# Biological Assessment

# for the Expansion Project at the

# Mont Belvieu Natural Gas Liquids Fractionation Facility

**ONEOK Hydrocarbon, L.P.**

**Project No. 67371**

April 2013

# Biological Assessment for the Expansion Project at the Mont Belvieu Natural Gas Liquids Fractionation Facility

**prepared for**

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

**April 2013**

**Project No. 67371**

**prepared by**

**Burns & McDonnell Engineering Company, Inc.**
**Kansas City, Missouri**

# TABLE OF CONTENTS

**Page No.**

## LIST OF TABLES

**Page No.**

# EXECUTIVE SUMMARY

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 "MB3 Facility") will consist of an additional fractionation train. The proposed MB3 Facility will require a Prevention of Significant Deterioration ("PSD") permit from the U.S. Environmental Protection Agency ("EPA") for greenhouse gas emissions. Because this is a federal action, it triggers 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 federally listed as endangered Whooping Crane, which 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 MB3 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 ("$NO_2$"), sulfur dioxide ("$SO_2$"), or particulate matter ("$PM_{10}$") and fine particulate matter ("$PM_{2.5}$"). The air dispersion modeling analysis predicted Facility impacts would only be higher than the 1-hour $NO_2$, 24-hour $PM_{10}$ and 24-hour $PM_{2.5}$ SILs and that the boundary of the Action Area extends 0.71 km (0.44 miles) out from the sources of air emissions from the Facility. Emissions of non-criteria pollutants from the proposed MB3 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 MB3 Facility.

On April 5 and 6, 2012, two biologists from Burns & McDonnell surveyed 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 MB3 Facility. The results of the field survey indicate that the proposed MB3 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 MB3 Facility will be located, the lack of potential protected species habitat at the proposed MB3 Facility site and within the Action Area, and the level of emissions that would result from operation of the proposed MB3 Facility, it was determined that the proposed MB3 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 | *Chelonia mydas* | Threatened | No | No Effect |
| Hawksbill Sea Turtle | *Eretmochelys imbricata* | Endangered | No | No Effect |
| Kemp's Ridley Sea Turtle | *Lepidochelys kempii* | Endangered | No | No Effect |
| Leatherback Sea Turtle | *Dermochelys coriacea* | Endangered | No | No Effect |
| Loggerhead Sea Turtle | *Caretta caretta* | Threatened | No | No Effect |
| Louisiana Black Bear | *Ursus americanus luteolus* | Threatened | No | No Effect |
| Piping Plover | *Charadrius melodus* | Threatened | No | No Effect |
| Red Wolf | *Canis rufus* | Endangered | No | No Effect |
| Smalltooth Sawfish | *Pristis pectinata* | Endangered | No | No Effect |
| Whooping Crane | *Grus americana* | Endangered | No | No Effect |

# 1.0 INTRODUCTION

ONEOK Hydrocarbon, L.P. ("OHLP") is proposing 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 "MB3 Facility") would consist of a new fractionation train, and would be located adjacent to existing natural gas liquids storage caverns and on the same site as the previously-permitted fractionation plant (MB2 Facility) for which ongoing construction commenced during the second quarter of 2011. The proposed MB3 Facility will require a Prevention of Significant Deterioration ("PSD") permit from the U.S. Environmental Protection Agency ("EPA") for greenhouse gas emissions. Because this is a federal action, it triggers 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 triggers Section 7 of the federal Endangered Species Act. Under the Endangered Species Act, EPA may need to consult with the FWS and NMFS to determine if the proposed MB3 Facility authorized by an EPA-issued PSD permit could 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.

## 1.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed project would consist of constructing and operating the MB3 Facility, which includes a fractionation train for natural gas liquids. The 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 MB3 Facility would be constructed and operated by OHLP. The MB3 Facility footprint is approximately eight 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 adjacent to existing natural gas liquids storage caverns and on the same site as the previously-permitted MB2 Facility fractionation plant for which ongoing construction commenced during the second quarter of 2011 (Figure 3, Appendix A). Construction of the proposed MB3 Facility is anticipated to begin in the second quarter of 2013 with operations planned to begin in the third quarter of 2014.

Construction Equipment would access the site from North Main Street, State Highway 146, and Fitzgerald Road. During operation, vehicles would access the proposed MB3 Facility from an entrance road constructed off of Fitzgerald Road.

### 1.2.1 Noise

Construction-related noise would be localized and short-term, and 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. Construction activities and the noise it generates would typically occur during the daytime (between 7:00 a.m. to 7:00 p.m.). Overall, these sound levels would be 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 MB3 Facility would 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 MB3 Facility will produce both process and non-process wastewater. Process water that directly contacts NGL, finished product, amine, and other process chemicals will be contained and disposed off-site. Only non-process wastewater will be discharged through an EPA and Railroad Commission of Texas administrated National Pollutant Discharge Elimination System ("NPDES") Permit No. TX0140091 (Appendix D). The primary sources of non-process wastewater will be water treatment residuals, cooling tower blow-down, firewater, and storm water. The quantity and quality of non-process wastewater that will directly enter the environment are described in the following paragraphs.

Approximately 2,200 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). To pre-treat the raw water for cooling tower make-up 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 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 110 gallons per minute ("gpm") and 311 gpm respectively.

NPDES Outfall 001 and 002 will intermittently receive precipitation, firewater, and eye wash/shower (safety equipment) discharges. The 25-year wet-weather flow rates of Outfalls 001 and 002 are approximately 21,600 gpm and 30,000 gpm respectively. Outfall 001 will discharge to a southern unnamed ditch tributary that is approximately 0.2 miles long and joins Smith Gully south of Winfree Street. Outfall 002 will discharge to a northern unnamed ditch tributary to Smith Gully. Effluent from

Outfall 002 will flow approximately 2.9 miles along the unnamed ditch tributary before flowing into Smith Gully south of the Facility. Effluent from both 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 Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). The point at which Smith Gulley empties into Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) 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 Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). Outfall effluent quality will be regulated by NPDES Permit No. TX0140091 and routinely monitored. 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. An estimate of effluent quality was provided in the NPDES Permit No. TX0140091 Statement of Basis and is included in Appendix D 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** | 311 | GenGard GN8225 | Cooling Tower | 0.0005 | 0.0002% |
| | | GenGard GN8020 | Cooling Tower | 0.0194 | 0.006% |
| | | Inhibitor AZ8104 | Cooling Tower | 0.0032 | 0.001% |
| | | Spectrus BD1501E | Cooling Tower | 0.0034 | 0.001% |
| | | Spectrus NX1100 | Cooling Tower | (1) | (1) |
| | | 98% Sulfuric Acid | Cooling Tower | 0.0527 | 0.017% |
| | | 12.5% NaClO | Cooling Tower | 0.0395 | 0.013% |
| | | 38% NaHSO3 | Cooling Tower | 0.00052 | 0.0002% |
| **001** | 110 | 12.5% NaClO | Water Treatment | 0.0258 | 0.023% |
| | | 38% NaHSO3 | Water Treatment | 0.00018 | 0.0002% |
| | | PolyFloc AE1115 | Water Treatment | 0.0185 | 0.017% |
| | | KlarAid PC1192 | Water Treatment | 0.0155 | 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 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 of the Facility. Best Management Practices will be implemented in accordance with Section 401 of the Clean Water Act, Chapter 279 of the Texas Water Code, and as described in Storm Water Pollution Prevention Plan for the Facility.

Wastewater quality and quantity from the OHLP fractionation facility 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 Best Management Practices. 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 are provided in the NPDES Permit No. TX0140091 Statement of Basis (Appendix D). The EPA has concluded in the NPDES Permit No. TX0140091 Statement of Basis that the wastewater quality and quantity 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

[1] 50 CFR §402.02.

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 MB3 Facility, which includes the proposed MB3 Facility's laydown areas and tie-ins to existing linear support facilities (electrical distribution, water, etc.), may result from operation of the proposed MB3 Facility.

Based on air emission dispersion modeling (Appendix C), it was determined that emissions from operation of the proposed MB3 Facility would be above a federally-established threshold screening level that is used to establish the geographical area in which the potential for impacts is evaluated. Emissions from the operation of the proposed MB3 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 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 was conducted. If the predicted concentration of a pollutant is greater than its corresponding SIL, then a radius of potential impact was defined, a representative ambient monitoring background concentration was added, and the resulting total design concentration was compared to its NAAQS standard. The Action Area for this Biological Assessment was defined based upon the greatest radius at which predicted levels of CO, $NO_2$, $SO_2$, or $PM_{10}$ and $PM_{2.5}$ were higher than the SIL applicable for each constituent's corresponding NAAQS standard and averaging period.

Air dispersion modeling predicted MB3 Facility emissions would be higher than the 1-hour $NO_2$, 24-hour $PM_{10}$ and 24-hour $PM_{2.5}$ SILs, and lower than the CO, annual $NO_2$, annual $PM_{2.5}$, 1-hour $SO_2$, and 3-hour $SO_2$ SILs (Table 1-2). Additionally, the air dispersion modeling analysis predicted the following radii for potential impacts resulting from air emissions from the MB3 Facility.

- Predicted emissions were above the 1-hour $NO_2$ SIL as far out as 0.71 kilometers (km) or 0.44 miles from the sources of air emissions from the MB3 Facility
- Predicted emissions were above the 24-hour $PM_{10}$ SIL as far out as 0.39 kilometers (km) or 0.24 miles from the sources of air emissions from the MB3 Facility

- Predicted emissions were above the 24-hour $PM_{2.5}$ SIL as far out as 0.60 km or 0.37 miles from the sources of air emissions from the MB3 Facility

The boundary of the Action Area was determined to be the greater of the two distances at which predicted emissions were above a SIL. Accordingly, the Action Area extends 0.71 km (0.44 miles) out from the sources of air emissions from the MB3 Facility (Figures 2 and 3, Appendix A). The potential for impacts to protected resources from the proposed MB3 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 C)**

| Pollutant | Averaging Time | SIL* (µg/m$^3$) | Max Modeled Concentration (µg/m$^3$) | Potential Impact | Radius of Potential Impact (km) | Ambient Monitoring Background Concentration (µg/m$^3$) | Total Design Concentration (µg/m$^3$)** | NAAQS (µg/m$^3$) |
|---|---|---|---|---|---|---|---|---|
| CO | 1-hour | 2,000 | 158 | No | N/A | N/A | N/A | 40,000 |
| CO | 8-hour | 500 | 91 | No | N/A | N/A | N/A | 10,000 |
| $NO_2$ | 1-hour | 7.5 | 8.2 | Yes | 0.71 | 97 | 105 | 188 |
| $NO_2$ | Annual | 1 | 0.2 | No | N/A | N/A | N/A | 100 |
| $PM_{10}$ | 24-hour | 5 | 5.8 | Yes | 0.39 | 68 | 74 | 150 |
| $PM_{2.5}$ | 24-hour | 1.2 | 1.5 | Yes | 0.60 | 26.5 | 28 | 35 |
| $PM_{2.5}$ | Annual | 0.3 | 0.21 | No | N/A | N/A | N/A | 15 |
| $SO_2$ | 1-hour | 7.8 | 5.8 | No | N/A | N/A | N/A | 196 |
| $SO_2$ | 3-hour | 25 | 4.9 | No | N/A | N/A | N/A | 1300 |

* Per 40 CFR §51.165(b)(2); for 1-hour $NO_2$, SIL taken from TCEQ's July 22, 2010 "Interim 1-Hour Nitrogen Dioxide ($NO_2$) NAAQS Implementation Guidance"; for 1-hour $SO_2$, SIL taken from TCEQ's August 1, 2010 "Interim 1-Hour Sulfur Dioxide ($SO_2$) NAAQS Implementation Guidance"

** Total Design Concentration equals the sum of the Maximum Modeled Impact and the Ambient Monitoring Background Concentration

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 not modeled because they each have a vapor pressure less than 0.01 mmHg at 40°C and are not volatile enough to be considered air contaminants, per TCEQ guidance.[2] Carbon dioxide, ethane, hydrogen, methane, nitrogen, and propane

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

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 ("$H_2S$")
- 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.

For the proposed project, the maximum predicted off-property concentration from routine emissions of each non-criteria pollutant is below 10% of each constituent's ESL (Table 1-2). For project maintenance, startup, and shutdown ("MSS") emissions, only ammonia has the potential to exceed the ESL at all, and the maximum predicted off property concentration from Project MSS emissions of ammonia is not above the pollutant's ESL for more than 8 hours per year. Per TCEQ's modeling and effects review procedure, no further analysis is required if the maximum off-property concentrations from routine project emissions

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

is less than 10% of an ESL and if the maximum off-property concentration from project MSS emissions is not above an ESL for more than 24 hours per year. Given that the proposed project's off-property concentrations are below those levels, no adverse health effects, odor nuisances, vegetation effects, or materials damage are expected. Accordingly, the emissions of non-criteria pollutants that could result from the proposed MB3 Facility would not result in off-property concentrations that would impact protected resources; thus, the boundary of the Action Area would not be affected by 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 C)**

| Chemical | Cumulative Maximum Off-Property Concentration ($\mu g/m^3$) | ESL ($\mu g/m^3$) | Concentration/ES (%) |
|---|---|---|---|
| 1,3-Butadiene | 7.27E-03 | 510 | 0.0014 |
| 2-Methylnaphthalene | 4.70E-06 | 30 | 0.000016 |
| 3-Methylchloranthrene | 3.56E-07 | 0.02 | 0.0018 |
| 7,12-Dimethylbenz(a)anthracene | 3.18E-06 | 0.5 | 0.00064 |
| Acenaphthene | 2.64E-04 | 1 | 0.026 |
| Acenaphthylene | 9.39E-04 | 1 | 0.094 |
| Acetaldehyde | 1.42E-01 | 90 | 0.16 |
| Acrolein | 1.72E-02 | 3.2 | 0.54 |
| Ammonia | 9.0E-01 (Routine)<br>822 (MSS, only 8 hr/yr) | 170 | 0.53 (Routine)<br>480 (MSS, only 8 hr/yr) |
| Anthracene | 4.70E-07 | 0.5 | 0.000094 |
| Arsenic | 3.94E-05 | 0.1 | 0.039 |
| Benz(a)anthracene | 3.12E-04 | 0.5 | 0.062 |
| Benzene | 1.73E-01 | 170 | 0.10 |
| Benzo(a)pyrene | 3.51E-05 | 0.03 | 0.12 |
| Benzo(b)fluoranthene | 1.87E-05 | 0.5 | 0.0037 |
| Benzo(g,h,i)perylene | 9.11E-05 | 0.5 | 0.018 |
| Benzo(k)fluoranthene | 2.91E-05 | 0.5 | 0.0058 |
| Beryllium | 2.29E-06 | 0.02 | 0.011 |
| Butanes | 132 (Routine)<br>9,376 (MSS) | 23,750 | 0.56 (Routine)<br>39 (MSS) |
| Cadmium | 2.16E-04 | 0.1 | 0.22 |
| Chromium | 2.80E-04 | 3.6 | 0.0078 |
| Chrysene | 6.58E-05 | 0.5 | 0.013 |
| Cobalt | 1.65E-05 | 0.2 | 0.0083 |
| Dibenzo(a,h)anthracene | 1.08E-04 | 0.5 | 0.022 |
| Dichlorobenzene | 2.29E-04 | 720 | 0.000032 |
| Fluoranthene | 1.41E-03 | 0.5 | 0.28 |

## Table 1-3 Summary of Non-criteria Pollutant Air Modeling Results

### (Taken from the Air Emission Dispersion Model in Appendix C)

| Chemical | Cumulative Maximum Off-Property Concentration ($\mu g/m^3$) | ESL ($\mu g/m^3$) | Concentration/ES (%) |
|---|---|---|---|
| Fluorene | 5.21E-07 | 10 | 0.0000052 |
| Formaldehyde | 2.33E-01 | 15 | 1.6 |
| $H_2S$ | 1.55-01 | 108 | 0.14 |
| Hexane (n-) | 3.56E-01 | 5,300 | 0.0067 |
| Hexanes+ | 386 (Routine)<br>1,360 (MSS) | 5,300 | 7.3 (Routine)<br>26 (MSS) |
| Indeno(1,2,3-cd)pyrene | 7.01E-05 | 0.5 | 0.014 |
| Manganese | 7.24E-05 | 2 | 0.0036 |
| Mercury | 4.83E-05 | 0.1 | 0.048 |
| Naphthalene | 1.58E-02 | 440 | 0.0036 |
| Nickel | 4.07E-04 | 0.33 | 0.12 |
| Pentanes | 73 (Routine)<br>2,574 (MSS) | 4,100 | 1.8 (Routine)<br>63 (MSS) |
| Phenanathrene | 3.30E-06 | 0.5 | 0.00066 |
| Pyrene | 8.88E-04 | 0.5 | 0.18 |
| Selenium | 4.70E-06 | 2 | 0.00024 |
| Toluene | 7.64E-02 | 640 | 0.012 |
| Xylenes | 5.29E-02 | 350 | 0.015 |

# 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 federally listed as endangered Whooping Crane, which winters in marshes along the Gulf Coast of Texas, was also evaluated.

**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] | *Chelonia mydas* | Threatened | No |
| Hawksbill Sea Turtle[1] | *Eretmochelys imbricata* | Endangered | No |
| Kemp's Ridley Sea Turtle[1] | *Lepidochelys kempii* | Endangered | No |
| Leatherback Sea Turtle[1] | *Dermochelys coriacea* | Endangered | No |
| Loggerhead Sea Turtle[1] | *Caretta caretta* | Threatened | No |
| Louisiana Black Bear[2] | *Ursus americanus luteolus* | Threatened | No |
| Piping Plover[3] | *Charadrius melodus* | Threatened | No |
| Red Wolf[2] | *Canis rufus* | Endangered | No |
| Smalltooth Sawfish[2] | *Pristis pectinata* | Endangered | No |
| Sprague's Pipit[2] | *Anthus spragueii* | Candidate | No |
| Whooping Crane | *Grus americana* | Endangered | No |

Source: http://www.fws.gov/southwest/es/En dangeredSpecies/EndangeredSpeciesLists/EndangeredSpecies_ListSpecies.cfm and http://www.tpwd.state.tx.us/gis/ris/es/ES_Reports.aspx?county=Chambers

[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, 2012a,b); 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, 2012b).

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, 2012a,b). Additionally, no recent sightings of nesting hawksbill sea turtles have been observed in Chambers County.[4]

### 2.1.3 Kemp's Ridley Sea Turtle (*Lepidochelys kempii*)

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; U.S. Fish and Wildlife Service, 2012ad). 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, 2012a,d). 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.[5]

[4] www.Seaturtle.org, Accessed May 4, 2012.

[5] www.Seaturtle.org, Accessed May 4, 2012.

### 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, 2012). Critical habitat for the leatherback sea turtle has not been designated in Chambers County. Additionally, no recent sightings of nesting leatherback sea turtles have been observed in Chambers County.[6]

### 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, 2012). According to the FWS, the loggerhead sea turtle is known or likely to occur in Chambers County (U.S. Fish and Wildlife Service, 2012a,b).

Loggerhead sea turtles have been reported along the shores of Chambers County and Harris County (University of Texas at Austin, 2012) with undocumented reports of occurrence along the shores in Liberty County (U.S. Fish and Wildlife Service, 2012a,b). 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.[7]

### 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

[6] www.Seaturtle.org, Accessed May 4, 2012.

[7] www.Seaturtle.org, Accessed May 4, 2012.

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 known or likely to occur in Chambers County according to the FWS.

