	0.74	0.024	0.00069	11.05	1.4
MSS-FUG-3	MSS-FUG-3	MSSNH3FU	MSS-Degassing (NH3, Frac-3 and Frac-4)		0	0.472	0.06	0.000904	0.000026		0		0		0		0		0

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APPENDIX B

PLOT PLAN



Emission Point Number	Name	Location Easting	Location Northing
BAIRCMP	BACKUP AIR COMPRESSOR	317165	3304259
CT-01	COOLING TOWER 1	317353	3304779
CT-04	FRAC-2 COOLING TOWER	317477	3304887
CT-05	FRAC-3 COOLING TOWER	317599	3304936
CT-06	FRAC-4 COOLING TOWER	317657	3304936
ENG-01	CONTROL ROOM EMER GENERATOR	317108	3305031
ENG-02	FLARE BLOWER EMER GENERATOR	317305	3304887
ENG-03	EMERGENCY AIR COMPRESSOR	317308	3304887
ENG-04	EMERGENCY FIREWATER PUMP	317305	3304887
ENG-05	FRAC-2 FREQUENCY GENERATOR	317457	3304443
ENG-06	FRAC-3 FREQUENCY GENERATOR	317457	3304443
ENG-07	FRAC-3 AND 4 EMERGENCY AIR COMP	317659	3304454
ENG-08	FRAC-3 AND 4 FIRE WATER PUMP	317457	3304443
ENG-09	FRAC-3 AND 4 EMERGENCY AIR COMP	317113	3304443
FL-01	FLARE	317444	3304932
FL-02	FRAC-3 AND FRAC-4 FLARE	317659	3304328
FLAME	STORAGE FACILITY FLARE	317291	3304262
FP-1	FIREWATER PUMP ENGINE	317153	3304262
FUG	STORAGE FACILITY FUGITIVES	317287	3304262
FUG-01	EQUIPMENT LEAK FUGITIVES	317287	3304262
FUG-02	FRAC-2 EQUIPMENT LEAK FUGITIVES	317453	3304713
FUG-04	FRAC-3 EQUIPMENT LEAK FUGITIVES	317453	3304713
FUG-05	EQUIPMENT LEAK FUGITIVES	317453	3304713
MSS	MSS BEGASSING	317287	3304262
H-01	HOT OIL HEATER 1	317450	3304262
H-02	HOT OIL HEATER 2	317444	3304262
H-03	HOT OIL HEATER 3	317408	3304262
H-04	HOT OIL HEATER 4	317448	3304262
H-05	HOT OIL HEATER 5	317442	3304262
H-06	HOT OIL HEATER 6	317436	3304262
H-07	HOT OIL HEATER 7	317653	3304663
H-08	HOT OIL HEATER 8	317653	3304663
H-09	HOT OIL HEATER 9	317649	3304675
H-10	HOT OIL HEATER 10	317653	3304625
H-11	HOT OIL HEATER 11	317650	3304641
H-12	HOT OIL HEATER 12	317650	3304647
LOAD-SC	SPENT CAUSTIC LOADING	317450	3304225
LOAD-SC-3	SPENT CAUSTIC LDC FRAC-3 AND 4	317650	3304812
LOAD-WW-3	WASTEWATER LDC FRAC-3 AND 4	317618	3304825
LOAD-WW-4	WASTEWATER LDC FRAC-3 AND 4	317449	3304844
MSS-FUG-3	MSS BEGASSING FRAC-3 AND 4	317655	3304743
PAIRCMP	PORTABLE AIR COMPRESSOR	317165	3304259
POND	BRINE STORAGE POND	317511	3305018
SGEN	STANDBY GENERATOR	317268	3304259
T-410-2	SPENT CAUSTIC TANK 2	317457	3304755
T-620-2	WASTEWATER TANK 2	317365	3304818

Downwash Structure Name	Height (feet)	Dimensions (feet)
ADMIN BLDG	20.0	6.10 x 22.01 x 56.31
ADWASH10	20.0	6.10 x 22.01 x 46.68
ADWASH11	20.0	6.10 x 186.38 x 148.89
ADWASH12	20.0	6.10 x 17.11 x 30.61
ADWASH13	20.0	6.10 x 17.11 x 30.61
ADWASH14	20.0	6.10 x 17.11 x 30.61
ADWASH15	20.0	6.10 x 149.57 x 69.47
ADWASH16	20.0	6.10 x 13.44 x 18.38
ADWASH17	20.0	6.10 x 13.44 x 18.38
ADWASH18	20.0	6.10 x 36.30 x 18.38
ADWASH19	20.0	6.10 x 36.30 x 18.38
CONTROL RM	20.0	6.10 x 29.51 x 18.48
CT-05	20.0	9.14 x 74.41 x 18.59
CT-06	20.0	9.14 x 117.02 x 14.65
DWASH1	20.0	6.10 x 18.51 x 30.40
DWASH2	20.0	6.10 x 18.51 x 30.40
DWASH3	20.0	6.10 x 82.19 x 138.57
DWASH4	20.0	6.10 x 82.19 x 138.57
DWASH5	20.0	6.10 x 48.68 x 67.73
DWASH6	20.0	6.10 x 7.54 x 15.41
DWASH7	20.0	6.10 x 46.78 x 130.72
DWASH8	20.0	6.10 x 46.78 x 130.72
DWASH9	20.0	6.10 x 46.78 x 130.72
DWASH10	20.0	6.10 x 46.78 x 130.72
DWASH11	20.0	6.10 x 46.78 x 130.72
DWASH12	20.0	6.10 x 46.78 x 130.72
DWASH13	20.0	6.10 x 46.78 x 130.72
DWASH14	20.0	6.10 x 46.78 x 130.72
DWASH15	20.0	6.10 x 46.78 x 130.72
DWASH16	20.0	6.10 x 46.78 x 130.72
DWASH17	20.0	6.10 x 46.78 x 130.72
DWASH18	20.0	6.10 x 46.78 x 130.72
DWASH19	20.0	6.10 x 46.78 x 130.72
DWASH20	20.0	6.10 x 46.78 x 130.72
DWASH21	20.0	6.10 x 46.78 x 130.72
DWASH22	20.0	6.10 x 46.78 x 130.72
DWASH23	20.0	6.10 x 46.78 x 130.72
DWASH24	20.0	6.10 x 46.78 x 130.72
DWASH25	20.0	6.10 x 46.78 x 130.72
DWASH26	20.0	6.10 x 46.78 x 130.72
DWASH27	20.0	6.10 x 46.78 x 130.72
DWASH28	20.0	6.10 x 46.78 x 130.72
DWASH29	20.0	6.10 x 46.78 x 130.72
DWASH30	20.0	6.10 x 46.78 x 130.72
DWASH31	20.0	6.10 x 46.78 x 130.72
DWASH32	20.0	6.10 x 46.78 x 130.72
DWASH33	20.0	6.10 x 46.78 x 130.72
DWASH34	20.0	6.10 x 46.78 x 130.72
DWASH35	20.0	6.10 x 46.78 x 130.72
DWASH36	20.0	6.10 x 46.78 x 130.72
DWASH37	20.0	6.10 x 46.78 x 130.72
DWASH38	20.0	6.10 x 46.78 x 130.72
DWASH39	20.0	6.10 x 46.78 x 130.72
DWASH40	20.0	6.10 x 46.78 x 130.72
DWASH41	20.0	6.10 x 46.78 x 130.72
DWASH42	20.0	6.10 x 46.78 x 130.72
DWASH43	20.0	6.10 x 46.78 x 130.72
DWASH44	20.0	6.10 x 46.78 x 130.72
DWASH45	20.0	6.10 x 46.78 x 130.72
DWASH46	20.0	6.10 x 46.78 x 130.72
DWASH47	20.0	6.10 x 46.78 x 130.72
DWASH48	20.0	6.10 x 46.78 x 130.72
DWASH49	20.0	6.10 x 46.78 x 130.72
DWASH50	20.0	6.10 x 46.78 x 130.72
DWASH51	20.0	6.10 x 46.78 x 130.72
DWASH52	20.0	6.10 x 46.78 x 130.72
DWASH53	20.0	6.10 x 46.78 x 130.72
DWASH54	20.0	6.10 x 46.78 x 130.72
DWASH55	20.0	6.10 x 46.78 x 130.72
DWASH56	20.0	6.10 x 46.78 x 130.72
DWASH57	20.0	6.10 x 46.78 x 130.72
DWASH58	20.0	6.10 x 46.78 x 130.72
DWASH59	20.0	6.10 x 46.78 x 130.72
DWASH60	20.0	6.10 x 46.78 x 130.72
DWASH61	20.0	6.10 x 46.78 x 130.72
DWASH62	20.0	6.10 x 46.78 x 130.72
DWASH63	20.0	6.10 x 46.78 x 130.72
DWASH64	20.0	6.10 x 46.78 x 130.72
DWASH65	20.0	6.10 x 46.78 x 130.72
DWASH66	20.0	6.10 x 46.78 x 130.72
DWASH67	20.0	6.10 x 46.78 x 130.72
DWASH68	20.0	6.10 x 46.78 x 130.72
DWASH69	20.0	6.10 x 46.78 x 130.72
DWASH70	20.0	6.10 x 46.78 x 130.72
DWASH71	20.0	6.10 x 46.78 x 130.72
DWASH72	20.0	6.10 x 46.78 x 130.72
DWASH73	20.0	6.10 x 46.78 x 130.72
DWASH74	20.0	6.10 x 46.78 x 130.72
DWASH75	20.0	6.10 x 46.78 x 130.72
DWASH76	20.0	6.10 x 46.78 x 130.72
DWASH77	20.0	6.10 x 46.78 x 130.72
DWASH78	20.0	6.10 x 46.78 x 130.72
DWASH79	20.0	6.10 x 46.78 x 130.72
DWASH80	20.0	6.10 x 46.78 x 130.72
DWASH81	20.0	6.10 x 46.78 x 130.72
DWASH82	20.0	6.10 x 46.78 x 130.72
DWASH83	20.0	6.10 x 46.78 x 130.72
DWASH84	20.0	6.10 x 46.78 x 130.72
DWASH85	20.0	6.10 x 46.78 x 130.72
DWASH86	20.0	6.10 x 46.78 x 130.72
DWASH87	20.0	6.10 x 46.78 x 130.72
DWASH88	20.0	6.10 x 46.78 x 130.72
DWASH89	20.0	6.10 x 46.78 x 130.72
DWASH90	20.0	6.10 x 46.78 x 130.72
DWASH91	20.0	6.10 x 46.78 x 130.72
DWASH92	20.0	6.10 x 46.78 x 130.72
DWASH93	20.0	6.10 x 46.78 x 130.72
DWASH94	20.0	6.10 x 46.78 x 130.72
DWASH95	20.0	6.10 x 46.78 x 130.72
DWASH96	20.0	6.10 x 46.78 x 130.72
DWASH97	20.0	6.10 x 46.78 x 130.72
DWASH98	20.0	6.10 x 46.78 x 130.72
DWASH99	20.0	6.10 x 46.78 x 130.72
DWASH100	20.0	6.10 x 46.78 x 130.72