### 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 southeastern edge and northeastern tip of Galveston Island and the southeastern edge of Bolivar Beach on the Bolivar Peninsula (U.S. Fish and Wildlife Service, 2012a and 2012b). 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).

### 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 (NatureServe, 2012). 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, 2012). 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, 2012).

### 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, 2011). 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, 2011). 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 recognized in this county by FWS.

### 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 known or likely to occur in Chambers County according to the FWS and TPWD.

## 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, 2012). 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, 2012). 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 recognized in Chambers County by FWS.

## 2.3 CRITICAL HABITAT

According to the FWS, no critical habitat has been designated within Chambers County.[8] The nearest designated critical habitat to the proposed MB3 Facility is for Piping Plovers and it is located approximately 33 miles south of the proposed MB3 Facility on the Bolivar Peninsula (Galveston County), which is situated between Galveston Bay and the Gulf of Mexico.

[8] http://criticalhabitat.fws.gov/crithab/, Accessed May 2, 2012.

# 3.0 EXISTING ENVIRONMENT

On April 5 and 6, 2012, two biologists 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 MB3 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. Additional separate site visits were completed by two additional personnel from Burns & McDonnell Engineering Co., Inc., on June 18 and 26, 2012.

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 MB3 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 MB3 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.[9] Based on data from the National Land Cover Database ("NLCD"), most of the Action Area consisted of pasture (15 %), grasslands (20 %), developed open space (21 %), and developed (23 %) land uses (Figure 4, Appendix A).[10] A fraction of the Action Area consisted of emergent wetland (8 %), wooded wetlands (5 %), open water (4 %), upland forest (3 %), and scrub-shrub (1 %) land uses. Currently, the site of the MB3 Facility consists of a previously disturbed area that is under construction for the MB2 Facility (Figure 3, Appendix A). Above- and below-ground pipeline transmission corridors,

[9] 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)

[10] National Land Cover Database data downloaded from http://www.mrlc.gov/nlcd2006.php

petroleum wells and pumpjacks, and manmade water storage cells were also present on and adjacent to the proposed MB3 Facility site and within the Action Area. Additional land uses within the Action Area surrounding the proposed MB3 Facility site consist of previously developed or disturbed areas associated with petrochemical facilities, pastures, residential neighborhoods, public road corridors, and retail and commercial establishments (Photographs 1 through 16, Appendix B). 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 2, 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.[11] 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 and the Coastal Water Authority Canal. Both unnamed tributaries to Smith Gully are located on ONEOK property but neither occurs within the footprint of the MB3 Facility. One of the two unnamed tributaries to Smith Gully is located north of the proposed MB3 Facility site and the other is located south of the MB3 Facility site (Figure 2, Appendix A; Photograph 3, Appendix B). Smith Gully, which begins south of Winfree Street, is a tributary to Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). Cedar Bayou Tidal flows into Galveston Bay. The wastewater effluent from the MB3 Facility would be discharged through outfall structures along the unnamed tributaries to Smith Gully located north and south of the MB3 Facility Site (Figures 2 and 3, Appendix A).

A portion of the Coastal Water Authority Canal is located in the Action Area northeast of the proposed MB3 Facility site boundary (Figures 2 and 3, Appendix A; Photograph 6, Appendix B). 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. Secondarily, the Coastal Water Authority Canal provides untreated

[11] Historic Averages for Mont Belvieu, Texas, http://www.intellicast.com/Local/History.aspx?unit=F&location=USTX0908, Accessed December 18, 2012.

surface water to industries and agricultural customers. The canal would be the source of water for the proposed MB3 Facility.

Based on wetland delineations conducted in 2011 and 2012 on ONEOK property by a wetland scientist from Burns & McDonnell, a total of five wetlands are presently located on ONEOK property within the Action Area (Figure 3, Appendix A). All five wetlands are located within the Action Area but would not be directly affected by construction of the MB3 Facility. The five wetlands include a 1.9-acre palustrine forested ("PFO") wetland located north of Winfree Road, a 0.34-acre palustrine emergent ("PEM") wetland along the tributary to Smith Gully located south of the MB3 Facility site, and three small PFO wetlands totaling 0.174 acre (0.15 acre, 0.02 acre, and 0.004 acre) located south of the water treatment cell northeast of the MB3 Facility site. One additional 0.47-acre PEM wetland (shown on Figure 3 in Appendix A) that was located within the footprint of the proposed MB3 Facility was filled as part of the site preparation for the previously permitted MB2 Facility project, in accordance with U.S. Army Corps of Engineers ("USACE") Nationwide Permit 39 ("NWP 39"). Any other potential wetland impacts from the project will be similarly evaluated and permitted by the USACE under its Nationwide Permit program.

## 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.), Johnson grass (*Sorghum halepense*), thistle (*Cirsium* sp.), morning glory (*Ipomoea* sp.), curly dock (*Rumex crispus*), Bermudagrass (*Cynodon dactylon*), Bahiagrass (*Paspalum notatum*), common carpetgrass (*Axonopus fissifolius*), and Vasey's grass (*Paspalum urvillei*).

Woodlands typically included species such as southern magnolia (*Magnolia grandiflora*), pecan (*Carya illinoinensis*), 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*), poisonbean (*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 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 (*Schedonorus phoenix*), Canadian rush (*Juncus canadensis*), rough bentgrass (*Agrostis scabra*), 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*), 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, the soil series occurring within the Action Area include Anahuac silt loam, Morey silt loam (leveled), and Leton silt loam. 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.[12]

## 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 voiciferus*), striped skunk (*Mephitis mephitis*), and eastern cottontail (*Sylvilagus floridanus*). Waterfowl species observed along the Coastal Water Authority Canal North of Mont Belvieu

[12] United States Department of Agriculture, Natural Resources Conservation Services. 2012 *Hydric Soils List*, http://soils.usda.gov/use/hydric/, Accessed December 2012.

included Cattle Egret (*Bubulcus ibis*), Great Blue Herron (*Ardea herodias*), and Little Blue Herron (*Egretta caerulea*).

# 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 results of 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 would cause localized, short-term, and generally minor increases in ambient noise levels in the immediate vicinity of work sites. Construction-related noise would 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 would typically occur during the daytime (between 7:00 a.m. to 7:00 p.m.). Overall, these sound levels would be typical of construction projects.

Noise levels during operation of the MB3 Facility would be comparable to noise levels of existing, similar facilities in the area and would 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 would 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 MB3 Facility would not result in any direct, indirect, or cumulative effects to federally protected species.

## 4.3 WASTEWATER

Wastewater from the OHLP NGL fractionation plant is anticipated to have no adverse impact to the surface water and receptors within the Action Area. 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 D). Information on the receiving water body, regulatory controls, and institutional controls are described below.

Wastewater and storm water discharged though NPDES Outfalls 001 and 002 eventually enter Cedar Bayou Tidal, Segment 0901 of the Trinity- San Jacinto Coastal Basin. The outfall structures do not empty directly into Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). The point at which Smith Gulley empties into Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) is approximately 14.2 river miles upstream from Trinity Bay. The designated uses of Segment 0901 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 a shown below.

### Table 4-1 Applicable Stream Standards for Cedar Bayou Tidal, Segment 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 be compliant 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 Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). 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 Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). The pH range of the effluent from Outfall 001 and 002 will be between 6.5 and 9.0 S.U., which falls within the applicable stream standards for Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). The chemical concentrations in the effluent are not anticipated to result in bacteria loading or algae blooms in Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin). The maximum concentration of ammonia (as nitrogen) and phosphorus is expected to be 0.3 mg/L and 7.7 mg/L in effluent from Outfall 001 and 0.5 mg/L and 1.4 mg/L in effluent from Outfall 002, respectively. No degradation of the designated uses of Segment 0901 is anticipated.

Cedar Bayou Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin) 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 implies that a TMDL is underway, scheduled, or will be scheduled while Category 5c implies 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 Tidal (Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin).

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 states 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 and pH 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 within the Action Area. This finding of no adverse impact is based upon (1) effluent from the Facility will be compliant

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 and quantity from the OHLP fractionation facility will not have any adverse impacts upon threatened or endangered species within the Action Area (Appendix D).

## 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 MB3 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 MB3 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.[13] The proposed MB3 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 and extensive debris fields that resulted from Hurricane Ike in September 2008.[14] The proposed MB3 Facility would 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 would not be directly or indirectly impacted by the proposed MB3 Facility. The proposed MB3 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.

[13] www.Seaturtle.org, Accessed May 4, 2012.

[14] www.Seaturtle.org, Accessed May 4, 2012.

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 and will not be affected by the proposed discharges of construction or operation of the MB3 Facility. Those 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 discharges proposed to be authorized by the Facility's NPDES permit will not affect those threats to threatened or endangered turtle species.

Burns & McDonnell has determined that the proposed MB3 Facility would 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 MB3 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 MB3 Facility.

### 4.4.2 Louisiana Black Bear

The Louisiana black bear would not be impacted by the proposed MB3 Facility. The proposed MB3 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. 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 MB-2 Facility, and the lack of Louisiana black bear habitat within the vicinity of the proposed MB3 Facility, Burns & McDonnell has determined that the proposed MB3 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)[15]. 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 MB3 Facility site are situated within the migratory pathway between breeding grounds and wintering habitats. 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 MB3 Facility.

The proposed MB3 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 MB3 Facility is located in a previously disturbed area that is under construction for the MB2 Facility. (Figure 3, Appendix A). The surrounding Action Area includes existing above- and below-ground pipeline transmission corridors, petroleum wells and pumpjacks, petrochemical facilities, pastures, residential neighborhoods, public road corridors, and retail and commercial establishments. The proposed MB3 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 Piping Plover would not be directly or indirectly impacted by the proposed MB3 Facility. The proposed MB3 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. Burns & McDonnell has determined that the proposed MB3 Facility would have "no effect" on the Piping Plover because of the limited scope of the proposed construction and operation of the MB3 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 MB3 Facility, and the lack of potential Piping Plover habitat within the vicinity of the proposed MB3 Facility.

[15] Elliott-Smith, Elise and Susan M. Haig. 2004. Piping Plover (*Charadrius melodus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/002

### 4.4.4 Red Wolf

The red wolf would not be impacted by the proposed MB3 Facility. This species is thought to be extirpated from the state of Texas and is currently only found in the states of North and South Carolina (NatureServe, 2012). The proposed MB3 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. Considering the limited scope of the proposed construction and operation of the MB3 Facility, and the lack of the red wolf within the vicinity of the proposed MB3 Facility, Burns & McDonnell has determined that the proposed MB3 Facility would 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 MB3 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 MB3 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 smalltooth sawfish would not be directly or indirectly impacted by the proposed MB3 Facility. The proposed MB3 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 would 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 MB3 Facility would have "no effect" on the smalltooth sawfish because of the limited scope of the proposed construction and operation of the MB3 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 MB3 Facility.

### 4.4.6 Whooping Crane

The MB3 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 MB3 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 MB3 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 MB3 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 MB3 Facility site are situated within the migratory pathway between breeding grounds and wintering habitats. Although critical 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 MB3 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 would be affected by the proposed MB3 Facility.

# 5.0 CONCLUSIONS AND DETERMINATION

Construction and operation of the proposed MB3 Facility would 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 MB3 Facility would not result in the incidental take or mortality of any federally protected species or the loss of designated critical habitat. The proposed MB3 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 of the federally listed species. The construction and operation of the proposed MB3 Facility is not expected to result in a significant increase in the need for additional infrastructure or induce the growth of Mont Belvieu that could result in direct, indirect, or cumulative impacts to federally protected resources. The areas surrounding the proposed MB3 Facility consist of previously disturbed and developed areas and do not include adjacent habitats that would be used by federally protected species.

## 5.1 DETERMINATION OF EFFECT

Considering the limited scope of the proposed MB3 Project, the nature and relatively low levels of noise, emissions and discharged water that would result from operation of the proposed MB3 Facility, the already heavily industrialized nature of the area within the City of Mont Belvieu where the proposed MB3 Facility is located, and the lack of potential protected species habitat at the proposed MB3 Facility site and within the Action Area, Burns & McDonnell has determined that the proposed MB3 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 5-1).

**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 | *Chelonia mydas* | Threatened | No | No Effect |
| Hawksbill Sea Turtle | *Eretmochelys imbricata* | Endangered | No | No Effect |
| Kemp's Ridley Sea Turtle | *Lepidochelys kempii* | Endangered | No | No Effect |
| Leatherback Sea Turtle | *Dermochelys coriacea* | Endangered | No | No Effect |
| Loggerhead Sea Turtle | *Caretta caretta* | Threatened | No | No Effect |
| Louisiana Black Bear | *Ursus americanus luteolus* | Threatened | No | No Effect |
| Piping Plover | *Charadrius melodus* | Threatened | No | No Effect |
| Red Wolf | *Canis rufus* | Endangered | No | No Effect |
| Smalltooth Sawfish | *Pristis pectinata* | Endangered | No | No Effect |
| Whooping Crane | *Grus americana* | Endangered | No | No Effect |

## 5.2 INTERDEPENDENT AND INTERRELATED ACTIONS

The proposed MB3 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 MB3 Facility.

## 5.3 CUMULATIVE EFFECTS

The proposed MB3 Facility is located within an industrial area in Mont Belvieu that has historically been and is currently used for petroleum production (natural gas and petroleum pipelines and pumpjacks) and is the location of several existing, operational petrochemical facilities. Construction and operation of the already-existing industrial facilities in the area has likely cumulatively affected the terrestrial and aquatic habitats in the vicinity of the proposed MB3 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 likely to experience future 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 MB3 Facility that could result in cumulative effects that would negatively impact any of the species considered in this Biological Assessment.

# 6.0 LITERATURE CITED

Campbell, L. 2003. Endangered and Threatened Animals of Texas: Their Life History and Management.

Davis, W.B. and D.J. Schmidly. 1994. The Mammals of Texas (Online Ed.). Texas Parks and Wildlife Department. http://www.nsrl.ttu.edu/tmot1/balaphys.htm. Accessed 2012 May 02.

Earnst C.H. and R.W. Barbour. 1989. Turtles of the World. Smithsonian Institution Press. Washington, D.C. 313 p.

Earnst, C.H., J.E. Lovisch, and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Institution Press. Washington, D.C. 578 p.

Larkin, T.J. and G.W. Bomar. 1983. Climatic Atlas of Texas. LP-192. Texas Department of Water Resources. Austin Texas. 151 p.

Natureserve. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, VA. U.S.A. Available http://www.natureserve.org/explorer. Accessed 2012 Mar 15.

National Oceanic and Atmospheric Administration. 2011. Smalltooth Sawfish (*Pristis pectinata*). http://www.nmfs.noaa.gov/pr/species/fish/smalltoothsawfish.htm. Accessed May 29, 2012.

Texas Parks and Wildlife Department. 2012. Piping Plover (*Charadrius melodus*). Texas Parks and Wildlife Department Austin, Texas. http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013.pdf Accessed March 15, 2012.

U.S. Fish and Wildlife Service. 2012a. Endangered species lists. http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=TX. Accessed 2012 Mar 15.

U.S. Fish and Wildlife Service. 2012b. Wildlife fact sheet. http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/hawksbill-sea-turtle.htm. Accessed 2012 Mar 15.

U.S. Fish and Wildlife Service. 2011. Piping Plover (*Charadrius melodus*). Retrieved May 2, 2012, from http://www.fws.gov/southwest/es/oklahoma/plover.htm.

University of Texas at Austin, Texas Natural Science Center, Herps of Texas. Loggerhead Sea Turtle (Caretta caretta). http://www.herpsoftexas.org/content/loggerhead-sea-turtle. Accessed 2012 Mar 15.

# 7.0 LIST OF PREPARERS

Brian Roh, B.S., M.S.
Senior Biologist
Burns & McDonnell Engineering Co., Inc.

Robert (Bo) Cooper, B.S.
Staff Biologist
Burns & McDonnell Engineering Co., Inc.

Jeff Miller, B.S., M.S.
Assistant Biologist
Burns & McDonnell Engineering Co., Inc.

Rod Fraser, B.S., M.A.
Senior GIS Specialist
Burns & McDonnell Engineering Co., Inc.

Sarah Gilstrap, B.S., M.S.
Wetland Scientist
Burns & McDonnell Engineering Co., Inc.

# APPENDIX A - FIGURES

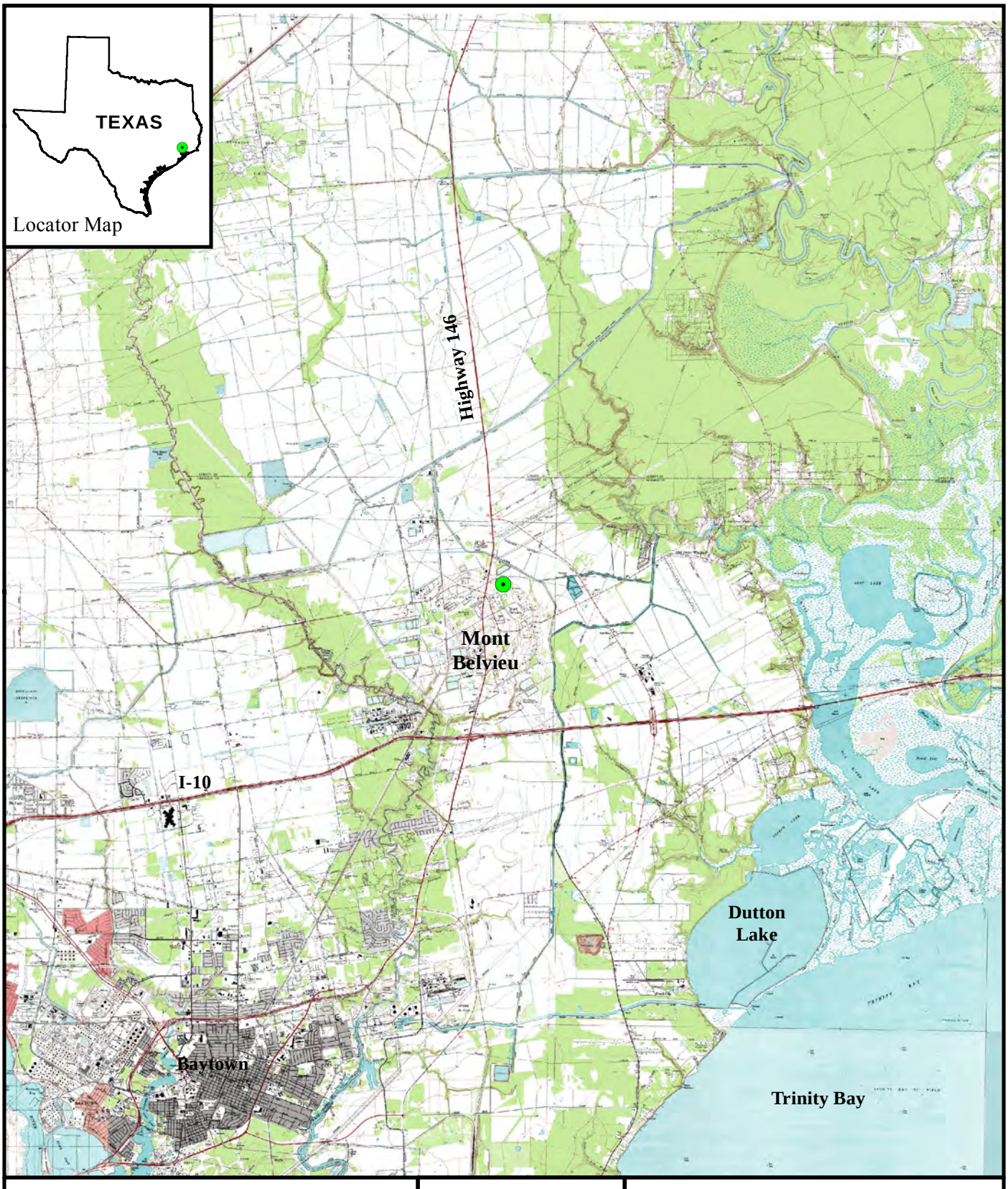
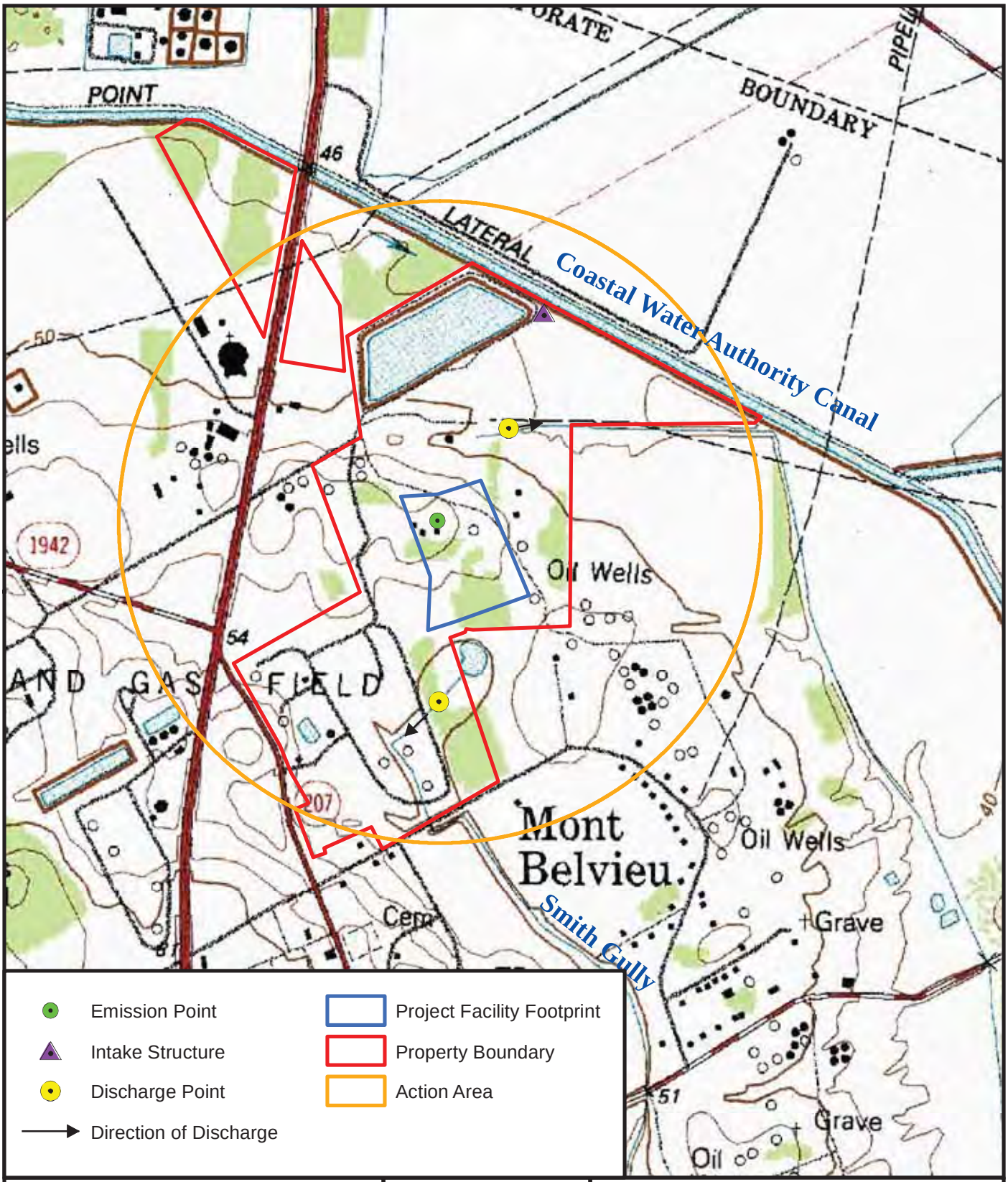



Figure 1
Site Location Map
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Plant
Chambers County, Texas

Source: USGS 1:24,000 Topographic Quadrangle: Mont Belvieu (1994); Burns & McDonnell.

June 18, 2012

V:\ONEOK\66806_Mt_Belvieu\GIS\DataFiles\ArcDocs\Site_Location_Map.mxd




\\ESPSRV\Data\Data2\Projects\OneOK\666806_Mt_Belvieu\GIS\DataFiles\ArcDocs\Action_Area_Topo_Map_BROH.mxd

Figure 2
Action Area
Topographic Map
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

Source: USGS 1:24,000 Topographic Quadrangle: Mont Belvieu (1994); Burns & McDonnell.

April 17, 2013

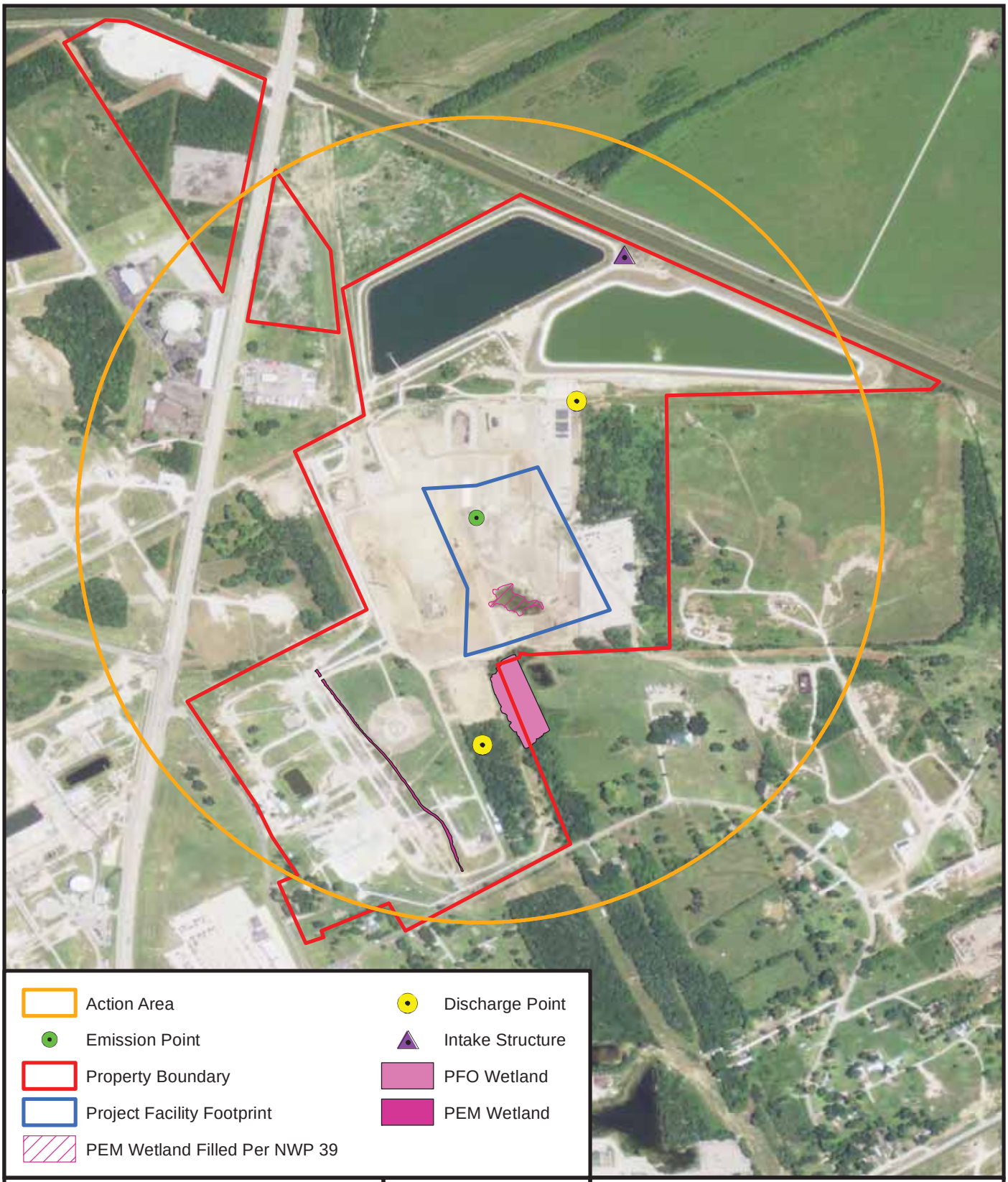
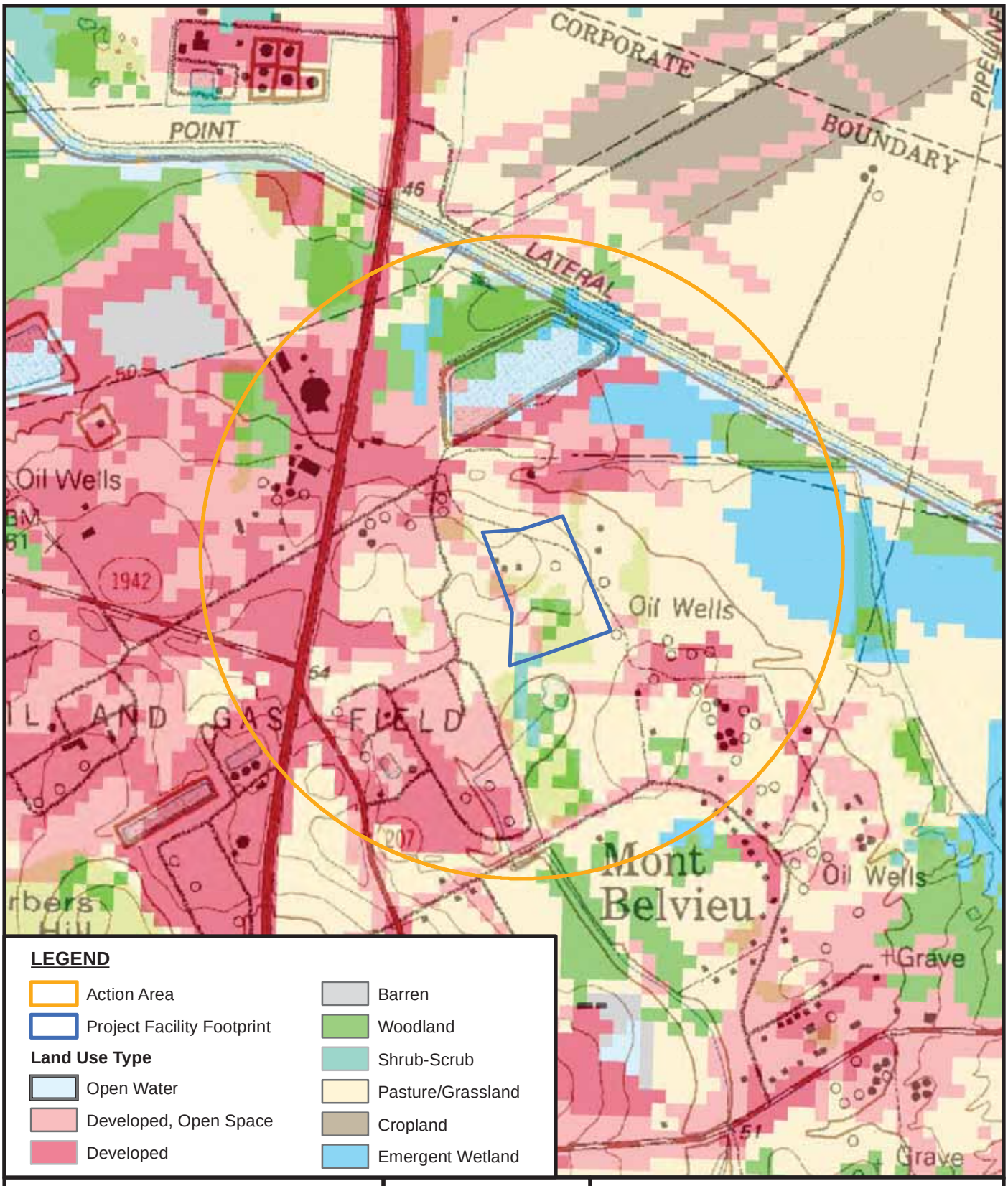



Figure 3
Action Area
Aerial Photograph
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

Source: USDA NAIP 2012 Aerial Photography; Burns & McDonnell.

April 17, 2013

\\ESPSRV\Data\Data2\Projects\OneOK\66806_Mt_Belvieu\GIS\DataFiles\ArcDocs\Action_Area_Aerial_Map_BROH.mxd




0 500 1,000
Feet

NORTH

Burns & McDonnell
SINCE 1898

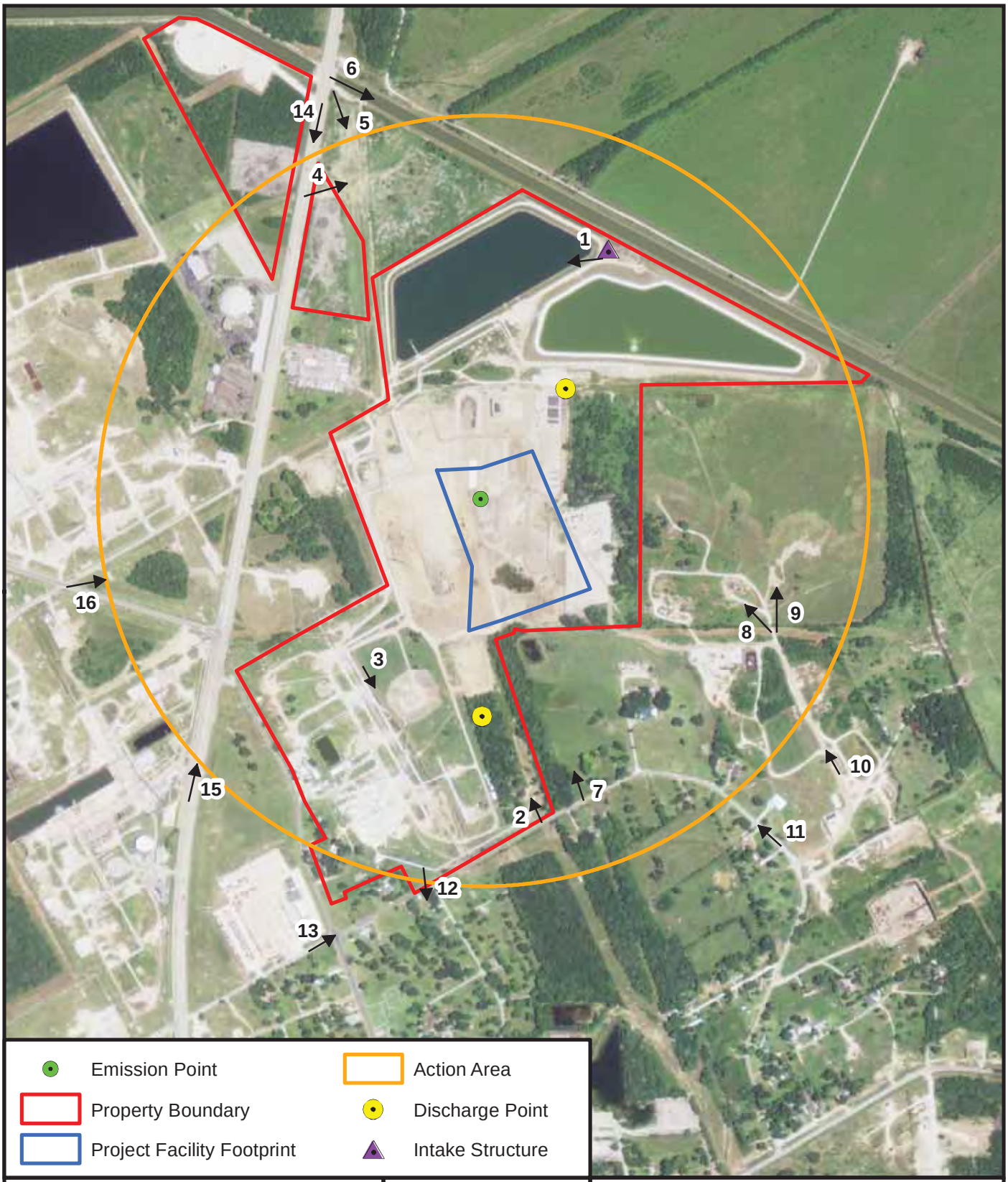
Figure 4
Land Use
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

V:\OneOK\66806_Mt_Belvieu\GIS\DataFiles\ArcDocs\Land_Use_Topo_Map.mxd

Source: USGS 1:24,000 Topographic Quadrangle: Mont Belvieu (1994); NLCD 2006; Burns & McDonnell.

November 28, 2012

# APPENDIX B - PHOTOGRAPHS




Appendix B
Action Area Photographs
ONEOK Hydrocarbon, L.P.
Mont Belvieu NGL Fractionation Facility
Chambers County, Texas

\\ESPSRV\Data\Data2\Projects\OneOK\66806_Mt_Belvieu\GIS\DataFiles\ArcDocs\Appendix_B 19Dec2012.mxd

Source: USDA NAIP 2012 Aerial Photography; Burns & McDonnell.

April 17, 2013


Photograph 1: View west across the treated water cell north of the proposed MB3 Facility site.

Photograph 2: ONEOK property south of the proposed MB3 Facility site. The photograph was taken from Winfree Street and is within the Action Area.

| | | |
|---|---|---|
| **ONEOK**<br>**Mont Belvieu Natural Gas Liquids Fractionation Facility**<br>**Mont Belvieu, Chambers County, Texas** | Burns & McDonnell SINCE 1898 | **Site Photographs**<br>**June 2012 and**<br>**April 2012** |


Photograph 3: View south along the unnamed tributary to Smith Gully located south of the proposed MB3 Facility. One of the two proposed outfalls for the MB3 Facility will empty into this unnamed tributary to Smith Gully.

Photograph 4: View east across ONEOK property on the east side of Highway 146 and northwest of the MB3 Facility site. This area is just outside of the Action Area.

| | | |
|---|---|---|
| **ONEOK**<br>**Mont Belvieu Natural Gas Liquids Fractionation Facility**<br>**Mont Belvieu, Chambers County, Texas** | Burns & McDonnell SINCE 1898 | **Site Photographs**<br>**June 2012 and**<br>**April 2012** |

Photograph 5: Typical pasture in the vicinity of the proposed Project. This pasture is located north of the proposed MB3 Facility site and just outside of the Action Area.

Photograph 6: View east along Coastal Water Authority Canal, located north of the proposed MB3 Facility. The portion of this canal within this photograph is just outside of the Action Area.