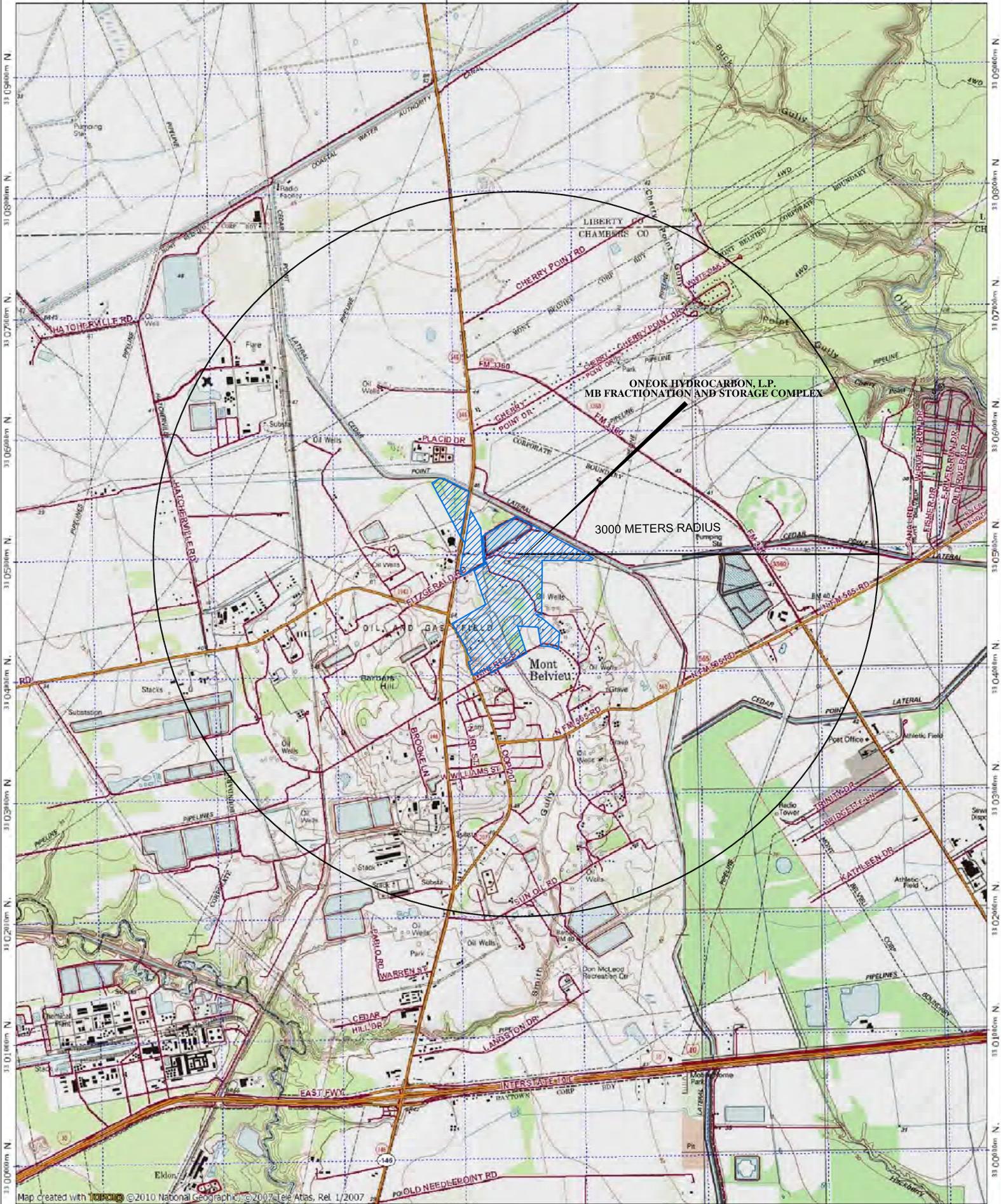


ONEOK HYDROCARBON, L.P.
Mont Belvieu NGL Plant

Drawn By	Start Date	Rev. Date	DWG Name	Rev. No.
DWW	2/14/11	12/2/13	LOTPLAN-12	30

H:\CLIENTS\ONEOK\ONE9575\ACAD

APPENDIX C
AREA MAP



ONEOK HYDROCARBON, L.P.
MB FRACTIONATION AND STORAGE COMPLEX

3000 METERS RADIUS

Mont Belvieu

APPENDIX E - NPDES PERMIT



REGION 6
1445 ROSS AVENUE
DALLAS, TEXAS 75202-2733

NPDES Permit No TX0140091

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

OHLP Mont Belvieu NGL Fractionation Plant
P.O. Box 746
Mont Belvieu TX 77580

is authorized to discharge from a facility located at 11350 Fitzgerald, Baytown, Chambers County, Texas,

from Outfall 001: Latitude 29° 51' 42"N; Longitude 94° 53' 19"W and Outfall 002: Latitude 29° 51' 15"N; Longitude 94° 53' 25"W, both of which discharge into unnamed ditch to Smith Gully to Cedar Bayou tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin.

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Part I, Part II and Part III hereof.

This permit shall become effective on June 1, 2013

This permit and the authorization to discharge shall expire at midnight, May 31, 2018

Issued on April 18, 2013

Prepared by

William K. Honker, P.E.
Director
Water Quality Protection Division (6WQ)

Maria E. Okpala
Environmental Engineer
Permits & Technical Section (6WQ-PP)

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PART I – REQUIREMENTS FOR NPDES PERMITS

SECTION A. LIMITATIONS AND MONITORING REQUIREMENTS

- Internal Outfall 101 – Water Treatment Residuals – 0.158 MGD Average Flow

During the period beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge water treatment residuals from internal Outfall 101, thence to unnamed ditch to Smith Gully of Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	lbs/day, unless noted		mg/l, unless noted		MEASUREMENT FREQUENCY	SAMPLE TYPE
POLLUTANT	MON AVG	DAY MAX	MON AVG	DAY MAX		
Flow	Report MGD	Report MGD	N/A	N/A	Daily	Record
Biochemical Oxygen Demand (BOD ₅)	26.35	39.53	20	30	Twice/month *1	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
	30-Day AVG MINIMUM	7-Day MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
WHOLE EFFLUENT TOXICITY (7day. Static Renewal) (*3)	Report	Report	Once/Quarter	24-Hr Composite
Menidia beryllina	Report	Report	Once/Quarter	24-Hr Composite
Mysidopsis bahia	Report	Report	Once/Quarter	24-Hr Composite

- Outfall 001 – Stormwater, Firewater, Eyewash/showers, water treatment residuals from internal Outfall 101 – 0.158 MGD Average Flow

During the period beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge water treatment residuals from internal Outfall 101, stormwater, firewater, eyewash/showers from Outfall 001, thence to unnamed ditch to Smith Gully of Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Standard Units		MEASUREMENT FREQUENCY	SAMPLE TYPE
POLLUTANT	MINIMUM	MAXIMUM		
pH	6.5	9.0	Twice/month (*1)	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
	lbs/day, unless noted	mg/l, unless noted		MEASUREMENT FREQUENCY	SAMPLE TYPE
POLLUTANT	MON AVG	DAY MAX	DAY MAX		
Flow	Report MGD	Report MGD	N/A	Daily	Record
Total Residual Chlorine	N/A	N/A	33 ug/l(*2)	Twice/month (*1)	Grab

3. Internal Outfall 102 – Cooling Tower Blow-down– 0.448 MGD Average Flow

During the period beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge cooling tower blow-down from internal 102, thence to unnamed ditch to Smith Gully of Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
	lbs/day, unless noted	mg/l, unless noted		MEASUREMENT FREQUENCY	SAMPLE TYPE
POLLUTANT	MON AVG	DAY MAX	DAY MAX		
Flow	Report MGD	Report MGD	N/A	Daily	Record
Biochemical Oxygen Demand (BOD ₅)	74.73	112.09	30	Twice/month (*1)	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING		MONITORING REQUIREMENTS	
	30-Day AVG MINIMUM	7-Day MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
WHOLE EFFLUENT TOXICITY (7day. Static Renewal) (*3)	Report	Report	Once/Quarter	24-Hr Composite
Menidia beryllina	Report	Report	Once/Quarter	24-Hr Composite
Mysidopsis bahia	Report	Report	Once/Quarter	24-Hr Composite

4. Outfall 002-- Cooling Tower Blow-down, Stormwater, Firewater, Eyewash/showers – 0.448 MGD Average Flow

During the period beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge cooling tower blow-down from internal Outfall 102, stormwater, firewater, eyewash/showers from Outfall 002, thence to unnamed ditch to Smith Gully of Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Standard Units		MEASUREMENT FREQUENCY	SAMPLE TYPE
STORET CODE	MINIMUM	MAXIMUM	Twice/month (*1)	Grab
00400	6.5	9.0		

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
	lbs/day, unless noted			MEASUREMENT FREQUENCY	SAMPLE TYPE
STORET CODE	MON AVG	DAY MAX	mg/l, unless noted	Daily	Record
50050	Report MGD	Report MGD	N/A		
Total Residual Chlorine	N/A	N/A	33 ug/l(*2)	Twice/month (*1)	Grab

Footnotes:

- *1 For any monitoring period, samples shall be taken at least seven (7) days from the first sample of the previous monitoring period.
- *2 33 ug/l is defined as the Minimum Quantification level (MQL) for Total Residual Chlorine. See Section B of Part II.
- *3 Monitoring and reporting requirements begin on the effective date of this permit. See Part II, Whole Effluent Toxicity Testing Requirements for additional WET monitoring and reporting conditions.

SAMPLING LOCATION(S) AND OTHER REQUIREMENTS

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit prior to the receiving stream from the following approximate location:

Outfall 001: Latitude 29° 51' 42"N; Longitude 94° 53' 19"W

Outfall 002: Latitude 29° 51' 15"N; Longitude 94° 53' 25"W

Samples taken in compliance with the monitoring requirements specified above for internal Outfalls 101 and 102 shall be taken at the point of discharge from the final treatment unit prior to combining with final Outfall 001 and 002 respectively.

Outfall 101: Latitude 29° 51' 40"N; Longitude 94° 53' 28"W

Outfall 102: Latitude 29° 51' 29.04637"N; Longitude: 94° 53' 26.25273" W

FLOATING SOLIDS, VISIBLE FOAM AND/OR OILS

There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge of visible films of oil, globules of oil, grease or solids in or on the water, or coatings on stream banks.

SECTION B. SCHEDULE OF COMPLIANCE

The permittee shall comply with the following schedule of activities for the attainment of state water quality standards-based final effluent limitation for **total residual chlorine**

- a. Determine exceedance cause(s);
- b. Develop control options, if needed;
- c. Evaluate and select control mechanisms;
- d. Implement corrective action; and
- e. Attain final effluent limitations for **total residual chlorine** no later than 12 months from the permit effective date.

The permittee shall submit quarterly progress reports, to both EPA and Texas Railroad Commission, in accordance with the following schedule. The requirement to submit quarterly progress reports for **total residual chlorine** shall expire 12 months from the permit effective date. No later than 14-days after the date compliance with the **total residual chlorine** final limits have been met, the permittee shall submit a written final report both to EPA and the State Agency, stating that compliance has been completed. If at any time during the compliance periods the permittee determines that full compliance will not be met within the time allowed, a separate report shall be sent to both EPA and the State Agency stating the explanation for this delay and proposed remedial actions.

PROGRESS REPORT DATES

January 30
April 30
July 30
October 30

The permittee should note that each date applies to the prior three month period.

Send progress and final reports to the following addresses:

EPA:
Compliance Assurance and
Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Texas Railroad Commission:
Railroad Commission of Texas
Oil & Gas Division
ATTN: Program Manager
1701 North Congress Avenue
Environmental Services Section
P.O. Box 12967
Austin, TX 78711- 12967

SECTION C. MONITORING AND REPORTING (MINOR DISCHARGERS)

1. Monitoring results must be reported to EPA on either the electronic or paper Discharge Monitoring Report (DMR) approved formats. Monitoring results can be submitted electronically in lieu of the paper DMR Form. To submit electronically, access the NetDMR website at www.epa.gov/netdmr and contact the R6NetDMR@epa.gov in-box for further instructions. Until you are approved for Net DMR, you must report on the Discharge Monitoring Report (DMR) Form EPA No. 3320-1 in accordance with the "General Instructions" provided on the form. No additional copies are needed if reporting electronically, however when submitting paper form EPA No. 3320-1, the permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA and other agencies as required. (See Part III.D.IV of the permit.)

Discharge Monitoring Report Form(s) shall be submitted quarterly. Each quarterly submittal shall include separate forms for each month of the reporting period.

2. Reporting periods shall end on the last day of the months March, June, September, and December.

3. The first Discharge Monitoring Report(s) shall represent facility operations from the effective date of the permit through the last day of the current reporting period.

4. Thereafter, the permittee is required to submit regular quarterly reports as described above and shall submit those reports postmarked no later than the 28th day of the month following each reporting period.

5. NO DISCHARGE REPORTING - If there is no discharge from any outfall during the sampling month, place an "X" in the NO DISCHARGE box located in the upper right corner of the Discharge Monitoring Report.

6. If any daily maximum or monthly average value exceeds the effluent limitations specified in Part I. A, the permittee shall report the excursion in accordance with the requirements of Part III. D.

7. Any daily maximum or monthly average value reported in the required Discharge Monitoring Report which is in excess of the effluent limitation specified in Part I. A shall constitute evidence of violation of such effluent limitation and of this permit.

The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the treated discharge.

All reports shall be sent both to EPA and the Texas Railroad Commission at the addresses shown in Part III of the permit.

C. WATER TREATMENT CHEMICAL PROHIBITION

Products containing chromium and zinc will be prohibited from use as additives to the utility waters.

PART II - OTHER REQUIREMENTS

A. DISCHARGE REPORTING

Should any discharge occur, the permittee is required to sample within one hour of beginning of discharge for the pollutants listed in 40 CFR 122, Appendix D, Tables III and Table IV (See list below), plus flow, pH, hardness, TDS, and TSS and the results submitted to EPA and RRC.

Should the discharge continue for more than one day, additional samples and analyses results shall be submitted for each additional day. No more than four complete sets of analytical results are required to be submitted. After four sets of analytical results have been submitted to EPA, this permit provision is no longer required for the term of this permit.

Other Toxic Pollutants (Metals and Cyanide) and Total Phenols

<u>Pollutant</u>	<u>MQL</u> ug/l	<u>Pollutant</u>	<u>MQL</u> ug/l
Antimony, Total	60	Nickel, Total	0.5
Arsenic, Total	0.5	Selenium, Total	5
Beryllium, Total	0.5	Silver, Total	0.5
Cadmium, Total	1	Thallium, Total	0.5
Chromium, Total	10	Zinc, Total	20
Copper, Total	0.5	Cyanide, Total	10
Lead, Total	0.5	Phenols, Total	10
Mercury, Total	0.0005 0.005		

Conventional and Nonconventional Pollutants Required to Be Tested by Existing Dischargers if Expected to be Present

<u>Pollutant</u>	<u>MQL</u> ug/l	<u>Pollutant</u>	<u>MQL</u> ug/l
Bromide		Sulfite	
Chlorine, Total Residual	33	Surfactants	
Color		Aluminum, Total	2.5
Fecal Coliform		Barium, Total	100
Fluoride		Boron, Total	100
Nitrate-Nitrite		Cobalt, Total	50
Nitrogen, Total Organic		Iron, Total	
Oil & Grease		Magnesium	
Phosphorus		Molybdenum, Total	10
Radioactivity		Manganese, Total	
Sulfate		Tin, Total	
Sulfide		Titanium, Total	

B. MINIMUM QUANTIFICATION LEVEL (MQL)

See list of MQL's at Appendix A of Part II below. For pollutants listed on Appendix A of Part II with MQL's, analyses must be performed to the listed MQL. If any individual analytical test result is less than the MQL listed, a value of zero (0) may be used for that pollutant result for the Discharge Monitoring Report (DMR) calculations and reporting requirements.

In addition, any additional pollutant sampling for purposes of this permit, including renewal applications or any other reporting, shall be tested to the MQL shown on the attached Appendix A of Part II. Results of analyses that are less than the listed MQL may be reported as "non detect" (ND).

C. 24-HOUR ORAL REPORTING: DAILY MAXIMUM LIMITATION VIOLATIONS

Under the provisions of Part III.D.7.b.(3) of this permit, violations of daily maximum limitations for the following pollutants shall be reported orally to EPA Region 6, Compliance and Assurance Division, Water Enforcement Branch (6EN-W), Dallas, Texas, at (214) 665-6595, and concurrently to Railroad Commission of Texas, at (512) 463-6804, within 24 hours from the time the permittee becomes aware of the violation followed by a written report in five days.

Total Residual Chlorine

D. 40 CFR PART 136 ANALYTICAL REQUIREMENTS

Unless otherwise specified in this permit, monitoring shall be conducted according to the analytical, apparatus and materials, sample collection, preservation, handling, etc., procedures listed at 40 CFR Part 136 in effect on the effective date of this permit. Appendices A, B, and C to 40 CFR Part 136 are specifically referenced as part of this requirement. Amendments to 40 CFR Part 136 promulgated after the effective date of this permit shall supersede these requirements as applicable.

E. REOPENER

The permit may be reopened and modified during the life of the permit if relevant portions of the Texas Commission on Environmental Quality (TCEQ) Water Quality Standards for Interstate and Intrastate Streams are revised or remanded. In addition, the permit may be reopened and modified during the life of the permit if relevant procedures implementing the Water Quality Standards are either revised or promulgated by the TCEQ. Should the State adopt a State water quality standard, this permit may be reopened to establish effluent limitations for the parameter(s) to be consistent with that approved State standard in accordance with 40CFR122.44 (d). Modification of the permit is subject to the provisions of 40CFR124.5.

If a new or revised TMDL is determined for the receiving stream, the permit may be reopened, and new limitations based on the TMDL may be incorporated into the permit. Additionally, in

accordance with 40 CFR Part 122.62 (a) (2), the permit may be reopened and modified if new information is received that was not available at the time of permit issuance that would have justified the application of different permit conditions at the time of permit issuance. Permit modifications shall reflect the results of any of these actions and shall follow regulations listed at 40 CFR Part 124.5.

F. STORM WATER POLLUTION PREVENTION

Stormwater has been identified by the applicant/permittee as a component of the discharge through Outfalls 001 and 002. This section applies to all stormwater discharges from the facility through permitted outfalls. The language below has been included in this permit to control stormwater from the facility subject to NPDES regulation:

1. The permittee shall prepare, implement, and maintain a Storm Water Pollution Prevention Plan (SWP3) within six (6) months of the effective date of the final permit. The terms and conditions of the SWP3 shall be an enforceable Part of the permit.
2. A visual inspection of the facility shall be conducted and a report made annually as described in Paragraphs E.2.d and E.2.e below. The annual report shall be retained on site and available upon request.

The following conditions shall be included in the SWP3 for this facility.

- a. The permittee shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the facility; describe and ensure implementation of practices which will be used to reduce pollutants in storm water discharges from the facility; and assure compliance with the terms and conditions of this permit.
- b. The permittee must document where potential spills and leaks could occur that could contribute pollutants to stormwater discharges, and the corresponding outfall(s). The permittee must document all significant spills and leaks of oil or toxic or hazardous pollutants that actually occurred at exposed areas, or that drained to a stormwater conveyance, in the 3 years prior to the date you prepare or amend your SWPPP.

Note: Significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC §9602. This permit does not relieve you of the reporting requirements of 40 CFR 110, 40 CFR 117, and 40 CFR 302 relating to spills or other releases of oils or hazardous substances.

- c. Where experience indicates a reasonable potential for equipment failure (e.g. a tank overflow or leakage), natural conditions e.g. precipitation, or other circumstances which result in significant amounts of pollutants reaching surface waters, the SWP3 should

include a prediction of the direction, rate of flow and total quantity of pollutants which could be discharged from the facility as a result of each condition or circumstance.

d. The permittee shall maintain for a period of three years a record summarizing the results of the inspection and a certification that the facility is in compliance with the SWP3 and the permit, and identifying any incidents of noncompliance. The summary report should contain, at a minimum, the date and time of inspection, name of inspectors(s), conditions found, and changes to be made to the SWP3.

e. The summary report and the following certification shall be signed and attached to the SWP3 and provided to the Environmental Protection Agency and the Railroad Commission of Texas upon request.

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Signatory requirements for the certification may be found in Part III, Section D.11 of this permit.

f. The permittee shall make available to the Agency, the Railroad Commission of Texas, and/or the USFWS, upon request, a copy of the SWP3 and any supporting documentation.

3. The following shall be included in the SWP3, if applicable.

The permittee shall utilize all reasonable methods to minimize any adverse impact on the drainage system including but not limited to:

- i. maintaining adequate road and driveway surfaces;
- ii. removing debris and accumulated solids from the drainage system;
- and
- iii. cleaning up prior to the next storm event, any spill by sweeping, absorbent pads, or other appropriate methods.

b. All spilled product and other spilled wastes shall be immediately cleaned up and disposed of according to all applicable regulations, Spill Prevention and Control (SPC) plans or Spill Prevention Control and Countermeasures (SPCC) plans. Use of detergents, emulsifiers, or dispersants to clean up spilled product is prohibited except where necessary to comply with State or Federal safety regulations (i.e., requirement for non-

slippery work surface). In all such cases, initial cleanup shall be done by physical removal and chemical usage shall be minimized.

- c. All equipment, parts, dumpsters, trash bins, petroleum products, chemical solvents, detergents, or other materials exposed to stormwater shall be maintained in a manner which prevents contamination of stormwater by pollutants.
- d. All waste fuel, lubricants, coolants, solvents, or other fluids used in repair or maintenance of vehicles or equipments shall be recycled or contained for proper disposal. Spills of these materials are to be cleaned up by dry means whenever possible.
- e. Stormwater Pollution Prevention Plan must be consistent with the requirements of the current Oil Pollution Prevention regulations.
- f. Prior to discharge of uncontaminated stormwater from a secondary containment area, the permittee will conduct a visual inspection of the containment area for a visible sheen, an odor associated within the tanked products, and/or a stain pattern within the contained area that is indicative of a spill or leak into that area. No dewatering of the area is allowed under the condition of this permit, if evidence exists of a spill or leak, unless the discharge will not exceed 50 mg/l TOC, 15 mg/l Oil and Grease, or having a pH less than 6.0 or greater than 9.0 standard units.
- g. The permittee shall assure compliance with all applicable regulations promulgated under 40 CFR Part 257. Management practices required under regulations found in this Part shall be referenced in the SWP3.
- h. The permittee shall amend the SWP3 whenever there is a change in the facility or change in the operation of the facility which materially increases the potential for the ancillary activities to result in a discharge of significant amounts of pollutants.
- i. If the SWP3 proves to be ineffective in achieving the general objectives preventing the release of significant amounts of pollutants to water of the state, then the specific objectives and requirements of the SWP3 shall be subject to modification to incorporate revised SWP3 requirements.

G. WHOLE EFFLUENT TOXICITY TESTING (7-DAY CHRONIC NOEC MARINE)

It is unlawful and a violation of this permit for a permittee or his designated agent, to manipulate test samples in any manner, to delay sample shipment, or to terminate or to cause to terminate a toxicity test. Once initiated, all toxicity tests must be completed unless specific authority has been granted by EPA Region 6 or the State NPDES permitting authority.

1. SCOPE AND METHODOLOGY

a. The permittee shall test the effluent for toxicity in accordance with the provisions in this section.

APPLICABLE TO FINAL OUTFALL(S): 101 and 102

REPORTED ON DMR AS FINAL OUTFALL: 101 and 102

CRITICAL DILUTION (%): Outfalls 101 & 102 = 8%

EFFLUENT DILUTION SERIES (%): Outfalls 101 & 102 = 3%, 5%, 6%, 8%, 11%

COMPOSITE SAMPLE TYPE: Defined at PART I

TEST SPECIES/METHODS: 40 CFR Part 136

Mysidopsis bahia (Mysid shrimp) chronic static renewal 7-day survival and growth test using Method 1007.0, EPA-821-R-02-014, or the most recent update thereof.

Menidia beryllina (Inland Silverside minnow) chronic static renewal 7-day larval survival and growth test, Method 1006.0, EPA-821-R-02-014, or the most recent update thereof. A minimum of five (5) replicates with eight (8) organisms per replicate must be used in the control and in each effluent dilution of this test.

b. The NOEC (No Observed Effect Concentration) is herein defined as the greatest effluent dilution at and below which toxicity that is statistically different from the control (0% effluent) at the 95% confidence level does not occur. Chronic lethal test failure is defined as a demonstration of a statistically significant lethal effect at test completion to a test species at or below the critical dilution. Chronic sub-lethal test failure is defined as a demonstration of a statistically significant sub-lethal effect (i.e., growth or reproduction) at test completion to a test species at or below the critical dilution.

c. This permit may be reopened to require whole effluent toxicity limits, chemical specific effluent limits, additional testing, and/or other appropriate actions to address toxicity.

2. PERSISTENT LETHAL and/or SUB-LETHAL EFFECTS

The requirements of this subsection apply only when a toxicity test demonstrates significant lethal and/or sub-lethal effects at or below the critical dilution. The purpose of additional tests (also referred to as 'retests' or confirmation tests) is to determine the duration of a toxic event. A test that meets all test acceptability criteria and demonstrates significant toxic effects does not need additional confirmation. Such testing cannot confirm or disprove a previous test result.