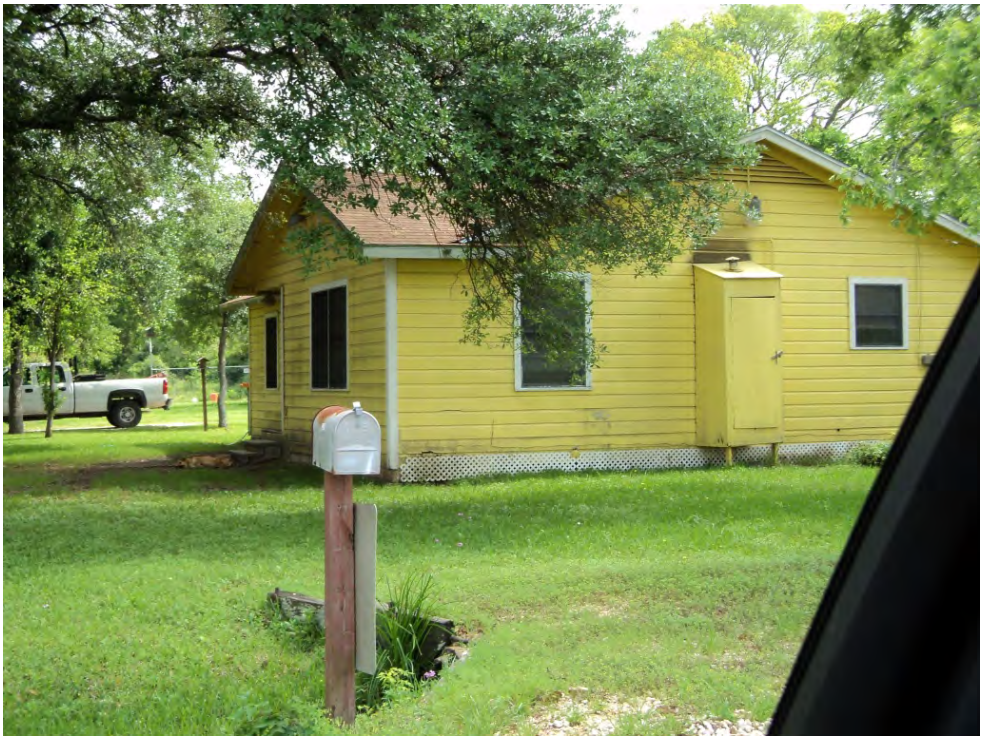
Photograph 7: Open pasture south of the proposed MB3 Facility site and within the Action Area. The photograph was taken from Winfree Street.


Photograph 8: View northwest across an open grassy field east of the proposed MB3 Facility site.


Photograph 9: View northeast across an open grassy field east of the proposed MB3 Facility site.


Photograph 10: View northwest along a private road west of Winfree Street. Photograph taken southeast of the proposed MB3 Facility site and just outside of the Action Area.


Photograph 11: View northwest along Winfree Street. Photograph taken southeast of the proposed MB3 Facility site and just outside of the Action Area.



Photograph 12: View south of a typical residence along Winfree Street. This residence is just outside of the Action Area.


Photograph 13: View east along Winfree Street, south of the proposed MB3 Facility site. This intersection is just outside of the Action Area.

Photograph 14: View south along Highway 146 west of the proposed MB3 Facility site. This stretch of Highway 146 is at the northwest edge of the Action Area.


Photograph 15: View north along Highway 146 southwest of the proposed MB3 Facility site. This stretch of Highway 146 is at the southwest edge of the Action Area.


Photograph 16: View east from the intersection of Fitzgerald Road and Farm to Market 1942. Photograph taken just outside of the Action Area, west of the proposed MB3 Facility site.

# APPENDIX C - AIR MODELING REPORT

WAID ENVIRONMENTAL

# Texas Commission on Environmental Quality (TCEQ)
# Atmospheric Dispersion Modeling Analysis

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

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

December 2012
Revised: April 2013

Prepared by:


Miranda L. Cheatham, P.E.
Senior Engineer



04/16/2013

Waid Corporation dba Waid Environmental
Certificate of Registration No. F-58

www.waid.com


**AUSTIN OFFICE**
10800 PECAN PARK BLVD., SUITE 300
AUSTIN, TEXAS 78750
512.255.9999 • 512.255.8780 FAX

**HOUSTON OFFICE**
2600 SOUTH SHORE BLVD., SUITE 300
LEAGUE CITY, TEXAS 77573
281.333.9990 • 512.255.8780 FAX

**MIDLAND OFFICE**
24 SMITH ROAD, SUITE 304
MIDLAND, TEXAS 79705
432.682.9999 • 432.682.7774 FAX

TABLE OF CONTENTS

(In order, as listed in Appendix F
of TCEQ Air Quality Modeling Guidelines, February 1999)

# SECTION 1.0

## PROJECT IDENTIFICATION INFORMATION

**Applicant:** ONEOK Hydrocarbon, L.P.

Contact: Terrie Blackburn
Manager, Regulatory Compliance ESH
100 West 5th Street
Tulsa, OK 74103
(918) 561-8052
Terrie.Blackburn@oneok.com

**Facility:** Mont Belvieu NGL Fractionation Plant

**Permit Application No.:** Proposed TCEQ Permit No. 106921

**Nearest City and County:** Mont Belvieu, Chambers County

**Modeler:** Waid Environmental Contact:

Miranda L. Cheatham, P.E.
Senior Engineer
10800 Pecan Park Blvd., Ste 300
Austin, TX 78750
(512) 255-9999
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 "MB3 Facility" or "Project") will consist of an additional fractionation train. 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 submitted to TCEQ on November 15, 2012, February 28, 2013, and April 16, 2013. Copies of the modeling input tables are provided in Appendix A of this report.

### 2.1 Type of Permit Review

The proposed MB3 Facility Project triggers Prevention of Significant Deterioration (PSD) review for greenhouse gases (GHGs).

### 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). The applicable pollutants and averaging times are[1]:

- CO, 1-hr
- CO, 8-hr
- $NO_2$, 1-hr
- $NO_2$, annual
- Ozone, 8-hr (modeling not conducted because Project increase is less than 100 tpy of $NO_x$ and VOC)
- $PM_{10}$, 24-hr
- $PM_{2.5}$, 24-hr
- $PM_{2.5}$, Annual
- $SO_2$, 1-hr
- $SO_2$, 3-hr

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

This air dispersion modeling analysis predicted Project concentrations that would be higher than the 1-hr $NO_2$, 24-hr $PM_{10}$ and 24-hr $PM_{2.5}$ Significant Impact Levels (SILs). Therefore, a representative ambient monitoring background concentration was determined for these pollutants and averaging times. The figure included at the end of this section maps the location of the monitoring stations in relation to the proposed MB3 Facility. The table included at the end of this section summarizes the monitoring results.

$NO_2$

An inventory of available $NO_2$ monitoring stations was obtained from EPA's AirData website[2] and from TCEQ's GeoTAM Viewer[3]. The $NO_2$ monitor closest to the proposed MB3 Facility is at 4727 Wallisville Road, and it was chosen as the representative monitor. The monitor is located approximately 10 km southwest of the proposed MB3 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 closer to the Houston Ship Channel) and with a similar population to the Project site. The topography at the monitoring site is similar to the topography at the Project site.

The most recent 3 years of monitoring data (2010-2012) were used. The maximum 1-hr average concentration value for each year was averaged to determine the representative 1-hr background concentration of 97 µg/m$^3$.

$PM_{10}$

An inventory of available $PM_{10}$ monitoring stations was obtained from EPA's AirData website[4]. The $PM_{10}$ monitor closest to the proposed MB3 Facility is at 4514 Durant Street, and it was chosen as the representative monitor. The monitor is located approximately 31 km southwest of the proposed MB3 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 south of the Houston Ship Channel) and a greater population (it is within the greater Houston area) than the Project site. The topography at the monitoring site is similar to the topography at the Project site.

The most recent 3 years of monitoring data (2010-2012) were used. The maximum 24-hr average concentration value for each year was averaged to determine the representative 24-hr background concentration of 68 µg/m$^3$.

[2] http://www.epa.gov/airquality/airdata/ad_rep_mon.html
[3] http://gis3.tceq.state.tx.us/geotam/index.html
[4] http://www.epa.gov/airquality/airdata/ad_rep_mon.html

$PM_{2.5}$

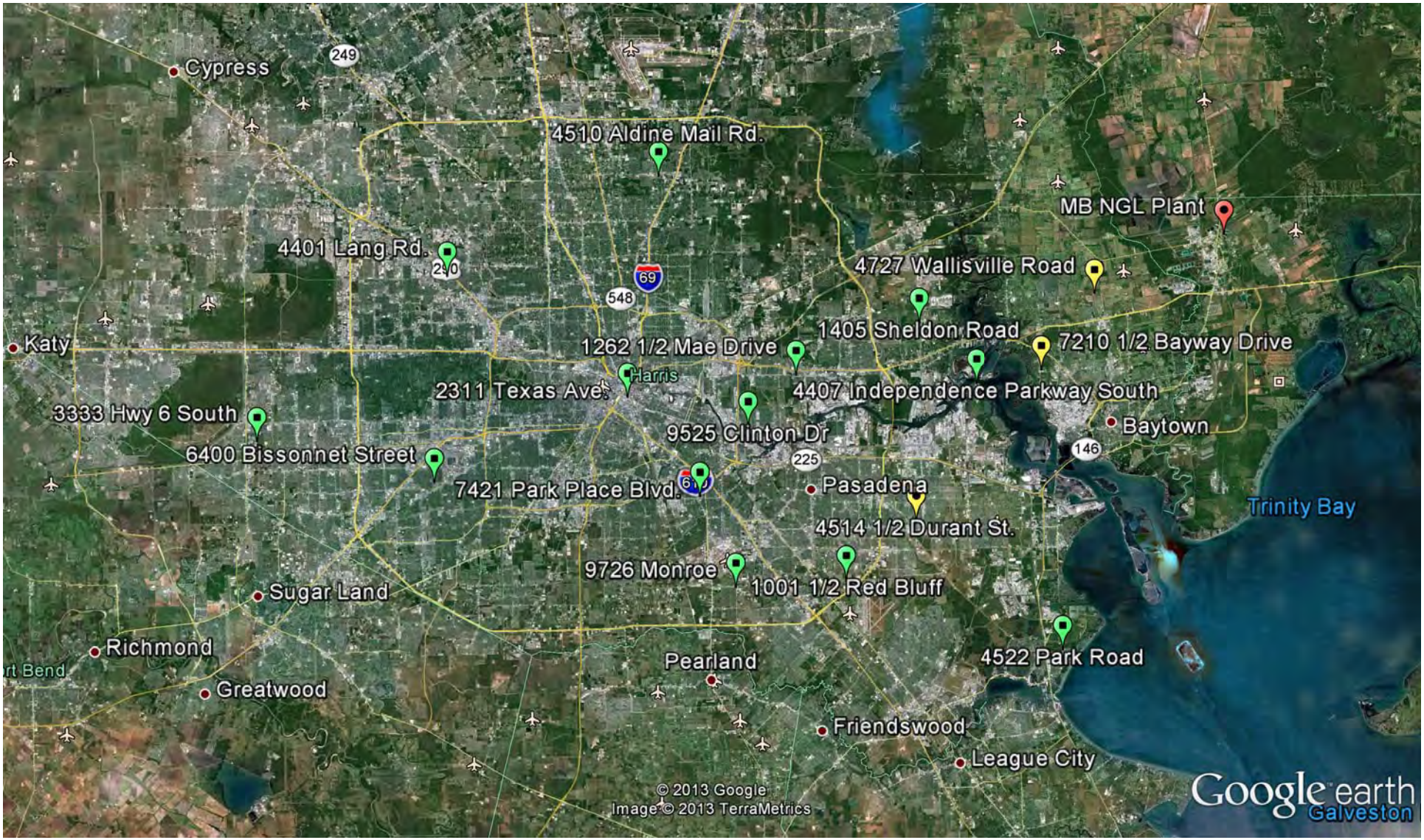
An inventory of available $PM_{2.5}$ monitoring stations was obtained from EPA's AirData website[4]. The $PM_{2.5}$ monitor closest to the proposed MB3 Facility is at 7210 Bayway Drive, and it was chosen as the representative monitor. The monitor is located approximately 17 km southwest of the proposed MB3 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.

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 $\mu g/m^3$.

[4] http://www.epa.gov/airquality/airdata/ad_rep_mon.html

**Summary of Monitoring Data**

| Pollutant | Monitor ID | Latitude | Longitude | City | County | Distance from Site (km) | Year of Monitored Data | Max ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|
| $NO_2$ | 4727 Wallisville Road | 29.8214 | -94.9900 | Baytown | Harris | 20 | 2012 | 92.9 |
| | | | | | | | 2011 | 100.0 |
| | | | | | | | 2010 | 97.6 |
| | | | | | | | **3-yr Average of Max 1-hr Values** | **97** |
| $PM_{10}$ | 4514 1/2 Durant St. | 29.6700 | -95.1283 | Deer Park | Harris | 31 | 2012 | 78 |
| | | | | | | | 2011 | 56 |
| | | | | | | | 2010 | 70 |
| | | | | | | | **3-yr Average of Max 24-hr Values** | **68** |
| $PM_{2.5}$ | 7210 1/2 Bayway Drive | 29.7706 | -95.0311 | Baytown | Harris | 17 | 2012 | 28.6 |
| | | | | | | | 2011 | 23.2 |
| | | | | | | | 2010 | 27.6 |
| | | | | | | | **3-yr Average of Max 24-hr Values** | **26.5** |




Google Earth Pro

miles 30
km 60

# 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

Except for emergency engines, 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 MB3 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.

The emergency engines were not included in the 1-hr $NO_2$ modeling demonstration 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. Exclusion of the intermittent emergency engine emission sources from the modeling demonstration 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."

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. Storage tank and truck loading emissions 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 ID FUG03) were modeled as an area source with dimensions that encompass the unit boundary.

Residual VOC MSS emissions to atmosphere (model ID MSSFUG2) were modeled by conservatively assuming that all of the emissions would be concentrated and released from the vessel predicted to have the largest charge capacity (by weight) in the Fractionation Unit. Residual $NH_3$ MSS emissions to atmosphere (model ID MSSNH3FU) were modeled by conservatively assuming all the emissions would be concentrated and released from the 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. All of these process vent emissions are conservatively assumed to be emitted from heater H-04, which is the heater closest to the property line. The process heaters were modeled with the worst case emissions from normal or maintenance, startup, shutdown (MSS) operation. 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 source was 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 tower, tanks, and loading spots 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 12060. 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 GeoTIFF file obtained from the USGS' Seamless Data Server[5].



[5] http://seamless.usgs.gov/website/seamless/viewer.htm

# 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 then used out to 1,000 meters from the property line.

# SECTION 12.0

## METEOROLOGICAL DATA

Meteorological data for Chambers County was obtained from the TCEQ's website[6] and used in the modeling analysis. Meteorological data for Chambers County uses surface data from Houston Intercontinental (IAH) and upper air data from Lake Charles (LCH). The surface station base elevation is 122 feet.

To develop their meteorological data files, TCEQ processed the surface and upper air data using AERMET (version 06341). TCEQ provides three different meteorological data sets – low, medium, and high surface roughness. The AERSURFACE program (dated 08009) was run to determine which data set to use.

Land cover data was obtained from the USGS NLCD92 archives[7]. AERSURFACE was run using this land cover data and a default 1 km radius from the center of the plant. The resulting surface roughness length of 0.088 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 concatenated meteorological data. Non-criteria pollutant modeling was performed using a single year of meteorological data.

[6] http://www.tceq.texas.gov/permitting/air/modeling/aermod_datasets.html
[7] http://landcover.usgs.gov/us_map.php

# 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 MB3 Facility 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, a representative ambient monitoring background concentration is added, and the resulting total design concentration is compared to the secondary NAAQS standard. The emission point centroid (317420 m E, 3304737 m N) was used as the center point to define the Radius of Significant Impact. The 1-hr $NO_2$ analysis yields the largest Radius of Significant Impact (0.71 km).

CO, 1-hr

1-hr CO modeling was performed using five years of concatenated meteorological data. The maximum 1-hr average concentration from any of the modeled years was 158 µg/m$^3$, which is below the SIL of 2,000 µg/m$^3$.

CO, 8-hr

8-hr CO modeling was performed using five years of concatenated meteorological data. The maximum 8-hr average concentration from any of the modeled years was 91 µg/m$^3$, which is below the SIL of 500 µg/m$^3$.

$NO_2$, 1-hr

1-hr $NO_2$ modeling was performed using five years of concatenated meteorological data. The maximum 1-hr average concentration from any of the modeled years was 8.2 µg/m$^3$, which is above the SIL of 7.5 µg/m$^3$. The Radius of Significant Impact extends 0.71 km.

$NO_2$, annual

Annual $NO_2$ modeling was performed using five years of concatenated meteorological data. The annual concentration averaged over the modeled years was 0.2 µg/m$^3$, which is below the SIL of 1.0 µg/m$^3$.

$PM_{10}$, 24-hr

24-hr $PM_{10}$ modeling was performed using five years of concatenated meteorological data. The highest 24-hr average concentration from any of the modeled years was 5.8 µg/m$^3$, which is above the SIL of 5 µg/m$^3$. The Radius of Significant Impact extends 0.39 km.

$PM_{2.5}$, 24-hr

24-hr $PM_{2.5}$ modeling was performed using five years of concatenated meteorological data. The maximum 24-hr average concentration from any of the modeled years was 1.5 µg/m$^3$, which is above the SIL of 1.2 µg/m$^3$. The Radius of Significant Impact extends 0.6 km.

$PM_{2.5}$, Annual

Annual $PM_{2.5}$ modeling was performed using five years of concatenated meteorological data. The annual average concentration averaged over the modeled years was 0.21 µg/m$^3$, which is below the SIL of 0.3 µg/m$^3$.

$SO_2$, 1-hr

1-hr $SO_2$ modeling was performed using five years of concatenated meteorological data. The highest 1-hr average concentration from any of the modeled years was 5.8 µg/m$^3$, which is below the SIL of 7.8 µg/m$^3$.

$SO_2$, 3-hr

3-hr $SO_2$ modeling was performed using five years of concatenated meteorological data. The highest 3-hr average concentration from any of the modeled years was 4.9 µg/m$^3$, which is below the SIL of 25 µg/m$^3$.

**Summary of Criteria Pollutant Modeling Results**

| Pollutant | Averaging Time | SIL [a,b,c] ($\mu g/m^3$) | Max Modeled Concentration ($\mu g/m^3$) | Max Modeled Concentration Above SIL? | Radius of Significant Impact (km) | Ambient Monitoring Background Concentration ($\mu g/m^3$) | Total Design Concentration ($\mu g/m^3$) | NAAQS Standard ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|
| CO | 1-hr | 2,000 | 158 | No | N/A | N/A | N/A | 40,000 |
| CO | 8-hr | 500 | 91 | No | N/A | N/A | N/A | 10,000 |
| $NO_2$ | 1-hr | 7.5 | 8.2 | Yes | 0.71 | 97 | 105 | 188 |
| $NO_2$ | Annual | 1 | 0.2 | No | N/A | N/A | N/A | 100 |
| $PM_{10}$ | 24-hr | 5 | 5.8 | Yes | 0.39 | 68 | 74 | 150 |
| $PM_{2.5}$ | 24-hr | 1.2 | 1.5 | Yes | 0.6 | 26.5 | 28.0 | 35 |
| $PM_{2.5}$ | Annual | 0.3 | 0.21 | No | N/A | N/A | N/A | 15 |
| $SO_2$ | 1-hr | 7.8 | 5.8 | No | N/A | N/A | N/A | 196 |
| $SO_2$ | 3-hr | 25 | 4.9 | No | N/A | N/A | N/A | 1300 |

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

[b] For 1-hr $NO_2$, from TCEQ's July 22, 2010 "Interim 1-Hour Nitrogen Dioxide ($NO_2$) NAAQS Implementation Guidance"

[c] For 1-hr $SO_2$, from TCEQ's August 1, 2010 "Interim 1-Hour Sulfur Dioxide ($SO_2$) NAAQS Implementation Guidance"

***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 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.[8] 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.[9]

New and increased emissions from the proposed MB3 Facility Project were modeled, and the resulting concentrations were compared to the appropriate Effects Screening Level (ESL) given by the TCEQ.[10] 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 diesel engines was modeled as its own source group and the natural gas combustion sources (Model IDs FL01, H04, H05, and H06) were collected into source group NATGAS. VOC emissions from each source were modeled. Because only one of the emergency diesel engines is expected to operate in a single hour, the engine with the highest off-property concentration (Model ID ENG06) was used for the scaling analysis.