If any valid test demonstrates significant lethal or sublethal effects to a test species at or below the critical dilution, the frequency of testing for that species is automatically increased to once per quarter for the life of the permit.

a. Part I Testing Frequency Other Than Monthly

i. The permittee shall conduct a total of three (3) additional tests for any species that demonstrates significant toxic effects at or below the critical dilution. The additional tests shall be conducted monthly during the next three consecutive months. If testing on a quarterly basis, the permittee may substitute one of the additional tests in lieu of one routine toxicity test. A full report shall be prepared for each test required by this section in accordance with procedures outlined in Item 4 of this section and submitted with the period discharge monitoring report (DMR) to the permitting authority for review.

ii. IF LETHAL EFFECTS HAVE BEEN DEMONSTRATED If any of the additional tests demonstrates significant lethal effects at or below the critical dilution, the permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the TRE initiation date will be the test completion date of the first failed retest. A TRE may also be required due to a demonstration of intermittent lethal effects at or below the critical dilution, or for failure to perform the required retests.

iii. IF ONLY SUB-LETHAL EFFECTS HAVE BEEN DEMONSTRATED If any two of the three additional tests demonstrates significant sub-lethal effects at 75% effluent or lower, the permittee shall initiate the Sub-Lethal Toxicity Reduction Evaluation (TRE_{SL}) requirements as specified in Item 5 of this section. The permittee shall notify EPA in writing within 5 days of the failure of any retest, and the Sub-Lethal Effects TRE initiation date will be the test completion date of the first failed retest. A TRE may also be required for failure to perform the required retests.

iv. The provisions of Item 2.a.i. are suspended upon submittal of the TRE Action Plan.

b. Part I Testing Frequency of Monthly

The permittee shall initiate the Toxicity Reduction Evaluation (TRE) requirements as specified in Item 5 of this section when any two of three consecutive monthly toxicity tests exhibit significant lethal effects at or below the critical dilution. A TRE may also be required due to a demonstration of intermittent lethal and/or sub-lethal effects at or below the critical dilution, or for failure to perform the required retests.

3. REQUIRED TOXICITY TESTING CONDITIONS

a. Test Acceptance

The permittee shall repeat a test, including the control and all effluent dilutions, if the procedures and quality assurance requirements defined in the test methods or in this permit are not satisfied, including the following additional criteria:

- i. The toxicity test control (0% effluent) must have survival equal to or greater than 80%.
- ii. The mean dry weight of surviving Mysid shrimp at the end of the 7 days in the control (0% effluent) must be 0.20 mg per mysid or greater. Should the mean dry weight in the control be less than 0.20 mg per mysid, the toxicity test, including the control and all effluent dilutions shall be repeated.
- iii. The mean dry weight of surviving unpreserved Inland Silverside minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.50 mg per larva or greater. The mean dry weight of surviving preserved Inland Silverside minnow larvae at the end of the 7 days in the control (0% effluent) must be 0.43 mg per larva or greater.
- iv. The percent coefficient of variation between replicates shall be 40% or less in the control (0% effluent) for: the growth and survival endpoints in the Mysid shrimp test; and the growth and survival endpoints of the Inland Silverside minnow test.
- v. The percent coefficient of variation between replicates shall be 40% or less in the critical dilution, unless significant lethal or nonlethal effects are exhibited for: the growth and survival endpoints in the Mysid shrimp test; and the growth and survival endpoints of the Inland Silverside minnow test.
- vi. A Percent Minimum Significant Difference (PMSD) range of 11 - 37 for *Mysidopsis bahia* growth;
- vii. A PMSD range of 11 - 28 for Silverside minnow growth.

Test failure may not be construed or reported as invalid due to a coefficient of variation value of greater than 40%. A repeat test shall be conducted within the required reporting period of any test determined to be invalid.

b. Statistical Interpretation

For the Mysid shrimp and the Inland Silverside minnow larval survival and growth test, the statistical analyses used to determine if there is a significant difference between the control and the critical dilution shall be in accordance with the methods for determining the No Observed Effect Concentration (NOEC) as described in EPA-821-R-02-014 or the most recent update thereof.

If the conditions of Test Acceptability are met in Item 3.a above and the percent survival of the test organism is equal to or greater than 80% in the critical dilution concentration and all lower dilution concentrations, the test shall be considered to be a passing test, and the permittee shall report a survival NOEC of not less than the critical dilution for the DMR reporting requirements found in Item 4 below.

c. Dilution Water

i. Dilution water used in the toxicity tests will be receiving water collected as close to the point of discharge as possible but unaffected by the discharge. The permittee shall substitute synthetic dilution water of similar pH, hardness, and salinity to the closest downstream perennial water for;

(A) toxicity tests conducted on effluent discharges to receiving water classified as intermittent streams; and

(B) toxicity tests conducted on effluent discharges where no receiving water is available due to zero flow conditions.

ii. If the receiving water is unsatisfactory as a result of instream toxicity (fails to fulfill the test acceptance criteria of Item 3.a), the permittee may substitute synthetic dilution water for the receiving water in all subsequent tests provided the unacceptable receiving water test met the following stipulations:

(A) a synthetic dilution water control which fulfills the test acceptance requirements of Item 3.a was run concurrently with the receiving water control;

(B) the test indicating receiving water toxicity has been carried out to completion (i.e., 7 days);

(C) the permittee includes all test results indicating receiving water toxicity with the full report and information required by Item 4 below; and

(D) the synthetic dilution water shall have a pH, hardness, and salinity similar to that of the receiving water or closest downstream perennial water not adversely affected by the discharge, provided the magnitude of these parameters will not cause toxicity in the synthetic dilution water.

d. Samples and Composites

i. The permittee shall collect a minimum of three flow-weighted composite samples from the outfall(s) listed at Item 1.a above.

ii. The permittee shall collect second and third composite samples for use during 24-hour renewals of each dilution concentration for each test. The permittee must collect the composite samples such that the effluent samples are representative of any periodic episode of chlorination, biocide usage or other potentially toxic substance discharged on an intermittent basis.

iii. The permittee must collect the composite samples so that the maximum holding time for any effluent sample shall not exceed 72 hours. The permittee must have initiated the toxicity test within 36 hours after the collection of the last portion of the first composite sample. Samples shall be chilled to 6 degrees Centigrade during collection, shipping, and/or storage.

iv. If the flow from the outfall(s) being tested ceases during the collection of effluent samples, the requirements for the minimum number of effluent samples, the minimum number of effluent portions and the sample holding time are waived during that sampling period. However, the permittee must collect an effluent composite sample volume during the period of discharge that is sufficient to complete the required toxicity tests with daily renewal of effluent. When possible, the effluent samples used for the toxicity tests shall be collected on separate days if the discharge occurs over multiple days. The effluent composite sample collection duration and the static renewal protocol associated with the abbreviated sample collection must be documented in the full report required in Item 4 of this section.

v. MULTIPLE OUTFALLS: If the provisions of this section are applicable to multiple outfalls, the permittee shall combine the composite effluent samples in proportion to the average flow from the outfalls listed in Item 1.a above for the day the sample was collected. The permittee shall perform the toxicity test on the flow-weighted composite of the outfall samples.

4. REPORTING

a. The permittee shall prepare a full report of the results of all tests conducted pursuant to this section in accordance with the Report Preparation Section of EPA-821-R-02-014, or the most current publication, for every valid or invalid toxicity test initiated whether carried to completion or not. The permittee shall retain each full

report pursuant to the provisions of PART III.C.3 of this permit. The permittee shall submit full reports upon the specific request of the Agency. For any test which fails, is considered invalid or which is terminated early for any reason, the full report must be submitted for agency review.

b. A valid test for each species must be reported on the DMR during each reporting period specified in PART I of this permit unless the permittee is performing a TRE which may increase the frequency of testing and reporting. Only ONE set of biomonitoring data for each species is to be recorded on the DMR for each reporting period. The data submitted should reflect the LOWEST lethal and sub-lethal results for each species during the reporting period. All invalid tests, repeat tests (for invalid tests), and retests (for tests previously failed) performed during the reporting period must be attached to the DMR for EPA review.

c. The permittee shall submit the results of each valid toxicity test on the subsequent monthly DMR for that reporting period in accordance with PART III.D.4 of this permit, as follows below. Submit retest information clearly marked as such with the following month's DMR. Only results of valid tests are to be reported on the DMR.

i. Menidia beryllina (Inland Silverside minnow)

A. If the No Observed Effect Concentration (NOEC) for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP6B

B. Report the NOEC value for survival, Parameter No. TOP6B

C. Report the Lowest Observed Effect Concentration (LOEC) value for survival, Parameter No. TXP6B

D. Report the NOEC value for growth, Parameter No. TPP6B

E. Report the LOEC value for growth, Parameter No. TYP6B

F. If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TGP6B

G. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP6B

ii. Mysidopsis bahia (Mysid shrimp)

A. If the NOEC for survival is less than the critical dilution, enter a "1"; otherwise, enter a "0". Parameter No. TLP3E

- B. Report the NOEC value for survival, Parameter No. TOP3E
 - C. Report the LOEC value for survival, Parameter No. TXP3E
 - D. Report the NOEC value for growth, Parameter No. TPP3E
 - E. Report the LOEC value for growth, Parameter No. TYP3E
 - F. If the No Observed Effect Concentration (NOEC) for growth is less than the critical dilution, enter a "1"; otherwise, enter a "0" for Parameter No. TGP3E
 - G. Report the highest (critical dilution or control) Coefficient of Variation, Parameter No. TQP3E
- d. Enter the following codes on the DMR for retests only:
- i. For retest number 1, Parameter 22415, enter a "1" if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a "0."
 - ii. For retest number 2, Parameter 22416, enter a "1" if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a "0."
 - iii. For retest number 3, Parameter 51443, enter a '1' if the NOEC for survival and/or sub-lethal effects is less than the critical dilution; otherwise, enter a '0'

5. TOXICITY REDUCTION EVALUATIONS (TREs)

TREs for lethal and sub-lethal effects are performed in a very similar manner. EPA Region 6 is currently addressing TREs as follows: a sub-lethal TRE (TRE_{SL}) is triggered based on three sub-lethal test failures while a lethal effects TRE (TRE_L) is triggered based on only two test failures for lethality. In addition, EPA Region 6 will consider the magnitude of toxicity and use flexibility when considering a TRE_{SL} where there are no effects at effluent dilutions of less than 76% effluent.

- a. Within ninety (90) days of confirming persistent toxicity, the permittee shall submit a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for conducting a TRE. The TRE Action Plan shall specify the approach and methodology to be used in performing the TRE. A Toxicity Reduction Evaluation is an investigation intended to determine those actions necessary to achieve compliance with water quality-based effluent limits by reducing an effluent's toxicity to an acceptable level. A TRE is defined as a step-wise process which combines toxicity testing and analyses of the physical and chemical characteristics of a toxic effluent to identify the constituents causing effluent toxicity and/or treatment methods which will reduce the effluent toxicity.-The goal of the TRE is to maximally reduce the toxic effects of effluent at the critical dilution and include the following:

- i. Specific Activities. The plan shall detail the specific approach the permittee intends to utilize in conducting the TRE. The approach may include toxicity characterizations, identifications and confirmation activities, source evaluation, treatability studies, or alternative approaches. When the permittee conducts Toxicity Characterization Procedures the permittee shall perform multiple characterizations and follow the procedures specified in the documents "Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures" (EPA-600/6-91/003) and "Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I" (EPA-600/6-91/005F), or alternate procedures. When the permittee conducts Toxicity Identification Evaluations and Confirmations, the permittee shall perform multiple identifications and follow the methods specified in the documents "Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/080) and "Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity" (EPA/600/R-92/081), as appropriate.

The documents referenced above may be obtained through the National Technical Information Service (NTIS) by phone at (703) 487-4650, or by writing:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

- ii. Sampling Plan (e.g., locations, methods, holding times, chain of custody, preservation, etc.). The effluent sample volume collected for all tests shall be adequate to perform the toxicity test, toxicity characterization, identification and confirmation procedures, and conduct chemical specific analyses when a probable toxicant has been identified;

Where the permittee has identified or suspects specific pollutant(s) and/or source(s) of effluent toxicity, the permittee shall conduct, concurrent with toxicity testing, chemical specific analyses for the identified and/or suspected pollutant(s) and/or source(s) of effluent toxicity. Where lethality was demonstrated within 48 hours of test initiation, each composite sample shall be analyzed independently. Otherwise the permittee may substitute a composite sample, comprised of equal portions of the individual composite samples, for the chemical specific analysis;

- iii. Quality Assurance Plan (e.g., QA/QC implementation, corrective actions, etc.); and

- iv. Project Organization (e.g., project staff, project manager, consulting services, etc.).
- b. The permittee shall initiate the TRE Action Plan within thirty (30) days of plan and schedule submittal. The permittee shall assume all risks for failure to achieve the required toxicity reduction.
- c. The permittee shall submit a quarterly TRE Activities Report, with the Discharge Monitoring Report in the months of January, April, July and October, containing information on toxicity reduction evaluation activities including:
 - i. any data and/or substantiating documentation which identifies the pollutant(s) and/or source(s) of effluent toxicity;
 - ii. any studies/evaluations and results on the treatability of the facility's effluent toxicity; and
 - iii. any data which identifies effluent toxicity control mechanisms that will reduce effluent toxicity to the level necessary to meet no significant lethality at the critical dilution.

A copy of the TRE Activities Report shall also be submitted to the state agency.

- d. The permittee shall submit a Final Report on Toxicity Reduction Evaluation Activities no later than twenty-eight (28) months from confirming lethality in the retests, which provides information pertaining to the specific control mechanism selected that will, when implemented, result in reduction of effluent toxicity to no significant lethality at the critical dilution. The report will also provide a specific corrective action schedule for implementing the selected control mechanism.

A copy of the Final Report on Toxicity Reduction Evaluation Activities shall also be submitted to the state agency.

- e. Quarterly testing during the TRE is a minimum monitoring requirement. EPA recommends that permittees required to perform a TRE not rely on quarterly testing alone to ensure success in the TRE, and that additional screening tests be performed to capture toxic samples for identification of toxicants. Failure to identify the specific chemical compound causing toxicity test failure will normally result in a permit limit for whole effluent toxicity limits per federal regulations at 40 CFR 122.44(d)(1)(v).

6. MONITORING FREQUENCY REDUCTION

- a. The permittee may apply for a testing frequency reduction upon the successful completion of the first four consecutive quarters of testing for

one or both test species, with no lethal or sub-lethal effects demonstrated at or below the critical dilution. If granted, the monitoring frequency for that test species may be reduced to not less than once per year for the less sensitive species (usually the Inland Silverside minnow) and not less than twice per year for the more sensitive test species (usually the mysid shrimp).

- b. CERTIFICATION - The permittee must certify in writing that no test failures have occurred and that all tests meet all test acceptability criteria in item 3.a. above. In addition the permittee must provide a list with each test performed including test initiation date, species, NOECs for lethal and sub-lethal effects and the maximum coefficient of variation for the controls. Upon review and acceptance of this information the agency will issue a letter of confirmation of the monitoring frequency reduction. A copy of the letter will be forwarded to the agency's Permit Compliance System section to update the permit reporting requirements.
- c. SUB-LETHAL OR SURVIVAL FAILURES - If any test fails the survival or sub-lethal endpoint at any time during the life of this permit, three monthly retests are required and the monitoring frequency for the affected test species shall be increased to once per quarter until the permit is re-issued. Monthly retesting is not required if the permittee is performing a TRE.

Any monitoring frequency reduction applies only until the expiration date of this permit, at which time the monitoring frequency for both test species reverts to once per quarter until the permit is re-issued.

APPENDIX A of PART II

The following Minimum Quantification Levels (MQL's) are to be used for reporting pollutant data for NPDES permit applications and/or compliance reporting.

POLLUTANTS	MQL µg/l	POLLUTANTS	MQL µg/l
METALS, RADIOACTIVITY, CYANIDE and CHLORINE			
Aluminum	2.5	Molybdenum	10
Antimony	60	Nickel	0.5
Arsenic	0.5	Selenium	5
Barium	100	Silver	0.5
Beryllium	0.5	Thallium	0.5
Boron	100	Uranium	0.1
Cadmium	1	Vanadium	50
Chromium	10	Zinc	20
Cobalt	50	Cyanide	10
Copper	0.5	Cyanide, weak acid dissociable	10
Lead	0.5	Total Residual Chlorine	33
Mercury *1	0.0005 0.005		
DIOXIN			
2,3,7,8-TCDD	0.00001		
VOLATILE COMPOUNDS			
Acrolein	50	1,3-Dichloropropylene	10
Acrylonitrile	20	Ethylbenzene	10
Benzene	10	Methyl Bromide	50
Bromoform	10	Methylene Chloride	20
Carbon Tetrachloride	2	1,1,2,2-Tetrachloroethane	10
Chlorobenzene	10	Tetrachloroethylene	10
Chlorodibromomethane	10	Toluene	10
Chloroform	50	1,2-trans-Dichloroethylene	10
Dichlorobromomethane	10	1,1,2-Trichloroethane	10
1,2-Dichloroethane	10	Trichloroethylene	10
1,1-Dichloroethylene	10	Vinyl Chloride	10
1,2-Dichloropropane	10		
ACID COMPOUNDS			
2-Chlorophenol	10	2,4-Dinitrophenol	50
2,4-Dichlorophenol	10	Pentachlorophenol	5
2,4-Dimethylphenol	10	Phenol	10
4,6-Dinitro-o-Cresol	50	2,4,6-Trichlorophenol	10

POLLUTANTS	MLL µg/l	POLLUTANTS	MLL µg/l
BASE/NEUTRAL			
Acenaphthene	10	Dimethyl Phthalate	10
Anthracene	10	Di-n-Butyl Phthalate	10
Benzidine	50	2,4-Dinitrotoluene	10
Benzo(a)anthracene	5	1,2-Diphenylhydrazine	20
Benzo(a)pyrene	5	Fluoranthene	10
3,4-Benzofluoranthene	10	Fluorene	10
Benzo(k)fluoranthene	5	Hexachlorobenzene	5
Bis(2-chloroethyl)Ether	10	Hexachlorobutadiene	10
Bis(2-chloroisopropyl)Ether	10	Hexachlorocyclopentadiene	10
Bis(2-ethylhexyl)Phthalate	10	Hexachloroethane	20
Butyl Benzyl Phthalate	10	Indeno(1,2,3-cd)Pyrene	5
2-Chloronaphthalene	10	Isophorone	10
Chrysene	5	Nitrobenzene	10
Dibenzo(a,h)anthracene	5	n-Nitrosodimethylamine	50
1,2-Dichlorobenzene	10	n-Nitrosodi-n-Propylamine	20
1,3-Dichlorobenzene	10	n-Nitrosodiphenylamine	20
1,4-Dichlorobenzene	10	Pyrene	10
3,3'-Dichlorobenzidine	5	1,2,4-Trichlorobenzene	10
Diethyl Phthalate	10		
PESTICIDES AND PCBS			
Aldrin	0.01	Beta-Endosulfan	0.02
Alpha-BHC	0.05	Endosulfan sulfate	0.02
Beta-BHC	0.05	Endrin	0.02
Gamma-BHC	0.05	Endrin Aldehyde	0.1
Chlordane	0.2	Heptachlor	0.01
4,4'-DDT and derivatives	0.02	Heptachlor Epoxide	0.01
Dieldrin	0.02	PCBs	0.2
Alpha-Endosulfan	0.01	Toxaphene	0.3

(MLL's Revised November 1, 2007)

Footnotes:

*1 Default MQL for Mercury is 0.005 unless Part I of your permit requires the more sensitive Method 1631 (Oxidation / Purge and Trap / Cold vapor Atomic Fluorescence Spectrometry), then the MQL shall be 0.0005

PART III - STANDARD CONDITIONS FOR NPDES PERMITS

A. GENERAL CONDITIONS

1. INTRODUCTION

In accordance with the provisions of 40 CFR Part 122.41, et. seq., this permit incorporates by reference ALL conditions and requirements applicable to NPDES Permits set forth in the Clean Water Act, as amended, (hereinafter known as the "Act") as well as ALL applicable regulations.

2. DUTY TO COMPLY

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

3. TOXIC POLLUTANTS

- a. Notwithstanding Part III.A.5, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.
- b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

4. DUTY TO REAPPLY

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated at 40 CFR Part 122.6 and any subsequent amendments.

5. PERMIT FLEXIBILITY

This permit may be modified, revoked and reissued, or terminated for cause in accordance with 40 CFR 122.62-64. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

7. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. CRIMINAL AND CIVIL LIABILITY

Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to 18 U.S.C. Section 1001.

9. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

10. STATE LAWS

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

11. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

B. PROPER OPERATION AND MAINTENANCE

1. NEED TO HALT OR REDUCE NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent.

2. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. PROPER OPERATION AND MAINTENANCE

- a. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by permittee as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants and will achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.
- b. The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.

4. BYPASS OF TREATMENT FACILITIES

a. BYPASS NOT EXCEEDING LIMITATIONS

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts III.B.4.b. and 4.c.

b. NOTICE

(1) ANTICIPATED BYPASS

If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

(2) UNANTICIPATED BYPASS

The permittee shall, within 24 hours, submit notice of an unanticipated bypass as required in Part III.D.7.

c. PROHIBITION OF BYPASS

- (1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - (a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

- (b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,
 - (c) The permittee submitted notices as required by Part III.B.4.b.
- (2) The Director may allow an anticipated bypass after considering its adverse effects, if the Director determines that it will meet the three conditions listed at Part III.B.4.c(1).

5. UPSET CONDITIONS

a. EFFECT OF AN UPSET

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Part III.B.5.b. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. CONDITIONS NECESSARY FOR A DEMONSTRATION OF UPSET

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
- (2) The permitted facility was at the time being properly operated;
- (3) The permittee submitted notice of the upset as required by Part III.D.7; and,
- (4) The permittee complied with any remedial measures required by Part III.B.2.

c. BURDEN OF PROOF

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

6. REMOVED SUBSTANCES

Unless otherwise authorized, solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. PERCENT REMOVAL (PUBLICLY OWNED TREATMENT WORKS)

For publicly owned treatment works, the 30-day average (or Monthly Average) percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent unless otherwise authorized by the permitting authority in accordance with 40 CFR 133.103.

C. MONITORING AND RECORDS

1. INSPECTION AND ENTRY

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by the law to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

- d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.
2. REPRESENTATIVE SAMPLING
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. RETENTION OF RECORDS
The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time.
4. RECORD CONTENTS
Records of monitoring information shall include:
- a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) and time(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
5. MONITORING PROCEDURES
- a. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.
 - b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.
 - c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.
6. FLOW MEASUREMENTS
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.
- D. REPORTING REQUIREMENTS
1. PLANNED CHANGES
- a. INDUSTRIAL PERMITS
The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b); or,
 - (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements listed at Part III.D.10.a.
 - b. MUNICIPAL PERMITS

Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. ANTICIPATED NONCOMPLIANCE

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. TRANSFERS

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. DISCHARGE MONITORING REPORTS AND OTHER REPORTS

Monitoring results must be reported on Discharge Monitoring Report (DMR) Form EPA No. 3320-1 in accordance with the "General Instructions" provided on the form. The permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA at the address below. Duplicate copies of DMR's and all other reports shall be submitted to the appropriate State agency(ies) at the following address(es):

EPA:

Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-W)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

Texas:

Program Manager
Environmental Services
Railroad Commission of Texas
1701 North Congress Avenue
P.O. Box 12967
Austin, Texas 7871-2967

5. ADDITIONAL MONITORING BY THE PERMITTEE

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased monitoring frequency shall also be indicated on the DMR.

6. AVERAGING OF MEASUREMENTS

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

7. TWENTY-FOUR HOUR REPORTING

- a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain the following information:

- (1) A description of the noncompliance and its cause;
- (2) The period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and,
- (3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

- b. The following shall be included as information which must be reported within 24 hours:
- (1) Any unanticipated bypass which exceeds any effluent limitation in the permit;
 - (2) Any upset which exceeds any effluent limitation in the permit; and,
 - (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part II (industrial permits only) of the permit to be reported within 24 hours.
- c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.
8. OTHER NONCOMPLIANCE
The permittee shall report all instances of noncompliance not reported under Parts III.D.4 and D.7 and Part I.B (for industrial permits only) at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.7.
9. OTHER INFORMATION
Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.
10. CHANGES IN DISCHARGES OF TOXIC SUBSTANCES
All existing manufacturing, commercial, mining, and silvacultural permittees shall notify the Director as soon as it knows or has reason to believe:
- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitro-phenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or
 - (4) The level established by the Director.
- b. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- (1) Five hundred micrograms per liter (500 µg/L);
 - (2) One milligram per liter (1 mg/L) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or
 - (4) The level established by the Director.
11. SIGNATORY REQUIREMENTS
All applications, reports, or information submitted to the Director shall be signed and certified.
- a. ALL PERMIT APPLICATIONS shall be signed as follows:
- (1) FOR A CORPORATION - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision

making functions for the corporation; or,

- (b) The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

- (2) FOR A PARTNERSHIP OR SOLE PROPRIETORSHIP - by a general partner or the proprietor, respectively.