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.

[8] http://www.tceq.texas.gov/assets/public/permitting/air/memos/vapor4.pdf
[9] http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/mera.pdf
[10] http://www.tceq.texas.gov/toxicology/esl/list_main.html#esl_1; the list used in this analysis is dated 3/22/12.

$$Off-property\ impact\ of\ pollutant\ i =$$

$$(Off-property\ impact\ of\ VOC\ from\ ENG06)\left(\frac{emission\ rate\ of\ pollutant\ i\ from\ ENG06}{emission\ rate\ of\ VOC\ from\ ENG06}\right)$$
$$+$$
$$(Off-property\ impact\ of\ VOC\ from\ nat.gas\ combustion)\left(\frac{emission\ rate\ of\ pollutant\ i\ from\ nat.gas\ combustion}{emission\ rate\ of\ VOC\ from\ nat.gas\ combustion}\right)$$

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 ($H_2S$),
- Hexanes and heavier (Hexanes+), and
- Pentanes

The maximum predicted off-property concentration from routine Project emissions of each non-criteria pollutant is below 10% of the pollutant's ESL. For Project MSS emissions, only ammonia is predicted to exceed the ESL at all, and the maximum predicted concentration from Project MSS emissions of ammonia is not above the pollutant's ESL for more than 8 hours per year. 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. Therefore, 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 ($\mu g/m^3$) |
|---|---|
| ENG06 | 163.56883 |
| Group NATGAS | 0.39395 |

| | | ENG06 | | | Group NATGAS | | | Chemical-Specific Modeling | Overall Model Results | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Group for Modeling | Speciated Emissions (lb/hr) | Emissions as Wt. Frac. Of VOC (-) | Maximum Off-Property Concentration ($\mu g/m^3$) | Speciated Emissions (lb/hr) | Emissions as Wt. Frac. Of VOC (-) | Maximum Off-Property Concentration ($\mu g/m^3$) | Maximum Off-Property Concentration ($\mu g/m^3$) | Cumulative Maximum Off-Property Concentration ($\mu g/m^3$) | ESL ($\mu g/m^3$) | Concentration as % of ESL (%) |
| Total VOC | 1-Scaling | 3.80E+00 | 1.00E+00 | | 9.35E-01 | 1.00E+00 | | | | | |
| 1,3-Butadiene | 1-Scaling | 1.69E-04 | 4.45E-05 | 7.27E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.27E-03 | 510 | 1.4E-03 |
| 2-Methylnaphthalene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.12E-05 | 1.19E-05 | 4.70E-06 | | 4.70E-06 | 30 | 1.6E-05 |
| 3-Methylchloranthrene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 3.56E-07 | 0.02 | 1.8E-03 |
| 7,12-Dimethylbenz(a)anthracene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.54E-06 | 8.06E-06 | 3.18E-06 | | 3.18E-06 | 0.5 | 6.4E-04 |
| Acenaphthene | 1-Scaling | 6.12E-06 | 1.61E-06 | 2.63E-04 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 2.64E-04 | 1 | 2.6E-02 |
| Acenaphthylene | 1-Scaling | 2.18E-05 | 5.74E-06 | 9.38E-04 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 9.39E-04 | 1 | 9.4E-02 |
| Acetaldehyde | 1-Scaling | 3.31E-03 | 8.71E-04 | 1.42E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.42E-01 | 90 | 1.6E-01 |
| Acrolein | 1-Scaling | 3.99E-04 | 1.05E-04 | 1.72E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.72E-02 | 3.2 | 5.4E-01 |
| Ammonia | 2-Ammonia, chemical-specific | | | | | | | 0.90 (Routine) 822 (MSS, 8 hr/yr only) | 0.90 (Routine) 822 (MSS, 8 hr/yr only) | 170 | 5.3E-01 (Routine), 4.8E+02 (MSS, 8 hr/yr only) |
| Anthracene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.12E-06 | 1.19E-06 | 4.70E-07 | | 4.70E-07 | 0.5 | 9.4E-05 |
| Arsenic | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.35E-05 | 1.00E-04 | 3.94E-05 | | 3.94E-05 | 0.1 | 3.9E-02 |
| Benz(a)anthracene | 1-Scaling | 7.24E-06 | 1.91E-06 | 3.12E-04 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 3.12E-04 | 0.5 | 6.2E-02 |
| Benzene | 1-Scaling | 4.02E-03 | 1.06E-03 | 1.73E-01 | 9.65E-04 | 1.03E-03 | 4.07E-04 | | 1.73E-01 | 170 | 1.0E-01 |
| Benzo(a)pyrene | 1-Scaling | 8.10E-07 | 2.13E-07 | 3.49E-05 | 5.43E-07 | 5.81E-07 | 2.29E-07 | | 3.51E-05 | 0.03 | 1.2E-01 |
| Benzo(b)fluoranthene | 1-Scaling | 4.27E-07 | 1.12E-07 | 1.84E-05 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 1.87E-05 | 0.5 | 3.7E-03 |
| Benzo(g,h,i)perylene | 1-Scaling | 2.11E-06 | 5.55E-07 | 9.08E-05 | 5.43E-07 | 5.81E-07 | 2.29E-07 | | 9.11E-05 | 0.5 | 1.8E-02 |
| Benzo(k)fluoranthene | 1-Scaling | 6.68E-07 | 1.76E-07 | 2.88E-05 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 2.91E-05 | 0.5 | 5.8E-03 |
| Beryllium | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.43E-06 | 5.81E-06 | 2.29E-06 | | 2.29E-06 | 0.02 | 1.1E-02 |
| Butanes | 3-Butanes, chemical-specific | | | | | | | 132 (Routine), 9376 (MSS) | 132 (Routine), 9376 (MSS) | 23750 | 5.6E-1 (Routine), 3.9E+1 (MSS) |
| Cadmium | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.13E-04 | 5.48E-04 | 2.16E-04 | | 2.16E-04 | 0.1 | 2.2E-01 |
| Chromium | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.64E-04 | 7.10E-04 | 2.80E-04 | | 2.80E-04 | 3.6 | 7.8E-03 |
| Chrysene | 1-Scaling | 1.52E-06 | 4.00E-07 | 6.54E-05 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 6.58E-05 | 0.5 | 1.3E-02 |
| Cobalt | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.92E-05 | 4.19E-05 | 1.65E-05 | | 1.65E-05 | 0.2 | 8.3E-03 |
| Dibenzo(a,h)anthracene | 1-Scaling | 2.51E-06 | 6.61E-07 | 1.08E-04 | 5.43E-07 | 5.81E-07 | 2.29E-07 | | 1.08E-04 | 0.5 | 2.2E-02 |
| Dichlorobenzene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.43E-04 | 5.81E-04 | 2.29E-04 | | 2.29E-04 | 720 | 3.2E-05 |

| | Maximum 1-hr Total VOC Concentration ($\mu g/m^3$) |
|---|---|
| ENG06 | 163.56883 |
| Group NATGAS | 0.39395 |

| | | ENG06 | | | Group NATGAS | | | Chemical-Specific Modeling | Overall Model Results | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | Group for Modeling | Speciated Emissions (lb/hr) | Emissions as Wt. Frac. Of VOC (-) | Maximum Off-Property Concentration ($\mu g/m^3$) | Speciated Emissions (lb/hr) | Emissions as Wt. Frac. Of VOC (-) | Maximum Off-Property Concentration ($\mu g/m^3$) | Maximum Off-Property Concentration ($\mu g/m^3$) | Cumulative Maximum Off-Property Concentration ($\mu g/m^3$) | ESL ($\mu g/m^3$) | Concentration as % of ESL (%) |
| Fluoranthene | 1-Scaling | 3.28E-05 | 8.63E-06 | 1.41E-03 | 1.36E-06 | 1.45E-06 | 5.72E-07 | | 1.41E-03 | 0.5 | 2.8E-01 |
| Fluorene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.24E-06 | 1.32E-06 | 5.21E-07 | | 5.21E-07 | 10 | 5.2E-06 |
| Formaldehyde | 1-Scaling | 5.09E-03 | 1.34E-03 | 2.19E-01 | 3.32E-02 | 3.55E-02 | 1.40E-02 | | 2.33E-01 | 15 | 1.6E+00 |
| $H_2S$ | 4-H2S, chemical-specific | | | | | | | 0.155 | 1.55E-01 | 108 | 1.4E-01 |
| Hexane (n-) | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.45E-01 | 9.03E-01 | 3.56E-01 | | 3.56E-01 | 5300 | 6.7E-03 |
| Hexanes+ | 5-Hexanes+, chemical-specific | | | | | | | 386 (Routine) 1360 (MSS) | 386 (Routine) 1360 (MSS) | 5300 | 7.3E+0 (Routine), 2.6E+1 (MSS) |
| Indeno(1,2,3-cd)pyrene | 1-Scaling | 1.62E-06 | 4.26E-07 | 6.97E-05 | 8.45E-07 | 9.03E-07 | 3.56E-07 | | 7.01E-05 | 0.5 | 1.4E-02 |
| Manganese | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.72E-04 | 1.84E-04 | 7.24E-05 | | 7.24E-05 | 2 | 3.6E-03 |
| Mercury | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.15E-04 | 1.23E-04 | 4.83E-05 | | 4.83E-05 | 0.1 | 4.8E-02 |
| Naphthalene | 1-Scaling | 3.65E-04 | 9.61E-05 | 1.57E-02 | 2.78E-04 | 2.97E-04 | 1.17E-04 | | 1.58E-02 | 440 | 3.6E-03 |
| Nickel | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.65E-04 | 1.03E-03 | 4.07E-04 | | 4.07E-04 | 0.33 | 1.2E-01 |
| Pentanes | 6-Pentanes,chemical-specific | | | | | | | 73 (Routine), 2574 (MSS) | 73 (Routine), 2574 (MSS) | 4100 | 1.8E+00 (Routine), 6.3E+01 (MSS) |
| Phenanathrene | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.84E-06 | 8.39E-06 | 3.30E-06 | | 3.30E-06 | 0.5 | 6.6E-04 |
| Pyrene | 1-Scaling | 2.06E-05 | 5.42E-06 | 8.87E-04 | 2.26E-06 | 2.42E-06 | 9.53E-07 | | 8.88E-04 | 0.5 | 1.8E-01 |
| Selenium | 1-Scaling | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.12E-05 | 1.19E-05 | 4.70E-06 | | 4.70E-06 | 2 | 2.4E-04 |
| Toluene | 1-Scaling | 1.76E-03 | 4.63E-04 | 7.58E-02 | 1.54E-03 | 1.65E-03 | 6.48E-04 | | 7.64E-02 | 640 | 1.2E-02 |
| Xylenes | 1-Scaling | 1.23E-03 | 3.24E-04 | 5.29E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 5.29E-02 | 350 | 1.5E-02 |

Sample Calculations:

*ENG06 Scaling*

1,3-Butadiene maximum off-property concentration = (163.56883 ug/m3 off-property concentration from VOC) (0.0000445 lb 1,3-butadiene/lb VOC)
= 0.00727 ug/m3

*Cumulative Maximum Off-Property Concentration*

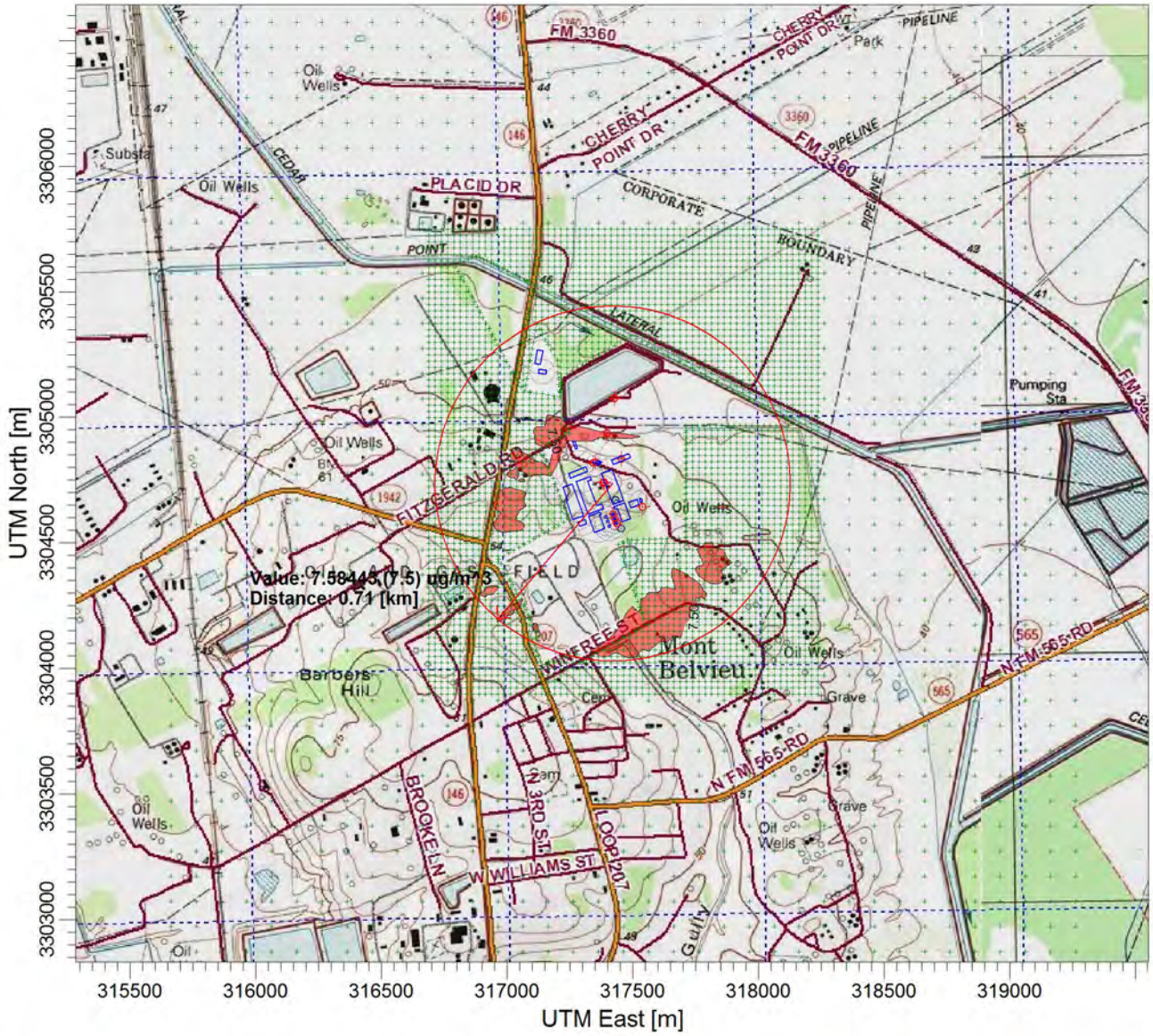
Acenaphthene maximum off-property concentration = (0.000263 ug/m3 off-property concentration from ENG06) + (0.000000356 ug/m3 off-property concentration from natural gas combustion)
= 0.000264 ug/m3

# SECTION 14.0

## MODELING CONCENTRATION PLOTS

PROJECT TITLE:

**ONEOK - MB PLANT**
**1-hr NO2**



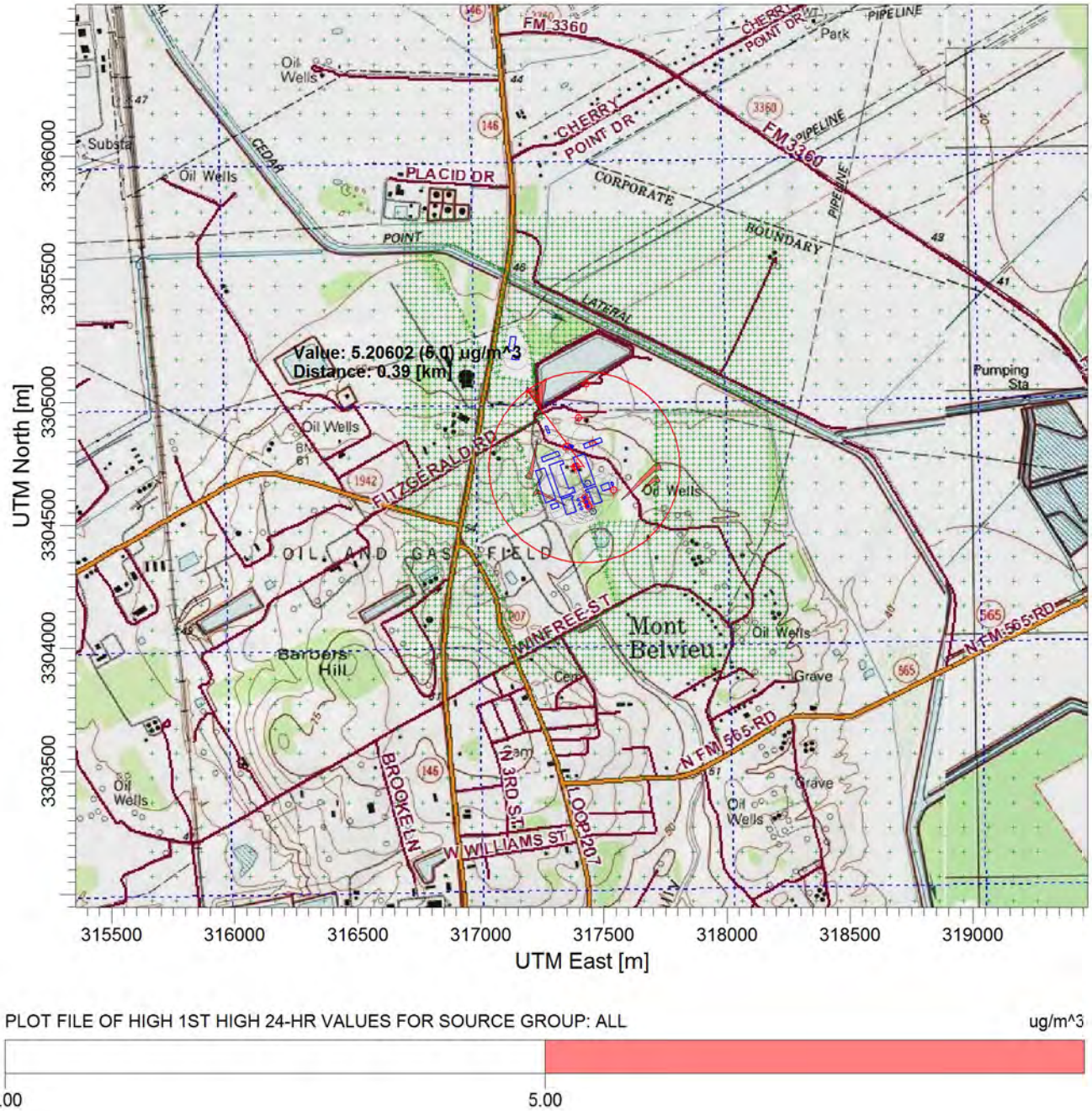

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **14** | COMPANY NAME: | |
| | RECEPTORS: **5082** | MODELER: | |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:26,855 (0 — 1 km) | |
| | MAX: **8.19858 ug/m^3** | DATE: **4/14/2013** | PROJECT NO.: |

AERMOD View - Lakes Environmental Software

C:\Users\miranda\Desktop\ModelingJobs\ONE8354\ONE8354.isc

PROJECT TITLE:

**ONEOK - MB PLANT**
**24-hr PM10**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

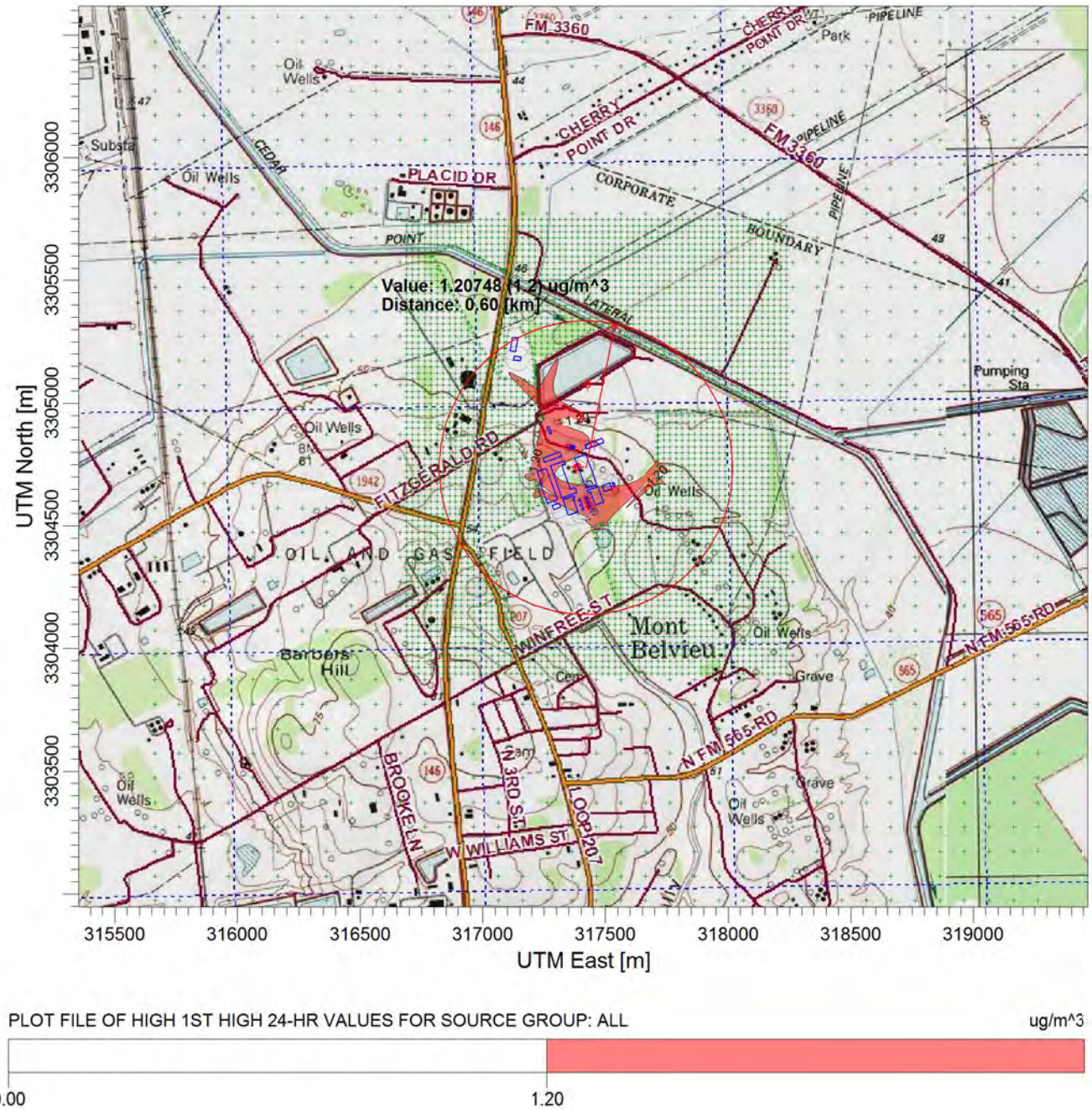
0.00 5.00

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **14** | COMPANY NAME: | |
| | RECEPTORS: **5082** | MODELER: | |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:25,868 0 1 km | |
| | MAX: **5.82461 ug/m^3** | DATE: **4/12/2013** | PROJECT NO.: |

AERMOD View - Lakes Environmental Software C:\Users\miranda\Desktop\ModelingJobs\ONE8354\ONE8354.isc

PROJECT TITLE:

**ONEOK - MB PLANT**
**24-hr PM2.5**




| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **14** | COMPANY NAME: | |
| | RECEPTORS: **5082** | MODELER: | |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:25,868 0 1 km | |
| | MAX: **1.49844 ug/m^3** | DATE: **4/12/2013** | PROJECT NO.: |

AERMOD View - Lakes Environmental Software

C:\Users\miranda\Desktop\ModelingJobs\ONE8354\ONE8354.isc

# 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 EAST | UTM NORTH | HEIGHT | | DIAMETER | | VELOCITY | | TEMPERATURE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (m) | (m) | (ft) | (m) | (ft) | (m) | (ft/sec) | (m/sec) | (° F) | (° K) |
| H-04 | H04 | Hot Oil Heater 4 | 317436 | 3304578 | 146.33 | 44.6 | 8.33 | 2.54 | 25 | 7.62 | 305 | 425 |
| H-05 | H05 | Hot Oil Heater 5 | 317429 | 3304596 | 146.33 | 44.6 | 8.33 | 2.54 | 25 | 7.62 | 305 | 425 |
| H-06 | H06 | Hot Oil Heater 6 | 317422 | 3304614 | 146.33 | 44.6 | 8.33 | 2.54 | 25 | 7.62 | 305 | 425 |
| FL-01 | FL01 | Flare | 317397 | 3304938 | 210 | 64 | 1.22 | 0.372 | 65.6 | 20 | 1832 | 1270 |
| CT-04 | CT04 | Frac-2 Cooling Tower | 317454 | 3304835 | 30 | 9.14 | 12 | 3.66 | 1 | 0.305 | Amb. | 0 |
| T-410-2 | T4102 | Spent Caustic Tank | 317387 | 3304741 | 16.5 | 5.03 | 0.00328 | 0.001 | 0.00328 | 0.001 | Amb. | 0 |
| T-630-2 | T6302 | Wastewater Tank | 317344 | 3304820 | 24.5 | 7.47 | 0.00328 | 0.001 | 0.00328 | 0.001 | Amb. | 0 |
| LOAD-SC | LOADSC | Spent Caustic Loading | 317381 | 3304739 | 12 | 3.66 | 0.00328 | 0.001 | 0.00328 | 0.001 | Amb. | 0 |
| LOAD-WW | LOADWW | Wastewater Loading | 317353 | 3304822 | 12 | 3.66 | 0.00328 | 0.001 | 0.00328 | 0.001 | Amb. | 0 |
| ENG-05 | ENG05 | Frac-2 Emergency Generator | 317538 | 3304645 | 10 | 3.05 | 0.67 | 0.204 | 35 | 10.7 | 500 | 533 |
| ENG-06 | ENG06 | Frac-2 Firewater Pump | 317427 | 3305077 | 10 | 3.05 | 0.67 | 0.204 | 35 | 10.7 | 500 | 533 |

**Flare - Effective Stack Diameter**

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

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

q = 2,500,000 Btu/hr
= 175,000 cal/sec

MW = 18.7 lb/lb-mol

$q_n$ = 138,675 cal/sec

D = 0.372 m

**Flare - Effective Stack Diameter for 1-hr and 8-hr CO Modeling and 1-hr $NO_2$ Modeling**

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

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

q = 609,350,350 Btu/hr
= 42,654,525 cal/sec

MW = 22.8 lb/lb-mol

$q_n$ = 32,878,241 cal/sec

D = 5.73 m

Note: For all pollutants and averaging times except for 1-hr CO, 8-hr CO, and 1-hr $NO_2$, 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-03 | FUG03 | Frac-2 Fugitives | 317438 | 3304578 | 3 | 0.914 | 184 | 56.1 | 678 | 207 | 11600 | -20 |

**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-2 | MSSFUG2 | MSS-Degassing | 317433 | 3304671 | 20 | 6.1 | 30 | 9.14 | 15 | 4.57 | 1.42 | 4.25 | Surface-based, single volume source |
| MSS-FUG-2 | MSSNH3FU | MSS-Degassing (NH3) | 317455 | 3304558 | 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 m side length) / (4.3)
= 1.42 m

SZ-INIT = (9.14 m vertical source dimension) / (2.15)
= 4.25 m

**Modeled Emission Rates for Criteria Pollutant Emission Sources**

| EPN | MODEL ID | DESCRIPTION | 1-hr and 8-hr CO | | 1-hr $NO_2$ | | | Annual $NO_2$ | | | 24-hr $PM_{10}$ | | 24-hr $PM_{2.5}$ | | Annual $PM_{2.5}$ | | 1-hr and 3-hr $SO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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) |
| H-04 | H04 | Hot Oil Heater 4 | 46.1 | 5.8 | 7.68 | 0.8 | 0.77 | 6.26 | 1 | 0.18 | 0.768 | 0.097 | 0.768 | 0.097 | 3.07 | 0.088 | 10.21 | 1.29 |
| H-05 | H05 | Hot Oil Heater 5 | 46.1 | 5.8 | 7.68 | 0.8 | 0.77 | 6.26 | 1 | 0.18 | 0.768 | 0.097 | 0.768 | 0.097 | 3.07 | 0.088 | 0.11 | 0.014 |
| H-06 | H06 | Hot Oil Heater 6 | 46.1 | 5.8 | 7.68 | 0.8 | 0.77 | 6.26 | 1 | 0.18 | 0.768 | 0.097 | 0.768 | 0.097 | 3.07 | 0.088 | 0.11 | 0.014 |
| FL-01 | FL01 | Flare | 337.8 | 43 | 39.76 | 0.8 | 4 | 1.97 | 1 | 0.057 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0018 | 0.00023 |
| CT-04 | CT04 | Frac-2 Cooling Tower | 0 | 0 | 0 | 0.8 | 0 | 0 | 1 | 0 | 0.60 | 0.076 | 0.15 | 0.019 | 0.66 | 0.019 | 0 | 0 |
| ENG-05 | ENG05 | Frac-2 Emergency Generator | 0.77 | 0.097 | 0 | 0.8 | 0 | 0.045 | 1 | 0.0013 | 0.044 | 0.00046 | 0.044 | 0.00046 | 0.0022 | 0.000063 | 0.0016 | 0.0002 |
| ENG-06 | ENG06 | Frac-2 Firewater Pump | 3.3 | 0.42 | 0 | 0.8 | 0 | 0.19 | 1 | 0.0055 | 0.19 | 0.002 | 0.19 | 0.002 | 0.0095 | 0.00027 | 0.0067 | 0.00084 |

Notes: EPNs ENG-05 and ENG-06 are not included in the 1-hr $NO_2$ modeling demonstration because they are emergency engines.
24-hr $PM_{10}$ and 24-hr $PM_{2.5}$ emissions for EPNs ENG-05 and ENG-06 have been adjusted to reflect a maximum of 2 hr/day of operation.

ENG-05, 24-hr $PM_{10}$ =

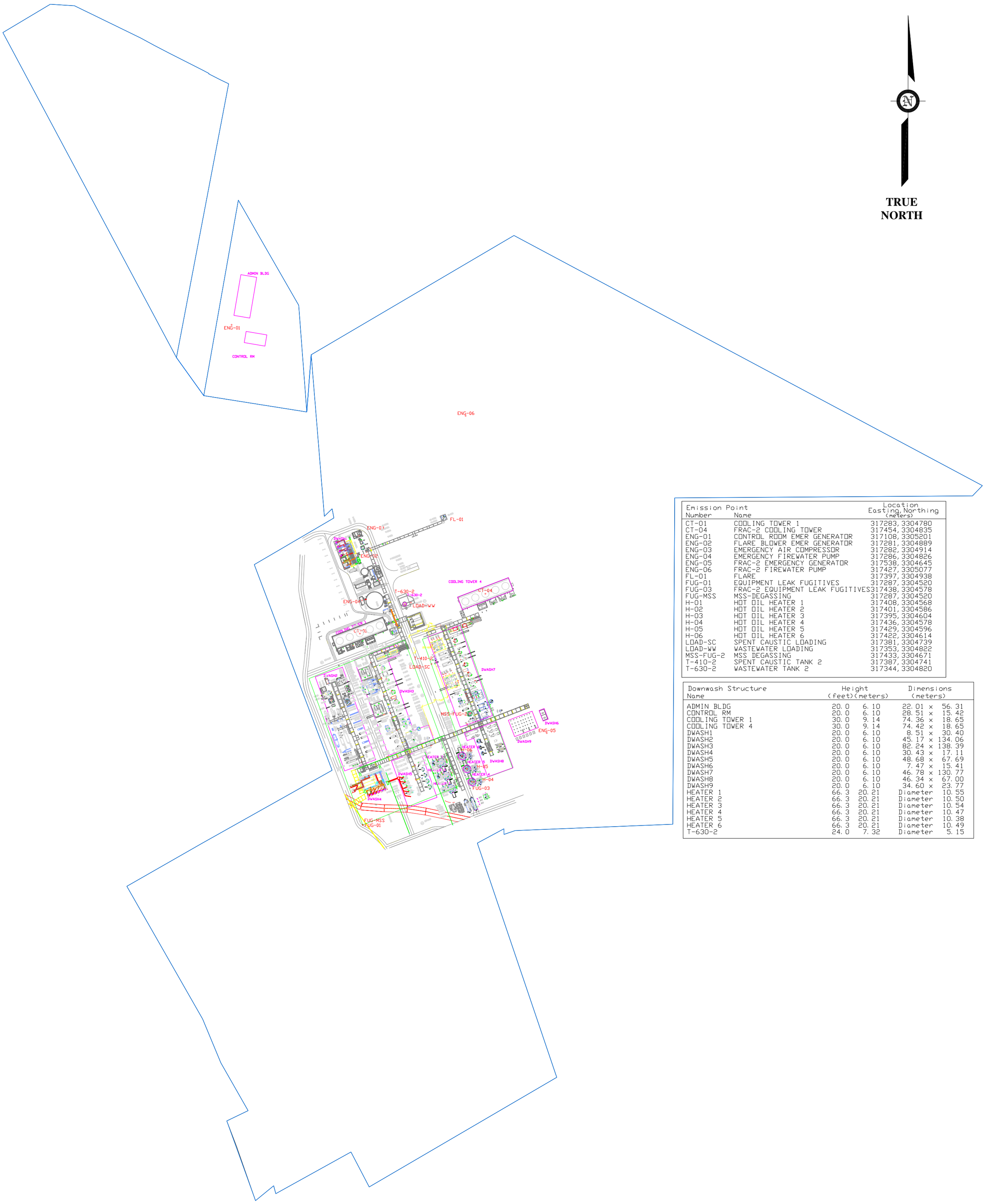
$$\frac{0.044 \text{ lb } PM_{10}}{\text{hr}} \left| \frac{2 \text{ hr operation}}{24 \text{ hr}} \right| \frac{454 \text{ g}}{1 \text{ lb}} \left| \frac{1 \text{ hr}}{3600 \text{ sec}} \right. = 0.00046 \text{ g/sec}$$

**Modeled Emission Rates for Non-Criteria Pollutant Emission Sources**

| FIN | EPN | MODEL ID | DESCRIPTION | Total VOC | | Ammonia | | Butanes | | H2S | | Hexanes+ | | Pentanes | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (lb/hr) | (g/sec) | (lb/hr) | (g/sec) | (lb/hr) | (g/sec) | (lb/hr) | (g/sec) | (lb/hr) | (g/sec) | (lb/hr) | (g/sec) |
| H-04 | H-04 | H04 | Hot Oil Heater 4 | 0.307 | 0.039 | 0.707 | 0.089 | | 0 | | 0 | | 0 | | 0 |
| H-05 | H-05 | H05 | Hot Oil Heater 5 | 0.307 | 0.039 | 0.707 | 0.089 | | 0 | | 0 | | 0 | | 0 |
| H-06 | H-06 | H06 | Hot Oil Heater 6 | 0.307 | 0.039 | 0.707 | 0.089 | | 0 | | 0 | | 0 | | 0 |
| VENTS | H-04 | H04 | Vents to Hot Oil Heaters | | 0 | | 0 | 0.003 | 0.00038 | 0.022 | 0.0028 | 0.048 | 0.0061 | 0.016 | 0.002 |
| FL-01 | FL-01 | FL01 | Flare | 0.014 | 0.0018 | | 0 | | 0 | | 0 | | 0 | | 0 |
| CT-04 | CT-04 | CT04 | Frac-2 Cooling Tower | | 0 | | 0 | 0.74 | 0.093 | | 0 | 0.33 | 0.042 | 0.58 | 0.073 |
| T-410-2 | T-410-2 | T4102 | Spent Caustic Tank | | 0 | | 0 | | 0 | 0.0012 | 0.00015 | 1.2 | 0.15 | | 0 |
| T-630-2 | T-630-2 | T6302 | Wastewater Tank | | 0 | | 0 | | 0 | | 0 | 1.26 | 0.16 | | 0 |
| LOAD-SC | LOAD-SC | LOADSC | Spent Caustic | | 0 | | 0 | | 0 | | 0 | 0.0862 | 0.011 | | 0 |
| LOAD-WW | LOAD-WW | LOADWW | Wastewater Loading | | 0 | | 0 | | 0 | | 0 | 0.0862 | 0.011 | | 0 |
| ENG-05 | ENG-05 | ENG05 | Frac-2 Emergency Generator | 0.89 | 0.11 | | 0 | | 0 | | 0 | | 0 | | 0 |
| ENG-06 | ENG-06 | ENG06 | Frac-2 Firewater Pump | 3.8 | 0.48 | | 0 | | 0 | | 0 | | 0 | | 0 |
| FUG-03 | FUG-03 | FUG03 | Frac-2 Equipment | | 0 | | 0 | 0.236 | 0.03 | 3.32E-06 | 4.2E-07 | 0.0619 | 0.0078 | 0.1276 | 0.016 |
| MSS-FL-2 | FL-01 | FL01 | MSS-Flaring | | 0 | | 0 | 76.6 | 9.7 | | 0 | 21 | 2.6 | 38.2 | 4.8 |
| ATM-MSS-2 | MSS-FUG-2 | MSSFUG2 | MSS-Degassing | | 0 | | 0 | 40.65 | 5.1 | | 0 | 5.89 | 0.74 | 11.05 | 1.4 |
| ATM-MSS-2 | ATM-MSS-2 | MSSNH3FU | MSS-Degassing (NH3) | | 0 | 0.24 | 0.03 | | 0 | | 0 | | 0 | | 0 |