- (3) FOR A MUNICIPALITY, STATE, FEDERAL, OR OTHER PUBLIC AGENCY - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

- (a) The chief executive officer of the agency, or
- (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

- b. ALL REPORTS required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- (1) The authorization is made in writing by a person described above;
- (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and,

- (3) The written authorization is submitted to the Director.

- c. CERTIFICATION

Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

12. AVAILABILITY OF REPORTS

Except for applications, effluent data, permits, and other data specified in 40 CFR 122.7, any information submitted pursuant to this permit may be claimed as confidential by the submitter. If no claim is made at the time of submission, information may be made available to the public without further notice.

E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

1. CRIMINAL

- a. NEGLIGENT VIOLATIONS

The Act provides that any person who negligently violates permit conditions implementing Section 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

- b. KNOWING VIOLATIONS
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both.
 - c. KNOWING ENDANGERMENT
The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than \$250,000, or by imprisonment for not more than 15 years, or both.
 - d. FALSE STATEMENTS
The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the Clean Water Act)
2. CIVIL PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed \$27,500 per day for each violation.
 3. ADMINISTRATIVE PENALTIES
The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:
 - a. CLASS I PENALTY
Not to exceed \$16,000 per violation nor shall the maximum amount exceed \$37,500.
 - b. CLASS II PENALTY
Not to exceed \$16,000 per day for each day during which the violation continues nor shall the maximum amount exceed \$177,500.
- F. DEFINITIONS
All definitions contained in Section 502 of the Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:
1. ACT means the Clean Water Act (33 U.S.C. 1251 et. seq.), as amended.
 2. ADMINISTRATOR means the Administrator of the U.S. Environmental Protection Agency.
 3. APPLICABLE EFFLUENT STANDARDS AND LIMITATIONS means all state and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards or performance, toxic effluent standards and prohibitions, and pretreatment standards.
 4. APPLICABLE WATER QUALITY STANDARDS means all water quality standards to which a discharge is subject under the Act.
 5. BYPASS means the intentional diversion of waste streams from any portion of a treatment facility.
 6. DAILY DISCHARGE means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the sampling day. "Daily discharge" determination of concentration made using a

composite sample shall be the concentration of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day.

7. DAILY MAXIMUM discharge limitation means the highest allowable "daily discharge" during the calendar month.
8. DIRECTOR means the U.S. Environmental Protection Agency Regional Administrator or an authorized representative.
9. ENVIRONMENTAL PROTECTION AGENCY means the U.S. Environmental Protection Agency.
10. GRAB SAMPLE means an individual sample collected in less than 15 minutes.
11. INDUSTRIAL USER means a nondomestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.
12. MONTHLY AVERAGE (also known as DAILY AVERAGE) discharge limitations means the highest allowable average of "daily discharge(s)" over a calendar month, calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes daily average concentration effluent limitations or conditions, the daily average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily concentration, F = daily flow, and n = number of daily samples; daily average discharge =

$$\frac{C_1F_1 + C_2F_2 + \dots + C_nF_n}{F_1 + F_2 + \dots + F_n}$$
13. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Act.
14. SEVERE PROPERTY DAMAGE means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
15. SEWAGE SLUDGE means the solids, residues, and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff that are discharged to or otherwise enter a publicly owned treatment works.
16. TREATMENT WORKS means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Act, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extension, improvement, remodeling, additions, and alterations thereof.
17. UPSET means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
18. FOR FECAL COLIFORM BACTERIA, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.
19. The term "MGD" shall mean million gallons per day.
20. The term "mg/L" shall mean milligrams per liter or parts per million (ppm).
21. The term "µg/L" shall mean micrograms per liter or parts per billion (ppb).

22. MUNICIPAL TERMS

- a. 7-DAY AVERAGE or WEEKLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The 7-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.
- b. 30-DAY AVERAGE or MONTHLY AVERAGE, other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The 30-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.
- c. 24-HOUR COMPOSITE SAMPLE consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.
- d. 12-HOUR COMPOSITE SAMPLE consists of 12 effluent portions collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.
- e. 6-HOUR COMPOSITE SAMPLE consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.
- f. 3-HOUR COMPOSITE SAMPLE consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.



Material Safety Data Sheet

Issue Date: 27-MAY-2011
Supersedes: 02-MAY-2011

GENGARD GN8020

1 Identification

Identification of substance or preparation

GENGARD GN8020

Product Application Area

Corrosion inhibitor

Company/Undertaking Identification

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone

(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 27-MAY-2011

2 Hazard(s) identification

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard is not applicable

Odor: Slight.Pleasant; Appearance: Amber To Brown, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

US EPA ARCHIVE DOCUMENT

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, headache, dizziness, unconsciousness and injury to the kidneys and liver.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Inhalation may cause irritation of the respiratory tract. Skin contact may cause itching and/or redness.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
*	(E069)CARBOXYLIC ACID POLYMER;TSRN 125438 - 5052P Irritant (eyes)	*

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen and sulfur

FLASH POINT:

> 218F > 103C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use. Atmospheric exposure should be minimized. Avoid high temperature storage. Shelf life 360 days.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

(E069) CARBOXYLIC ACID POLYMER;TSRN 125438 - 5052P

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS. If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:

rubber, butyl, viton or neoprene gloves -- Wash off after

each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav. (70F,21C)	1.166	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	27	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-3		
Viscosity(cps 70F,21C)	36	% Solubility (water)	100.0

Odor	Slight.Pleasant
Appearance	Amber To Brown
Physical State	Liquid
Flash Point	P-M(CC) > 218F > 103C
pH As Is (approx.)	2.6
Evaporation Rate (Water=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with strong bases may cause a violent reaction releasing heat. Contact with water reactive compounds may cause fire or explosion.

INCOMPATIBILITIES:

May react with bases or strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen and sulfur

11 Toxicological information

Oral LD50 RAT:	>5000 mg/kg
NOTE - Calculated value according to GHS additivity formula	
Dermal LD50 RABBIT:	>5000 mg/kg
NOTE - Calculated value according to GHS additivity formula	

12 Ecological information

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
LC50= 3628; No Effect Level= 1250 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 5814; No Effect Level= 5000 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 7071; No Effect Level= 5000 mg/L

BIODEGRADATION

BOD-28 (mg/g): 71
BOD-5 (mg/g): 30
COD (mg/g): 464
TOC (mg/g): 142

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated

IMDG: Not Regulated

15 Regulatory information

TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 144523

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G7 Boiler treatment products - all food processing areas/nonfood contact

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients at trace levels known to the state of California to cause cancer.

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	22-APR-2010		** NEW **
	13-DEC-2010	10,11	22-APR-2010
	01-FEB-2011	8	13-DEC-2010
	08-MAR-2011	12	01-FEB-2011
	25-MAR-2011	5	08-MAR-2011
	06-APR-2011	2,9,10	25-MAR-2011
	02-MAY-2011	15	06-APR-2011
	27-MAY-2011	3,8	02-MAY-2011



Material Safety Data Sheet

Issue Date: 27-MAY-2011
Supercedes: 05-APR-2011

GENGARD GN8225

1 Identification

Identification of substance or preparation

GENGARD GN8225

Product Application Area

Corrosion inhibitor

Company/Undertaking Identification

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone

(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 27-MAY-2011

2 Hazard(s) identification

EMERGENCY OVERVIEW

DANGER

May cause moderate irritation to the skin. Severe irritant to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to steel
Odor: Slight.Pleasant; Appearance: Dark Amber, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Inhalation may cause irritation of the respiratory tract. Skin contact may cause itching and/or redness.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
*	(E069)CARBOXYLIC ACID POLYMER;TSRN 125438 - 5052P Irritant (eyes)	*
7664-38-2	PHOSPHORIC ACID Corrosive	1-5

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Rinse mouth with plenty of water. Dilute contents of stomach using 4-10 fluid ounces (120-300 mL) of milk or water.

NOTES TO PHYSICIANS:

Material is corrosive. It may not be advisable to induce vomiting.
Possible mucosal damage may contraindicate the use of gastric lavage.

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon and phosphorus

FLASH POINT:

> 213F > 101C P-M(CC)

MISCELLANEOUS:

Corrosive to steel
UN 3265;Emergency Response Guide #153

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Acidic. Do not mix with alkaline material.

STORAGE:

Shelf life = 360 days. Store below 100F (38C). Keep containers closed when not in use. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use. Avoid atmospheric exposure. Store only in vented containers.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

(E069)CARBOXYLIC ACID POLYMER;TSRN 125438 - 5052P

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

PHOSPHORIC ACID

PEL (OSHA): 1 MG/M3

TLV (ACGIH): TWA = 1 MG/M3; STEL = 3 MG/M3

MISC: NIOSH REL = 1 MG/M3; NIOSH STEL = 3 MG/M3; NIOSH IDLH = 1000

MG/M3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with HEPA cartridges.

SKIN PROTECTION:

rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav.(70F,21C)	NO DATA	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	23	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-5		
Viscosity(cps 70F,21C)	35	% Solubility (water)	100.0
Odor		Slight.Pleasant	
Appearance		Dark Amber	
Physical State		Liquid	
Flash Point	P-M(CC)	> 213F > 100C	
pH As Is (approx.)		2.6	
Evaporation Rate (Ether=1)		< 1.00	
Percent VOC:		0.0	

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with strong bases may cause a violent reaction releasing heat.

INCOMPATIBILITIES:

May react with bases or strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon and phosphorus

11 Toxicological information

Oral LD50 RAT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY

No Data Available.

BIODEGRADATION

BOD-28 (mg/g): 39

BOD-5 (mg/g): 16

COD (mg/g): 263

TOC (mg/g): 80

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to steel

DOT: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(ACRYLATE TERPOLYMER, PHOSPHORIC ACID)

8, UN 3265, PG III

DOT EMERGENCY RESPONSE GUIDE #: 153

Note: Some containers may be DOT exempt, please check BOL for exact container classification

IATA: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(ACRYLATE TERPOLYMER, PHOSPHORIC ACID)

8, UN 3265, PG III

IMDG: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.(ACRYLATE TERPOLYMER, PHOSPHORIC ACID)

8, UN 3265, PG III

15 Regulatory information

TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: Not Registered

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65):**

This product contains one or more ingredients at trace levels known
to the state of California to cause cancer.

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment
recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	08-FEB-2010		** NEW **
	01-FEB-2011	8	08-FEB-2010
	05-APR-2011	11	01-FEB-2011
	27-MAY-2011	3,8	05-APR-2011

US EPA ARCHIVE DOCUMENT



Material Safety Data Sheet

Issue Date: 03-MAY-2010
Supercedes: 16-JUN-2009

INHIBITOR AZ8104

1 Identification

Identification of substance or preparation
INHIBITOR AZ8104

Product Application Area
Water-based corrosion inhibitor.

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 03-MAY-2010

2 Hazard(s) identification

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. Severe irritant to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard: Corrosive to aluminum
Odor: Slight; Appearance: Yellow To Amber, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

US EPA ARCHIVE DOCUMENT

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Causes irritation of the skin, eyes, and/or respiratory system.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range(w/w%)
202420-04-0	CHLOROTOLYLTRIAZOLE SODIUM SALT Potential irritant	10-20
NOT ASSIGNED	DICHLOROTOLYLTRIAZOLE Potential irritant	3-7
64665-57-2	BENZOTRIAZOLE, METHYL, SODIUM SALT (SODIUM TOLYLTRIAZOLE), (TTA) Corrosive (eyes and skin); toxic (by ingestion)	1-5
1310-73-2	SODIUM HYDROXIDE Corrosive; toxic (by ingestion)	1-5

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician.

Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon and nitrogen, hydrogen chloride

FLASH POINT:

> 200F > 93C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Alkaline. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers. Store away from acids.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

CHLOROTOLYLTRIAZOLE SODIUM SALT

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

DICHLOROTOLYLTRIAZOLE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

BENZOTRIAZOLE, METHYL, SODIUM SALT (SODIUM TOLYLTRIAZOLE), (TTA)

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

SODIUM HYDROXIDE

PEL (OSHA): 2 MG/M3
TLV (ACGIH): TWA (Ceiling) = 2 MG/M3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:

rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav. (70F,21C)	1.132	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	12	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-11		
Viscosity(cps 70F,21C)	13	% Solubility (water)	100.0

Odor	Slight
Appearance	Yellow To Amber
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	12.7
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with strong acids may cause a violent reaction releasing heat.

INCOMPATIBILITIES:

May react with acids or strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon and nitrogen, hydrogen chloride

11 Toxicological information

Oral LD50 RAT: 2,550 mg/kg
NOTE - Value is for tested material 1.6 times more concentrated
28 Day Oral RAT:
NOTE - NOEL: 1,000 mg/kg/day
Dermal LD50 RAT: >8,000 mg/kg
NOTE - Value is for tested material 1.6 times more concentrated
Skin Irritation Score RABBIT: CORROSIVE
NOTE - Value is for tested material 1.6 times more concentrated
Eye Irritation Score RABBIT: CORROSIVE
NOTE - Value is for tested material 1.6 times more concentrated
Skin Sensitization G.PIG: NEGATIVE
NOTE - Magnusson & Kligman method
Ames Assay BACTERIA: NEGATIVE
Non-Ames Mutagenicity : WEAK POSIT.
NOTE - In Vitro chromosome aberration test in human lymphocytes
Non-Ames Mutagenicity : NEGATIVE
NOTE - In Vivo Mouse Micronucleus Test

12 Ecological information

AQUATIC TOXICOLOGY

Annelida(Lumbriculus variegatus) 96 Hour Static Acute Bioassay
LC50= 138; No Effect Level= 62.5 mg/L
Benthic Crustacean(Gammarus pseudolimnaeus) 96 Hour Static Acute
Bioassay
LC50= 42.1; No Effect Level= 25 mg/L
Bluegill Sunfish 96 Hour Static Acute Bioassay
LC50= 36.6; No Effect Level= 25 mg/L
Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50= 124; No Effect Level= 75 mg/L
Ceriodaphnia 7 Day Chronic Bioassay
Reproduction NOEL= 20; Reproduction LOEC= 40 mg/L
Daphnia magna 21 Day Chronic Bioassay (pH adjusted)
Reproduction EC50= 50; Reproduction NOEL= 27 mg/L
Daphnia magna 48 Hour Static Acute Bioassay (pH adjusted)
EC50= 210; EC0= 155 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
LC50= 217; No Effect Level= 148 mg/L
Fathead Minnow 28 Day Chronic Flow-Thru Bioassay (pH adjusted)
Survival NOEL= 4.2; Survival LOEL= 8.3 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay (pH adjusted)
LC50= 135; No Effect Level= 15 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 50.7; No Effect Level= 21.8 mg/L
Freshwater Snail(Physa sp.) 96 Hour Static Acute Bioassay
LC50= 47.4; No Effect Level= 25 mg/L
Menidia beryllina (Silversides) 96 Hour Static Acute Bioassay
LC50= 41; No Effect Level= 25 mg/L
Midge larvae (Chironomus tentans) 96 Hour Static Acute Bioassay
LC50= 95.8; No Effect Level= 62.5 mg/L
Mysid Shrimp 48 Hour Static Acute Bioassay (pH adjusted)
LC50= 53; No Effect Level= 25 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay
LC50= 15.4; No Effect Level= 6.3 mg/L
Sheepshead Minnow 96 Hour Static Acute Bioassay (pH adjusted)
LC50= 132; No Effect Level= 100 mg/L

BIODEGRADATION

BOD-28 (mg/g): 15
BOD-5 (mg/g): 15
COD (mg/g): 300
TOC (mg/g): 100

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to aluminum
DOT: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION)
8, UN 3266, PG III
DOT EMERGENCY RESPONSE GUIDE #: 154
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION)
8, UN 3266, PG III
IMDG: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION)
8, UN 3266, PG III

15 Regulatory information

TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 141530

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G7 Boiler treatment products - all food processing areas/nonfood contact

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65):

No regulated constituents present

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE -----	REVISIONS TO SECTION: -----	SUPERCEDES -----
MSDS status:	10-MAY-1996		** NEW **
	16-AUG-1996	12	10-MAY-1996
	25-NOV-1996	2,8	16-AUG-1996
	03-DEC-1996	2,8	25-NOV-1996
	09-OCT-1997	8	03-DEC-1996
	05-NOV-1997		09-OCT-1997
	01-DEC-1997	15	05-NOV-1997
	02-APR-1998	12	01-DEC-1997
	07-AUG-1998	11	02-APR-1998
	17-AUG-1998	2,8	07-AUG-1998
	02-SEP-1998	12	17-AUG-1998
	05-OCT-1998	15	02-SEP-1998
	20-NOV-1998	2	05-OCT-1998
	03-DEC-1998	3,5,7,8,10,14,16	20-NOV-1998
	01-APR-1999	12	03-DEC-1998
	26-MAY-1999	2,8	01-APR-1999
	23-AUG-1999	12	26-MAY-1999
	25-AUG-1999	12	23-AUG-1999
	28-DEC-1999	15	25-AUG-1999
	18-JAN-2002	4	28-DEC-1999
	12-MAY-2003	2	18-JAN-2002
	06-MAY-2004	12	12-MAY-2003
	26-MAY-2006	8	06-MAY-2004
	12-FEB-2007	2,5,8,10	26-MAY-2006
	16-MAY-2007	8	12-FEB-2007
	03-DEC-2008	14	16-MAY-2007
	01-APR-2009	12	03-DEC-2008
	16-JUN-2009	4,10,15	01-APR-2009
	03-MAY-2010	8	16-JUN-2009

US EPA ARCHIVE DOCUMENT



Material Safety Data Sheet

Issue Date: 12-FEB-2010
Supercedes: 24-JUN-2009

SPECTRUS BD1501E

1 Identification

Identification of substance or preparation
SPECTRUS BD1501E

Product Application Area
Biodispersant

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 12-FEB-2010

2 Hazard(s) identification

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. Severe irritant to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable
Odor: Mild; Appearance: Colorless, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

US EPA ARCHIVE DOCUMENT

INGESTION EFFECTS:

May cause gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin, irritation, and/or tearing of eyes (direct contact).

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
166736-08-9	OXIRANE, METHYL-, POLYMER WITH OXIRANE, MONO(2-PROPYLHEPTYL) ETHER Eye and skin irritant	10-20

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon

FLASH POINT:

> 213F > 101C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

OXIRANE, METHYL-, POLYMER WITH OXIRANE, MONO(2-PROPYLHEPTYL) ETHER
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use organic vapor cartridges and any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:

rubber, butyl or viton gloves -- Wash off after each use.

Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav. (70F, 21C)	1.019	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	31	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-1		
Viscosity (cps 70F, 21C)	110	% Solubility (water)	100.0

Odor	Mild
Appearance	Colorless
Physical State	Liquid
Flash Point	P-M(CC) > 213F > 100C
pH As Is (approx.)	6.7
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

No known hazardous reactions.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon

11 Toxicological information

Oral LD50 RAT:	>200-<2,000 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	
Skin Irritation Score RABBIT:	NONIRRITANT
Eye Irritation Score RABBIT:	IRRITANT

12 Ecological information

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 38.2; No Effect Level= 12.5 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 82.5; No Effect Level= 31.3 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay
LC50= 141.4; No Effect Level= 100 mg/L

BIODEGRADATION

No Data Available.

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated

IMDG: Not Regulated

15 Regulatory information

TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 141060

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G7 Boiler treatment products - all food processing areas/nonfood contact

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	31-JAN-2005		** NEW **
	15-MAR-2007	2,8	31-JAN-2005
	28-SEP-2007	12;EDIT:Rebranding	15-MAR-2007
	08-FEB-2008	12;EDIT:Rebranding	28-SEP-2007
	27-FEB-2008	2,4,8	08-FEB-2008
	15-MAY-2008	8	27-FEB-2008
	24-JUN-2009	10,15	15-MAY-2008
	12-FEB-2010	14	24-JUN-2009

US EPA ARCHIVE DOCUMENT



Material Safety Data Sheet

Issue Date: 21-JUN-2011
Supersedes: 12-AUG-2010

SPECTRUS NX1100

1 Identification

Identification of substance or preparation
SPECTRUS NX1100

Product Application Area
Biocide

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 21-JUN-2011

2 Hazard(s) identification

EMERGENCY OVERVIEW

DANGER

Corrosive to skin. Skin sensitizer with delayed onset of symptoms.
Corrosive to the eyes. Mists/aerosols cause irritation to the upper
respiratory tract.

DOT hazard: Corrosive to skin/steel
Odor: None; Appearance: Colorless To Yellow Green, Liquid

Fire fighters should wear positive pressure self-contained breathing
apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; Corrosive to skin. Skin sensitizer with
delayed onset of symptoms.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

US EPA ARCHIVE DOCUMENT

INGESTION EFFECTS:

May cause severe irritation or burning of the gastrointestinal tract.

TARGET ORGANS:

Prolonged or repeated exposures may cause tissue necrosis and/or skin sensitization.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Direct contact with skin will cause severe delayed skin reactions or burns if not washed off immediately- follow first aid instructions.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range(w/w%)
52-51-7	2-BROMO-2-NITROPROPANE-1,3-DIOL Toxic (by ingestion); irritant (eyes); potential sensitizer (skin)	5-10
10377-60-3	MAGNESIUM NITRATE Oxidizer; irritant (eyes and skin)	1-5
55965-84-9	5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE MIXTURE WITH 2-METHYL-4-ISOTHIAZOLIN-3-ONE Corrosive (eyes and skin); sensitizer	1-5
7786-30-3	MAGNESIUM CHLORIDE Potential irritant	1-5

4 First-aid measures

SKIN CONTACT:

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive

victim. Do not induce vomiting. Immediately contact physician.
Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of
milk or water.

NOTES TO PHYSICIANS:

Material is corrosive. It may not be advisable to induce vomiting.
Possible mucosal damage may contraindicate the use of gastric
lavage.

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing
apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen, and sulfur; hydrogen chloride; and
hydrogen bromide

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to skin/steel
UN 3265;Emergency Response Guide #153

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and
absorb on absorbent material. Place in waste disposal container. Do
not add decontaminant solution to waste drum containing biocide or
adsorbent. Decontaminate floor residual with 10% metabisulfite
solution. Use 10 volumes of solution to one volume of spill.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer
treatment facility, in accordance with any local agreement, a permitted
waste treatment facility or discharged under a permit. Product
as is - Dispose of in approved pesticide facility or according to
label instructions.

7 Handling and storage

HANDLING:

Corrosive to skin. Corrosive to eyes.

STORAGE:

Keep containers closed when not in use. Protect from freezing. If
frozen, thaw and mix completely prior to use. Shelf life 360 days.
Do not store in steel or aluminum containers.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

2-BROMO-2-NITROPROPANE-1,3-DIOL

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

MAGNESIUM NITRATE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE MIXTURE WITH
2-METHYL-4-ISOTHIAZOLIN-3-ONE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

MISC: Manufacturer's recommended exposure limit: TWA = 0.1 mg/m3;

STEL = 0.3 mg/m3 (total isothiazoline)

MAGNESIUM CHLORIDE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use organic vapor cartridges and any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:

gauntlet-type rubber, butyl or neoprene gloves, chemical resistant apron -- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

9 Physical and chemical properties

Spec. Grav. (70F, 21C)	1.107	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	24	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-4		
Viscosity (cps 70F, 21C)	10	% Solubility (water)	100.0

Odor	None
Appearance	Colorless To Yellow Green
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	3.0
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with strong bases may cause a violent reaction releasing heat. Contact with water reactive compounds may cause fire or explosion.

INCOMPATIBILITIES:

May react with strong reducing agents.

DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen, and sulfur; hydrogen chloride; and hydrogen bromide

11 Toxicological information

Oral LD50 RAT:	1030 mg/kg
Dermal LD50 RABBIT:	>5000 mg/kg
NOTE - Calculated value according to GHS additivity formula	
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	CORROSIVE
Skin Sensitization G.PIG:	NEGATIVE

12 Ecological information

AQUATIC TOXICOLOGY

Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50= 4.7; No Effect Level= .63 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 5; No Effect Level= 2.5 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 3.5; No Effect Level= 1.8 mg/L
Mysid Shrimp 48 Hour Static Renewal Bioassay
LC50= 40.5; No Effect Level= 18 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay
LC50= 7.2; No Effect Level= 3.1 mg/L
Sheepshead Minnow 96 Hour Static Renewal Bioassay
LC50= 26.7; No Effect Level= 15.5 mg/L

BIODEGRADATION

BOD-28 (mg/g): 4
BOD-5 (mg/g): 2
COD (mg/g): 78
TOC (mg/g): 29

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to skin/steel
DOT: CORROSIVE LIQUID, ACIDIC, ORGANIC,
N.O.S.(5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE)
8, UN 3265, PG II
DOT EMERGENCY RESPONSE GUIDE #: 153
Note: Some containers may be DOT exempt, please check BOL for
exact container classification
IATA: CORROSIVE LIQUID, ACIDIC, ORGANIC,
N.O.S.(5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE)
8, UN 3265, PG II
IMDG: CORROSIVE LIQUID, ACIDIC, ORGANIC,
N.O.S.(5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE)
8, UN 3265, PG II

15 Regulatory information

TSCA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FIFRA REGISTRATION NUMBER:

3876- 151

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.300 & 176.170 (slimicides and as a preservative)
When used in this specified application, all ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a)(4).

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: 141064

Category Code(s):

- G5 Cooling and retort water treatment products - all food processing areas
- G7 Boiler treatment products - all food processing areas/nonfood contact

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
10377-60-3	MAGNESIUM NITRATE	2.0-5.0%

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65):

No regulated constituents present

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII

CODE TRANSLATION

Health	3	Serious Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles,Face Shield,Gloves,Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	24-SEP-1997		** NEW **
	26-FEB-1998	12	24-SEP-1997
	20-MAY-1998	15	26-FEB-1998
	22-MAY-1998	2	20-MAY-1998
	07-JUL-1998	12	22-MAY-1998
	15-DEC-1998	7	07-JUL-1998
	01-APR-1999	12	15-DEC-1998
	05-NOV-1999	12	01-APR-1999
	11-MAY-2001	4	05-NOV-1999
	17-JAN-2002	10	11-MAY-2001
	12-OCT-2004	15	17-JAN-2002
	17-NOV-2004	15	12-OCT-2004
	14-JUN-2005	3,9	17-NOV-2004
	04-JAN-2007	2,5,7,10	14-JUN-2005
	25-JAN-2007	5,9,13	04-JAN-2007
	22-MAR-2007	5,9,13	25-JAN-2007
	29-JUN-2007	6,8,16	22-MAR-2007
	02-JUL-2008	4,8	29-JUN-2007
	15-MAY-2009	15	02-JUL-2008
	17-JUN-2009	15	15-MAY-2009
	05-FEB-2010	6	17-JUN-2009
	12-AUG-2010	3,7,8	05-FEB-2010
	21-JUN-2011	10,12	12-AUG-2010

US EPA ARCHIVE DOCUMENT



Material Safety Data Sheet

Issue Date: 06-OCT-2011
Supersedes: 29-NOV-2010

POLYFLOC AE1115

1 Identification

Identification of substance or preparation
POLYFLOC AE1115

Product Application Area
Flocculant.

Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone
(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 06-OCT-2011

2 Hazard(s) identification

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. Severe irritant to the eyes. Vapors, gases, mists or aerosols may cause irritation to the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

DOT hazard is not applicable
Odor: Mild; Appearance: White, Emulsion

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical/CO2/foam or water--slippery condition; use sand/grit.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

US EPA ARCHIVE DOCUMENT

Primary route of exposure: Vapors, gases, mists or aerosols may cause irritation to the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

INGESTION EFFECTS:

May cause severe gastrointestinal irritation with possible nausea, vomiting, diarrhea, salivation, blurred vision, weakness, paralysis and injury to kidneys, heart and respiratory system. Aspiration may cause lung injury or death.

TARGET ORGANS:

Prolonged or repeated exposures may cause CNS depression.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Excessive skin contact may cause defatting or drying of skin.
Excessive inhalation of vapors may cause dizziness, headache and nausea.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range (w/w%)
64742-47-8	ISOPARAFFINIC PETROLEUM DISTILLATE Combustible liquid; irritant; CNS depressant; IARC=3 (carcinogen status not classifiable)	15-40
68002-97-1	ALCOHOLS, C10-C16, ETHOXYLATED Slight Irritant (eyes and skin)	1-5
68551-12-2	ALCOHOLS, C12-16, ETHOXYLATED Severe irritant (eyes); moderate irritant (skin)	1-5
68439-50-9	ALCOHOLS, C12-14, ETHOXYLATED Irritant (eyes and skin)	1-5

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If

breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:

This product contains a hydrocarbon solvent. Aspiration into the lungs will result in chemical pneumonia and may be fatal.

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical/CO2/foam or water--slippery condition; use sand/grit.

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen and sulfur

FLASH POINT:

> 200F > 93C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Normal chemical handling.

STORAGE:

Shelf life = 240 days. Keep containers closed when not in use. Reasonable and safe chemical storage. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

ISOPARAFFINIC PETROLEUM DISTILLATE

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.
TLV (ACGIH): TWA (Skin): 200 MG/M3; A3 (for Kerosene)

ALCOHOLS, C10-C16, ETHOXYLATED

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

ALCOHOLS, C12-16, ETHOXYLATED

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

ALCOHOLS, C12-14, ETHOXYLATED

PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.

TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor cartridges.

SKIN PROTECTION:

viton gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav. (70F, 21C)	1.019	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	~ 23	Vapor Density (air=1)	> 1.00
Freeze Point (C)	~ -5		
Viscosity (cps 70F, 21C)	1000	% Solubility (water)	ND

Odor	Mild
Appearance	White
Physical State	Emulsion
Flash Point	P-M(CC) > 200F > 93C
pH 1% Sol. (approx.)	7.0
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	22.4

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with oxidizers may cause fire. Contact with water reactive compounds may cause fire or explosion.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon, nitrogen and sulfur

11 Toxicological information

Oral LD50 RAT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY

Bluegill Sunfish 96 Hour Static Acute Bioassay
LC50= 89; No Effect Level= 18 mg/L
Ceriodaphnia 48 Hour Static Acute Bioassay
LC50= 2.8; No Effect Level= 2.06 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 3.9; 5% Mortality= 1.6 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 25; 25% Mortality= 15 mg/L
Rainbow Trout 96 Hour Static Acute Bioassay
LC50= 75; No Effect Level= 10 mg/L

BIODEGRADATION

COD (mg/g): 1270
TOC (mg/g): 510

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated

IMDG: Not Regulated

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

Treat as oil spill

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.110 (acrylamide - acrylic acid resins)
All ingredients comprising this product are authorized by FDA
for the manufacture of paper and paperboard that may contact
aqueous and fatty foods as per 21 CFR 176.170(a) (4).

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: Not Registered
This product contains ingredients that have been determined as
safe for use in sewage and/or drain lines. (L1)

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65):

This product contains one or more ingredients known to the state of
California to cause cancer and reproductive toxicity.

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII		CODE TRANSLATION
Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment
recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	23-JUN-2000	12	** NEW **
	01-JUN-2001	15	23-JUN-2000
	11-DEC-2001	2,3,4,5,7,8,15,16	01-JUN-2001
	01-APR-2004	15	11-DEC-2001
	19-NOV-2009	4,5,7,8,10,12,14	01-APR-2004
	29-NOV-2010	7,10	19-NOV-2009
	06-OCT-2011	11	29-NOV-2010



Material Safety Data Sheet

Issue Date: 16-SEP-2011
Supersedes: 07-APR-2011

KLARAIID PC1192

1 Identification

Identification of substance or preparation

KLARAIID PC1192

Product Application Area

Coagulant.

Company/Undertaking Identification

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone

(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 16-SEP-2011

2 Hazard(s) identification

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard: IMDG Marine Pollutant
Odor: Mild; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical/CO2/foam or water--slippery condition; use sand/grit.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

US EPA ARCHIVE DOCUMENT

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

Cas#	Chemical Name	Range(w/w%)
26062-79-3	2-PROPEN-1-AMINIUM, N,N-DIMETHYL-N-2-PROPENYL-, CHLORIDE, HOMOPOLYMER Slight irritant (eyes, skin, and respiratory)	15-40

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical/CO2/foam or water--slippery condition; use sand/grit.

HAZARDOUS DECOMPOSITION PRODUCTS:

oxides of carbon and nitrogen, hydrogen chloride

FLASH POINT:

> 200F > 93C SETA(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use.

8 Exposure controls / personal protection

EXPOSURE LIMITS

CHEMICAL NAME

2-PROPEN-1-AMINIUM, N,N-DIMETHYL-N-2-PROPENYL-, CHLORIDE, HOMOPOLYMER
PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.
TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:

rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav. (70F, 21C)	1.032	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-1		
Viscosity (cps 70F, 21C)	168	% Solubility (water)	100.0

Odor	Mild
Appearance	Yellow
Physical State	Liquid
Flash Point	SETA(CC) > 200F > 93C
pH As Is (approx.)	6.3
Evaporation Rate (Ether=1)	< 1.00
Percent VOC:	0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:

Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:

Contact with water reactive compounds may cause fire or explosion.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

oxides of carbon and nitrogen, hydrogen chloride

11 Toxicological information

Oral LD50 RAT: >5000 mg/kg

NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY

Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50= .34; No Effect Level= .25 mg/L

Ceriodaphnia 7 Day Chronic Bioassay
Reproduction NOEL= 1; Reproduction LOEC= 2 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 17.5; 20% Mortality= 1.6 mg/L

Fathead Minnow 7 Day Chronic Bioassay
Growth NOEL= 1; Growth LOEL= 2 mg/L

Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 1.65; No Effect Level= .15 mg/L

Mysid Shrimp 48 Hour Static Renewal Bioassay
LC50= 628.5; No Effect Level= 125 mg/L

Rainbow Trout 96 Hour Static Acute Bioassay
LC50= .49; No Effect Level= .37 mg/L

Sheepshead Minnow 96 Hour Static Renewal Bioassay
No Effect Level= 2000 mg/L
No Data Available.

BIODEGRADATION

BOD-28 (mg/g): 7
BOD-5 (mg/g): 0
COD (mg/g): 270
TOC (mg/g): 90

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: IMDG Marine Pollutant
DOT: Not Regulated

DOT EMERGENCY RESPONSE GUIDE #: Not applicable

Note: Some containers may be DOT exempt, please check BOL for exact container classification

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID,
N.O.S.2-PROPEN-1-AMINIUM, N,N-DIMETHYL-N-2-PROPENYL-, CHLORIDE,
HOMOPOLYMER

9, UN3082 PG III, MARINE POLLUTANT

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE LIQUID,
N.O.S.2-PROPEN-1-AMINIUM, N,N-DIMETHYL-N-2-PROPENYL-, CHLORIDE,
HOMOPOLYMER

9, UN3082 PG III, MARINE POLLUTANT

15 Regulatory information

TSCA:

All components of this product are included on or are in compliance with the U.S. TSCA regulations.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

NSF Registered and/or meets USDA (according to 1998 Guidelines):

Registration number: Not Registered

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65):**

No regulated constituents present

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 Other information

HMIS VII

CODE TRANSLATION

Health	1	Slight Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	28-JAN-1997		** NEW **
	13-NOV-1998	15	28-JAN-1997
	16-NOV-1998	15	13-NOV-1998
	21-JUL-1999	4	16-NOV-1998
	03-MAY-2000	12	21-JUL-1999
	16-OCT-2000	4,11,16	03-MAY-2000
	07-JUN-2005	12	16-OCT-2000
	13-MAY-2008	4,5,8,10	07-JUN-2005
	18-OCT-2010	3,10	13-MAY-2008
	21-OCT-2010	14	18-OCT-2010
	07-APR-2011	7	21-OCT-2010
	16-SEP-2011	11	07-APR-2011



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US EPA ARCHIVE DOCUMENT

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