# APPENDIX B

## PLOT PLAN




**TRUE NORTH**

| Emission Point Number | Name | Location Easting, Northing (meters) |
|---|---|---|
| CT-01 | COOLING TOWER 1 | 317283, 3304780 |
| CT-04 | FRAC-2 COOLING TOWER | 317454, 3304835 |
| ENG-01 | CONTROL ROOM EMER GENERATOR | 317108, 3305201 |
| ENG-02 | FLARE BLOWER EMER GENERATOR | 317281, 3304889 |
| ENG-03 | EMERGENCY AIR COMPRESSOR | 317282, 3304914 |
| ENG-04 | EMERGENCY FIREWATER PUMP | 317286, 3304826 |
| ENG-05 | FRAC-2 EMERGENCY GENERATOR | 317538, 3304645 |
| ENG-06 | FRAC-2 FIREWATER PUMP | 317427, 3305077 |
| FL-01 | FLARE | 317397, 3304938 |
| FUG-01 | EQUIPMENT LEAK FUGITIVES | 317287, 3304520 |
| FUG-03 | FRAC-2 EQUIPMENT LEAK FUGITIVES | 317438, 3304578 |
| FUG-MSS | MSS-DEGASSING | 317287, 3304520 |
| H-01 | HOT OIL HEATER 1 | 317408, 3304568 |
| H-02 | HOT OIL HEATER 2 | 317401, 3304586 |
| H-03 | HOT OIL HEATER 3 | 317395, 3304604 |
| H-04 | HOT OIL HEATER 4 | 317436, 3304578 |
| H-05 | HOT OIL HEATER 5 | 317429, 3304596 |
| H-06 | HOT OIL HEATER 6 | 317422, 3304614 |
| LOAD-SC | SPENT CAUSTIC LOADING | 317381, 3304739 |
| LOAD-WW | WASTEWATER LOADING | 317353, 3304822 |
| MSS-FUG-2 | MSS DEGASSING | 317433, 3304671 |
| T-410-2 | SPENT CAUSTIC TANK 2 | 317387, 3304741 |
| T-630-2 | WASTEWATER TANK 2 | 317344, 3304820 |

| Downwash Structure Name | Height (feet) | Height (meters) | Dimensions (meters) |
|---|---|---|---|
| ADMIN BLDG | 20.0 | 6.10 | 22.01 x 56.31 |
| CONTROL RM | 20.0 | 6.10 | 28.51 x 15.42 |
| COOLING TOWER 1 | 30.0 | 9.14 | 74.36 x 18.65 |
| COOLING TOWER 4 | 30.0 | 9.14 | 74.42 x 18.65 |
| DWASH1 | 20.0 | 6.10 | 8.51 x 30.40 |
| DWASH2 | 20.0 | 6.10 | 45.17 x 134.06 |
| DWASH3 | 20.0 | 6.10 | 82.24 x 138.39 |
| DWASH4 | 20.0 | 6.10 | 30.43 x 17.11 |
| DWASH5 | 20.0 | 6.10 | 48.68 x 67.69 |
| DWASH6 | 20.0 | 6.10 | 7.47 x 15.41 |
| DWASH7 | 20.0 | 6.10 | 46.78 x 130.77 |
| DWASH8 | 20.0 | 6.10 | 46.34 x 67.00 |
| DWASH9 | 20.0 | 6.10 | 34.60 x 23.77 |
| HEATER 1 | 66.3 | 20.21 | Diameter 10.55 |
| HEATER 2 | 66.3 | 20.21 | Diameter 10.50 |
| HEATER 3 | 66.3 | 20.21 | Diameter 10.54 |
| HEATER 4 | 66.3 | 20.21 | Diameter 10.47 |
| HEATER 5 | 66.3 | 20.21 | Diameter 10.38 |
| HEATER 6 | 66.3 | 20.21 | Diameter 10.49 |
| T-630-2 | 24.0 | 7.32 | Diameter 5.15 |

0 100 200 400

SCALE IN METERS

WAID ENVIRONMENTAL

**ONEOK HYDROCARBON, L.P.**

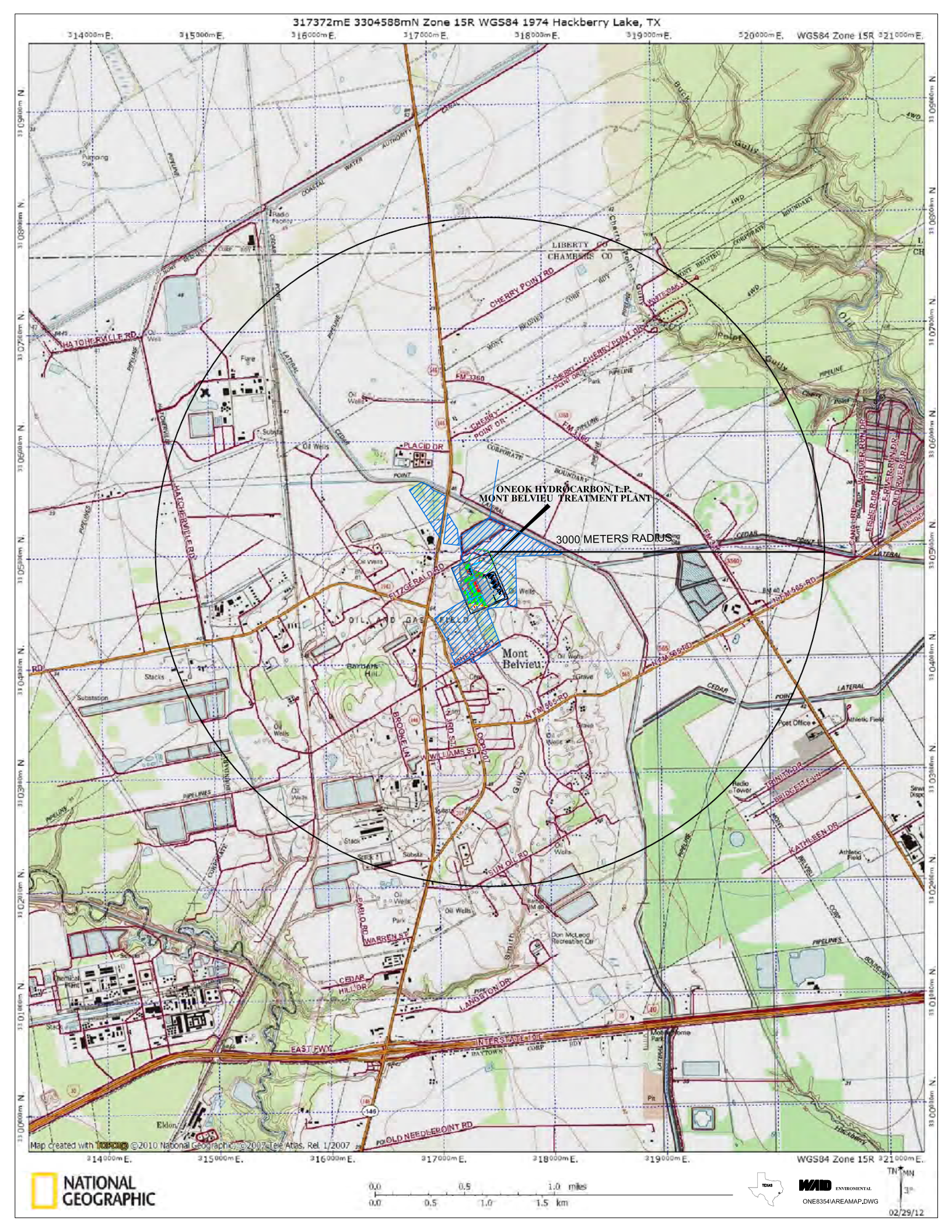
Second Fractionation Train at Mont Belvieu NGL Plant

| Drawn By | Start Date | Rev. Date | DWG Name | Rev. No. |
|---|---|---|---|---|
| DWW | 2/14/11 | 3/29/13 | PLOTPLAN-9 | 23 |

H:\CLIENTS\ONEOK\ONE8354\ACAD

# APPENDIX C

## AREA MAP


317372mE 3304588mN Zone 15R WGS84 1974 Hackberry Lake, TX
WGS84 Zone 15R
ONEOK HYDROCARBON, L.P.
MONT BELVIEU TREATMENT PLANT
3000 METERS RADIUS
Mont Belvieu
CHERRY POINT RD
FITZGERALD RD
PLACID DR
WILLIAMS ST
SUN OIL RD
WARREN ST
CEDAR HILL DR
LANGSTON DR
OLD NEEDLEPOINT RD
EAST FWY
INTERSTATE 10
LIBERTY CO
CHAMBERS CO
Map created with TOPO! ©2010 National Geographic, ©2007 Tele Atlas, Rel. 1/2007
NATIONAL GEOGRAPHIC
WAID ENVIROMENTAL
ONE8354\AREAMAP.DWG
02/29/12

**APPENDIX D - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT NO. TX0140091 AND STATEMENT OF BASIS**

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

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

Prepared by

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

# NPDES PERMIT NO. TX0140091
# STATEMENT OF BASIS

FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

**APPLICANT**:

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

**ISSUING OFFICE**:

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

**PREPARED BY**:

Maria E. Okpala
Environmental Engineer
NPDES Permits Branch (6WQ-PP)
Water Quality Protection Division
Voice: 214-665-3152
Fax: 214-665-2191
Email: okpala.maria@epa.gov

**DATE PREPARED:**

November 29, 2012

**PERMIT ACTION**

It is proposed that the facility be issued an NPDES permit for a 5-year term in accordance with regulations contained in 40 Code of Federal Regulations (CFR) 122.46(a).

40 CFR CITATIONS: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations, revised as of November 2, 2012.

**RECEIVING WATER – BASIN**

Unnamed ditch to Smith Gully to Cedar Bayou Tidal above tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin;

## DOCUMENT ABBREVIATIONS

For brevity, Region 6 used acronyms and abbreviated terminology in this Statement of Basis document whenever possible. The following acronyms were used frequently in this document:

| | |
|---|---|
| BAT | Best Available Technology Economically Achievable) |
| $BOD_5$ | Biochemical oxygen demand (five-day unless noted otherwise) |
| BPJ | Best professional judgment |
| CFR | Code of Federal Regulations |
| cfs | Cubic feet per second |
| COD | Chemical oxygen demand |
| COE | United States Corp of Engineers |
| CWA | Clean Water Act |
| DMR | Discharge monitoring report |
| ELG | Effluent limitation guidelines |
| EPA | United States Environmental Protection Agency |
| ESA | Endangered Species Act |
| F&WS | United States Fish and Wildlife Service |
| GPD | Gallon per day |
| IP | Procedures to Implement the Texas Surface Water Quality Standards |
| µg/l | Micrograms per liter (one part per billion) |
| mg/l | Milligrams per liter (one part per million) |
| Menu 6 | Narrow Tidal Water |
| MGD | Million gallons per day |
| MSGP | Multi-Sector General Permit |
| NPDES | National Pollutant Discharge Elimination System |
| MQL | Minimum quantification level |
| O&G | Oil and grease |
| RRC | Railroad Commission of Texas |
| RP | Reasonable potential |
| SIC | Standard industrial classification |
| s.u. | Standard units (for parameter pH) |
| TAC | Texas Administrative Code |
| TCEQ | Texas Commission on Environmental Quality |
| TDS | Total dissolved solids |
| TMDL | Total maximum daily load |
| TOC | Total Organic Carbon |
| TRC | Total residual chlorine |
| TSS | Total suspended solids |
| TSWQS | Texas Surface Water Quality Standards |
| WET | Whole effluent toxicity |
| WQMP | Water Quality Management Plan |
| WQS | Water Quality Standards |

## I. PROPOSED CHANGES FROM PREVIOUS PERMIT

New discharger

## II. APPLICANT LOCATION and ACTIVITY

Under the SIC Code 1321, the applicant operates a natural gas liquid plant.

As described in the application, the facility is located at 11350 Fitzgerald, Baytown, Chambers County, Texas. The facility processes and fractionates natural gas feedstock into ethane, n-butane, iso-butane, propane and natural gasoline.

Wastewater discharges from the facility are as follows:

Discharges from Outfall 001 consist of stormwater and firewater and eyewash/showers which flow into unnamed ditch to Smith Gully to Cedar Bayou above Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin.

Discharges are located on that water at:

Outfall 001: Latitude 29° 51' 45"N; Longitude 94° 53' 15"W

Discharges from Outfall 002 consist of cooling water blowdown, stormwater, firewater and eyewash/showers which flow into unnamed ditch to Smith Gully to Cedar Bayou above Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin.

Outfall 002: Latitude 29° 51' 15"N; Longitude 94° 53' 30"W

Discharges from internal Outfall 101 consist of water treatment residuals water which flows into Outfall 001.

Outfall 003: Latitude 29° 51' 45"N; Longitude 94° 53' 30"W

## III. PROCESS AND DISCHARGE DESCRIPTION

The facility plans to construct a new natural gas liquids (NGL) fractionation plant which will consist of two fractionation units (MB2 and MB3) and an Ethane/Propane Splitter (E/P splitter) in Mont Belvieu, Texas. The two fractionation units will separate Y-grade NGL into ethane, propane, n-butane, iso-butane, and natural gasoline. The E/P Splitter will take a raw feed and split the liquid into ethane and propane. All the 3 units will discharge water through three Outfalls.

The facility plans to dispose process wastewater off-site. The main sources of non-process wastewater will be water treatment residuals, cooling tower blow-down, firewater, and storm water.

The OHLP plans to treat raw water from the Cedar Point Lateral of the Coastal Water Authority Canal, primarily for removal of silt, vegetation and biological contaminants. In order to pre-treat the raw water for cooling tower make-up and reverse osmosis polishing, the facility plans to construct the following water treatment processes: chemical precipitation, clarification, filtration,

and disinfection. The water will be treated utilizing gravity clarification and filtration process. Water treatment chemicals such as Sodium hypochlorite will be added to maintain a minimum residual chlorine level for biological control during storage. Wastewater discharge from internal Outfall 101 is conveyed via ditch to NPDES Outfall 001.

The treated water will be utilized for fire protection, cooling towers and fractionation process. Cooling tower blow-down will be discharged to Outfall 002. Anti-scalants, corrosion inhibitors, and biocides will be added to the cooling towers to ensure appropriate treatment of the water for operation of the equipment. .

**Table 1: Discharge Characteristics**

The table below shows estimated facility's pollutant concentrations contained in the NPDES application. The data presented below was based on the raw water data and is not a true representation of the facility's effluent characteristics. The facility is required to measure the actual effluent quality upon its discharge.

**Internal Outfall 101:**

| Parameter | Max Concentration, mg/L unless noted | Average Concentration, mg/L unless noted |
|---|---|---|
| Flow, MGD | 0.251 | 0.158 |
| pH, su | 6.5 - 9.0 | 6.5 – 9.0 |
| TSS | 633 | 425 |
| TOC | 117 | 78 |
| COD | 351 | 234 |
| BOD | 32 | 21 |
| Ammonia (as Nitrogen) | 0.3 | 0.2 |
| Temperature, winter | <95 F | <95 F |
| Temperature, summer | <95 F | <95 F |
| Total Residual Chlorine | 1.2 | 1.0 |
| Phosphorus | 7.7 | 5.1 |
| Iron | 126 | 87 |
| Aluminum | 188 | 126 |
| Barium | 0.22 | 0.15 |
| Boron | 11.5 | 7.7 |
| Copper | 0.07 | 0.05 |
| Manganese | 3.0 | 2.0 |
| Titanium, Total | 1.7 | 1.1 |
| Molybdenum | 1.7 | 1.1 |
| Nickel | 0.2 | 0.11 |
| Strontium | 0.24 | 0.16 |
| Vanadium | 0.16 | 0.11 |
| Zinc | 0.03 | 0.02 |

**Outfall 001:**

| Parameter | Max Concentration, mg/L unless noted | Average Concentration, mg/L unless noted |
|---|---|---|
| Flow, MGD | 31.21 | 0.158 |
| pH, su | 6.5 - 9.0 | |
| TSS | 35.6 | 425 |
| TOC | 10.2 | 78 |
| COD | 30.6 | 234 |
| BOD5 | 2.8 | 21 |
| Ammonia (as Nitrogen) | 0.3 | 0.20 |
| Temperature, winter | <95 F | <95 F |
| Temperature, summer | <95 F | <95 F |
| Total Residual Chlorine | 2.8 | 1.0 |
| Phosphorus | 0.9 | 5.1 |
| Iron | 5.8 | 87 |
| Aluminum | 8.7 | 126 |
| Barium | 0.10 | 0.15 |
| Boron | 0.6 | 7.7 |
| Copper | .10 | 0.05 |
| Manganese | 0.2 | 2.0 |
| Molybdenum | 0.10 | 1.1 |
| Nickel | 0.01 | 0.11 |
| Strontium | 0.2 | 0.16 |
| Titanium | 0.10 | 1.1 |
| Vanadium | 0.01 | 0.11 |
| Zinc | 0.03 | 0.02 |

**Outfall 002:**

| Parameter | Max Concentration, mg/L unless noted | Average Concentration, mg/L unless noted |
|---|---|---|
| Flow, MGD | 43.06 | 0.448 |
| pH, su | 6.5 - 9.0 | 6.5-9.0 |
| TSS | 13 | 36 |
| TOC | 9 | 25 |
| COD | 27 | 74 |
| BOD5 | 2.5 | 6.8 |
| Ammonia (as Nitrogen) | 0.5 | 1.4 |
| Temperature, winter | <95 F | <95 F |
| Temperature, summer | <95 F | <95 F |
| Total Residual Chlorine | 3 | 3 |
| Phosphorus | 1.4 | 5.8 |
| Iron | 0.25 | 0.68 |
| Aluminum | 0.52 | 1.4 |
| Barium | 0.16 | 0.45 |
| Boron | 0.21 | 0.57 |

| Parameter | Max Concentration, mg/L unless noted | Average Concentration, mg/L unless noted |
|---|---|---|
| Copper | 0.12 | 0.34 |
| Manganese | 0.03 | 0.07 |
| Titanium, Total | 0.01 | 0.03 |
| Molybdenum | 0.01 | 0.04 |
| Nickel | 0.01 | 0.03 |
| Strontium | 0.4 | 1.1 |
| Vanadium | 0.01 | 0.03 |
| Zinc | 0.05 | 0.14 |

## IV. REGULATORY AUTHORITY/PERMIT ACTION

In November 1972, Congress passed the Federal Water Pollution Control Act establishing the NPDES permit program to control water pollution. These amendments established technology-based or end-of-pipe control mechanisms and an interim goal 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. Further amendments in 1977 of the CWA gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry and established the basic structure for regulating pollutants discharges into the waters of the United States. In addition, it made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. Regulations governing the EPA administered NPDES permit program are generally found at 40 CFR §122 (program requirements & permit conditions), §124 (procedures for decision making), §125 (technology-based standards) and §136 (analytical procedures). Other parts of 40 CFR provide guidance for specific activities and may be used in this document as required.

It is proposed that the permit be issued for a 5-year term following regulations promulgated at 40 CFR 122.46(a). This is a first time permit issuance. An NPDES Application for a Permit to Discharge (Form 2D) was received on September 14, 2012, and was deemed administratively incomplete on October 30, 2012. Additional permit application information was received on November 14, 2012; and the permit application was deemed administratively complete November 15, 2012.

## V. DRAFT PERMIT RATIONALE AND PROPOSED PERMIT CONDITIONS

### A. OVERVIEW of TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITION FOR PERMIT ISSUANCE

Regulations contained in 40 CFR §122.44 NPDES permit limits are developed that meet the more stringent of either technology-based effluent limitation guidelines, numerical and/or narrative water quality standard-based effluent limits, on best professional judgment (BPJ) in the absence of guidelines, and/or requirements pursuant to 40 CFR 122.44(d), whichever are more stringent. Technology-based effluent limitations are established in the proposed draft permit for BOD5. Water quality-based effluent limitations are established in the proposed draft permit for pH and total residual chlorine.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

Regulations promulgated at 40 CFR §122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on ELGs where applicable, on BPJ in the absence of guidelines, or on a combination of the two. In the absence of promulgated guidelines for the discharge, permit conditions may be established using BPJ procedures. EPA establishes limitations based on the following technology-based controls: BPT, BCT, and BAT. These levels of treatment are:

BPT - The first level of technology-based standards generally based on the average of the best existing performance facilities within an industrial category or subcategory.

BCT - Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and O&G.

BAT - The most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. BAT effluent limits represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

The proposed permit establishes limitations and monitoring requirements for BOD5 of 20 mg/l monthly average and 30 mg/l daily maximum. The estimated average flow provided in the application for internal Outfall 101 and Outfall 002 are 0.158 MGD and 0.448 MGD and respectively. The loading limits are calculated as follows:

lbs/day = Concentration of pollutant (mg/l) multiplied by 8.34 multiplied by Flow (MGD)

Internal Outfall 101:
The estimated average flow for Outfall 001 is 0.158 MGD
$BOD_{(5)}$ monthly average: 20 mg/l x 8.34 x 0.158 = 26.35 lbs/day

EPA calculates the daily maximum values by multiplying the daily average by 1.5.

$BOD_{(5)}$ daily maximum: = 39.53 lbs/day

Outfall 002:
$BOD_{(5)}$ monthly average : 20 mg/l x 8.34 x 0.448 MGD = 74.73 lbs/day

EPA calculates the daily maximum values by multiplying the daily average by 1.5.

$BOD_{(5)}$ daily maximum: = 112.09 lbs/day

Stormwater has been identified by the permittee as a component of the discharge through Outfall No. 001 and 002. A requirement to develop a Stormwater Pollution Prevention Plan (SWP3) is proposed in the draft permit. It is proposed that the facility conduct an annual inspection of the facility to identify areas contributing to the storm water discharge and identify potential sources of pollution which may affect the quality of storm water discharges from the facility.

The proposed permit requires the permittee to develop a site map. The site map shall include all areas where storm water may contact potential pollutants or substances which can cause pollution. It is also proposed that all spilled product and other spilled wastes be immediately cleaned up and properly disposed. The permit prohibits the use of any detergents, surfactants or other chemicals from being used to clean up spilled product. Additionally, the permit requires all waste fuel, lubricants, coolants, solvents or other fluids used in the repair or maintenance of vehicles or equipment be recycled or contained for proper disposal. All diked areas surrounding storage tanks or stormwater collection basins shall be free of residual oil or other contaminants so as to prevent the accidental discharge of these materials in the event of flooding, dike failure, or improper draining of the diked area. The permittee shall amend the SWP3 whenever there is a change in the facility or change in operation of the facility.

C. WATER QUALITY BASED LIMITATIONS

1. General Comments

Water quality based requirements are necessary where effluent limits more stringent than technology-based limits are necessary to maintain or achieve federal or state water quality limits. Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on federal or state WQS. Effluent limitations and/or conditions established in the draft permit are in compliance with applicable State WQS and applicable State water quality management plans to assure that surface WQS of the receiving waters are protected and maintained, or attained.

2. Implementation

The NPDES permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the NPDES permits. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

3. State Water Quality Standards

The Clean Water Act in Section 301 (b) requires that effluent limitations for point sources include any limitations necessary to meet water quality standards. Federal regulations found at 40 CFR 122.44(d) state that if a discharge poses the reasonable potential to cause an in-stream excursion above a water quality criterion, the permit must contain an effluent limit for that pollutant. If the discharge poses the reasonable potential to cause an in-stream violation of narrative standards, the permit must contain prohibitions to protect that standard. Additionally, the TWQS found at 30 TAC Chapter 307 states 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 compliance with 30 TAC Chapter 307. Specifically, the methodology is designed to ensure that no source will be allowed to discharge any wastewater which: (1) results in instream 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.

The IP document is not a state water quality standard, but rather, a non-binding, non-regulatory guidance document. See IP at page 2 stating that "this is a guidance document and should not be interpreted as a replacement to the rules. The TWQS may be found in 30 TAC Sections (§§) 307.1-.10."). EPA does not consider the IP to be a new or revised water quality standard and has never approved it as such. EPA did comment on and conditionally "approve" the IP as part of the Continuing Planning Process (CPP) required under 40 CFR §130.5(c) and the Memorandum of Agreement between TCEQ and EPA, but this does not constitute approval of the IP as a water quality standard under CWA section 303(c). Therefore, EPA is not bound by the IP in establishing limits in this permit – but rather, must ensure that the limits are consistent with the EPA-approved state WQS. However, EPA has made an effort, where we believe the IP procedures are consistent with all applicable State and Federal regulations, to use those procedures.

The general criteria and numerical criteria which make up the stream standards are provided in the 2000 EPA-approved Texas Water Quality Standards, Texas Administrative Code (TAC), 30 TAC Sections 307.1 - 307.9, effective August 17, 2000.

The designated uses of Cedar Bayou above Tidal,Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin are contact recreation and high aquatic life.

4. Reasonable Potential- Procedures

EPA develops draft permits to comply with State WQS, and for consistency, attempts to follow the IP where appropriate. However, EPA is bound by the State's WQS, not State guidance, including the IP, in determining permit decisions. EPA performs its own technical and legal review for permit issuance, to assure compliance with all applicable State and Federal requirements, including State WQS, and makes its determination based on that review. Waste load allocations (WLA's) are calculated using estimated effluent dilutions, criteria outlined in the TWQS, and partitioning coefficients for metals (when appropriate and designated in the implementation procedures). The WLA is the end-of-pipe effluent concentrations that can be discharged and still meet instream criteria after mixing with the receiving stream. From the WLA, a long term average (LTA) is calculated, for both chronic and acute toxicity, using a log normal probability distribution, a given coefficient of variation (0.6), and either a 90th or a 99th percentile confidence level. The 90th percentile confidence level is for discharges to rivers, freshwater streams and narrow tidal rivers with upstream flow data, and the 99th percentile confidence level is for the remainder of cases. For facilities that discharge into receiving streams that have human health standards, a separate LTA will be calculated. The implementation procedures for determining the human health LTA use a 99th percentile confidence level, along with a given coefficient of variation (0.6). The lowest of the calculated LTA; acute, chronic and/or human health, is used to calculate the daily average and daily maximum permit limits. Procedures found in the IP for determining significant potential are to compare the reported analytical data either from the DMR history and/or the application information, against percentages of the calculated daily average water quality-based effluent limitation. If the average of the effluent data equals or exceeds 70% but is less than 85% of the calculated daily average limit, monitoring for the toxic pollutant will usually be included as a condition in the permit. If the average of the effluent data is equal to or greater than 85% of the calculated daily average limit, the permit will generally contain effluent limits for the toxic pollutant. The permit may specify a compliance period to achieve this limit if necessary.

Procedures found in the IP require review of the immediate receiving stream and effected downstream receiving waters. Further, if the discharge reaches a perennial stream or an intermittent stream with perennial pools within three-miles, chronic toxicity criteria apply at that confluence.

5. Permit-Action - Water Quality-Based Limits

Regulations promulgated at 40 CFR §122.44(d) require limits in addition to, or more stringent than effluent limitation guidelines (technology based). State WQS that are more stringent than effluent limitation guidelines are as follows:

a. pH

Wastewater discharges from the facility flow into Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity-San Jacinto Coastal Basin. The designated uses of Segment 0901, Cedar Bayou Tidal are contact recreation and high aquatic life. The instream pH standards for the Cedar Bayou Tidal, waterbody Segment 0901 is in the range of 6.5 to 9.0 su's. The current permit established pH limits of 6.5 - 9 at all Outfalls

b. Narrative Limitations

Narrative protection for aesthetic standards will propose that surface waters shall be maintained so that oil, grease, or related residue will not produce a visible film or globules of grease on the surface or coat the banks or bottoms of the watercourse; or cause toxicity to man, aquatic life, or terrestrial life.

The following narrative limitations in the proposed permit represent protection of water quality for all Outfalls:

"The effluent shall contain no visible film of oil or globules of grease on the surface or coat the banks or bottoms of the watercourse."

c. Toxics

The CWA in Section 301 (b) requires that effluent limitations for point sources include any limitations necessary to meet water quality standards. Federal regulations found at 40 CFR §122.44 (d) state that if a discharge poses the reasonable potential to cause an in-stream excursion above a water quality criteria, the permit must contain an effluent limit for that pollutant.

The discharges via Outfall 001 enter into unnamed ditch (2.9 miles) to Smith Gully and then to Cedar Bayou Tidal, Segment 0901 of the Trinity- San Jacinto Coastal Basin. The segment specific values for Cedar Bayou Tidal, Segment 0901 are TSS of18 mg/l, hardness is 1700 mg/l, pH is 7.5 s.u., and chloride is 2570 mg/l. TCEQ'S TEXTOX Menu 10 – intermittent freshwater stream within 3 miles of a bay or estuary or tidal water body with no upstream flow information is appropriate for evaluating the discharge. The critical low flow, 7Q2 for Segment 0901, Cedar Bayou above Tidal is 0.0 cfs, while the harmonic mean is 8.0 cfs (0.11 cfs Adjusted for Upstream Discharge of Outfall 002).

For Outfall 001, critical dilutions are as follows based on the assumption of a 3 foot diameter pipe, 200ft Mixing Zone, 50ft Zone of Initial Dilution, and 400ft Human Health Criteria: mixing zone(MZ) is 8%; Zone of initial dilution (ZID) is 30%; and Human health (HH) is 4%.

For Outfall 002, receiving water is unnamed ditch to Smith Gully to Cedar Bayou Tidal (2.9 miles) (Segment ID 0901). TCEQ'S TEXTOX Menu 9 - discharge to an intermittent water body within 3 miles of a tidal water body (< 400 ft) with upstream flow information is appropriate for evaluating the discharge. The critical low flow, 7Q2 for Segment 0901, Cedar Bayou above Tidal is 0.7 cfs, while the harmonic mean is 10.5 cfs (2.8 cfs Adjusted for Upstream Discharges on Cedar Bayou). Critical dilutions are as follows: mixing zone(MZ) is 8%; Zone of initial dilution (ZID) is 30%; and Human health (HH) is 4%.

Information contained in the permit application shows Total Residual Chlorine would be present in discharges through all the Outfalls. The Minimum Quantification level (MQL) for TRC is proposed in the permit as the TRC limit. The MQL for TRC is 33 ug/l. . The effluent shall contain NO MEASURABLE total residual chlorine (TRC) at any time. NO MEASURABLE will be defined as no detectable concentration of TRC as determined by any approved method established in 40 CFR 136. The proposed permit also includes a one-year compliance schedule for total residual chlorine.

Although the facility has not had any actual discharges, it submitted information in its application that would describe the nature of the discharge. A review of the effluent characteristics contained in the permit application is not a true representation of the facility's discharges. As a result, no water quality modeling will be performed at this time. However, should any discharge occur, the discharge shall be sampled within one hour of beginning of the discharge for the pollutants listed at 40 CFR 122, Appendix D, Tables III and IV, plus 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. The reasonable potential calculations shall be performed and the permit re-opened following EPA's receipt of its effluent characteristics.

Solids and Foam

The prohibition of the discharge of floating solids or visible foam in other than trace amounts is established in the proposed permit. In addition, 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.

D. MONITORING FREQUENCY FOR LIMITED PARAMETERS

Regulations require permits to establish monitoring requirements to yield data representative of the monitored activity, 40 CFR §122.48(b), and to assure compliance with permit limitations, 40 CFR §122.44(i)(1). The monitoring frequencies are based on BPJ, taking into account the nature of the facility, the previous permit, and past compliance history.

For all Outfalls, flow shall be monitored daily, when discharging, using a recording flow meter. For internal Outfall 101 and Outfall 002, $BOD_5$ shall be measured and reported daily, when discharging, using grab sample. For Outfalls 001 and 002, pH shall also be measured and reported daily when discharging, using grab sample. TRC shall be measured daily when discharging at all Outfalls

E. WHOLE EFFLUENT TOXICITY LIMITATIONS

Biomonioring is the most direct measure of potential toxicity which incorporates both the effects of synergism of effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity.

OUTFALL 101

In Section V.C.4.c above; it was stated that the critical dilution, CD, for the facility is 8% (including a mixing zone). Based on the nature of the discharge; industrial, the estimated average flow; 0.16 MGD, the nature of the receiving water; intermittent water body within three miles of a bay, estuary or tidal water body; and the critical dilution; 8%, the 2003 TCEQ IP directs the WET test to be a 7 day chronic test using marine test species *Mysidopsis bahia* and *Menidia beryllina* at a quarterly frequency for the first year of the permit. If all WET tests pass during the first year, the permittee may request a monitoring frequency reduction for the either or both of the test species for the following 2-5 years of the permit. The invertebrate species (*Mysidopsis bahia*) may be reduced to twice per year and the vertebrate species (*Menidia beryllina*) may be reduced to once per year. If any tests fail during that time the frequency will revert back to the once per three months frequency for the remainder of the permit term. The both test species shall resume monitoring at a quarterly frequency on the last day of the permit.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 3%, 5%, 6%, 8%, and 11%.

This is a first time issued permit so no DMR reports are available. EPA concludes based on the nature of the discharge described in activity section of this document that this effluent will not cause or contribute to an exceedance of the State water quality standards. Therefore WET limits will not be established in the proposed permit.

During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee is authorized to discharge from Outfall 101 - the discharge to unnamed tributary of Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin after some commingling with storm water. Discharges shall be limited and monitored by the permittee as specified below:

| EFFLUENT CHARACTERISTIC | DISCHARGE MONITORING | |
|---|---|---|
| | 30-DAY AVG MINIMUM | 7-DAY MINIMUM |
| Whole Effluent Toxicity Testing (7 Day Static Renewal) 1/ | | |
| *Mysidopsis bahia* | REPORT | REPORT |
| *Menidia beryllina* | REPORT | REPORT |

| EFFLUENT CHARACTERISTIC | MONITORING REQUIREMENTS | |
|---|---|---|
| | FREQUENCY | TYPE |
| Whole Effluent Toxicity Testing (7 Day Static Renewal) 1/ | | |
| *Mysidopsis bahia* | 1/Quarter | 24-Hr. Composite |
| *Menidia beryllina* | 1/Quarter | 24-Hr. Composite |

FOOTNOTES

1/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.

OUTFALL 002

In Section V.C.4.c. above; "Critical Conditions", it was also stated that the critical dilution, CD, for the facility is 8% (including a mixing zone). Based on the nature of the discharge; industrial, the estimated average flow; 0.45 MGD, the nature of the receiving water; intermittent water body within 3 miles of a tidal water body (< 400 ft) with upstream flow; and the critical dilution; 8%, the 2003 TCEQ IP directs the WET test to be a 7 day chronic test using marine test species *Mysidopsis bahia* and *Menidia beryllina* at a quarterly frequency for the first year of the permit. If all WET tests pass during the first year, the permittee may request a monitoring frequency reduction for the either or both of the test species for the following 2-5 years of the permit. The invertebrate species (*Mysidopsis bahia*) may be reduced to twice per year and the vertebrate species (*Menidia beryllina*) may be reduced to once per year. If any tests fail during that time the frequency will revert back to the once per three months frequency for the remainder of the permit term. Then both test species shall resume monitoring at a quarterly frequency on the last day of the permit.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 3%, 5%, 6%, 8%, and 11%.

This is a first time issued permit so no DMR reports are available. EPA concludes based on the nature of the discharge described in activity section of this document that this effluent will not cause or contribute to an exceedance of the State water quality standards. Therefore WET limits will not be established in the proposed permit.

During the period beginning the effective date of the permit and lasting through the expiration date of the permit, the permittee is authorized to discharge from Outfall 002 - the discharge to an unnamed ditch to Smith Gully to Cedar Bayou above Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. Discharges shall be limited and monitored by the permittee as specified below:

| EFFLUENT CHARACTERISTIC | DISCHARGE MONITORING | |
|---|---|---|
| | 30-DAY AVG MINIMUM | 7-DAY MINIMUM |
| Whole Effluent Toxicity Testing (7 Day Static Renewal) 1/ | | |
| *Mysidopsis bahia* | REPORT | REPORT |
| *Menidia beryllina* | REPORT | REPORT |

| EFFLUENT CHARACTERISTIC | MONITORING REQUIREMENTS | |
|---|---|---|
| | FREQUENCY | TYPE |
| Whole Effluent Toxicity Testing (7 Day Static Renewal) 1/ | | |
| *Mysidopsis bahia* | 1/Quarter | 24-Hr. Composite |
| *Menidia beryllina* | 1/Quarter | 24-Hr. Composite |

FOOTNOTES

1/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.

### F. FINAL EFFLUENT LIMITATIONS

See the draft permit for limitations.

## VI. FACILITY OPERATIONAL PRACTICES

A. WASTE WATER POLLUTION PREVENTION REQUIREMENTS

The permittee shall institute programs directed towards pollution prevention. The permittee will institute programs to improve the operating efficiency and extend the useful life of the treatment system.

B. OPERATION AND REPORTING

The permittee must submit Discharge Monitoring Report's (DMR's) quarterly, beginning on the effective date of the permit, lasting through the expiration date of the permit or termination of the permit, to report on all limitations and monitoring requirements in the permit.

## VII. IMPAIRED WATER - 303(d) LIST AND TMDL

Wastewater discharges from the facility flows into Cedar Bayou Tidal in Waterbody Segment Code No. 0901 of the Trinity – San Jacinto Coastal Basin. The receiving stream is listed as impaired for bacteria (Category 5c), dioxin in edible tissue (Category 5a), and 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 implies that a TMDL is underway, scheduled, or will be scheduled while Category 5c implies that additional data and information will be collected before a TMDL is scheduled. The facility does not discharge bacteria, dioxin and PCBs. If the waterbody is listed at a later date for additional pollutants, and a total maximum discharge loading determined for the segment, the standard reopener clause would allow the permit to be revised and additional pollutants and/or limits added. No additional requirements beyond the already proposed technology-based and/or water-quality based requirements are needed in the proposed permit.

## VIII. ANTIDEGRADATION

The Texas Commission on Environmental Quality, Texas Surface Water Quality Standards, Antidegradation, Title 30, Part 1, Chapter 307, Rule §307.5 sets forth the requirements to protect designated uses through implementation of the State WQS. The limitations and monitoring requirements set forth in the proposed permit are developed from the State WQS and are protective of those designated uses. Furthermore, the policy sets forth the intent to protect the existing quality of those waters, whose quality exceeds their designated use. The permit requirements are protective of the assimilative capacity of the receiving waters, which is protective of the designated uses of that water.

## IX. ANTIBACKSLIDING

The proposed permit is consistent with the requirements and exemption to meet Antibacksliding provisions of the Clean Water Act, Section 402(o) and 40 CFR Part 122.44(i)(B), which state in part that interim or final effluent limitations must be as stringent as those in the previous permit, unless information is available which was not available at the time of permit issuance. This is a first-time permit issuance.

## X. ENDANGERED SPECIES

According to the most recent county listing available at US Fish and Wildlife Service (USFWS), Southwest Region 2 website, http://www.fws.gov/southwest/es/ES_Lists_Main.cfm, seven species in Chambers County are listed as Endangered or Threatened. The listed species are the Green sea turtle *Chelonia mydas*, the Hawksbill sea turtle *Eretmochelys imbricata*, Kemp's ridley sea turtle *Lepidochelys kempii*, Leatherback sea turtle *Dermochelys coriacea*, Loggerhead sea turtle *Caretta caretta,* brown pelican *Pelecanus occidentalis,* and the Piping Plover *Charadrius melodus*.

Available information from the U.S. Southwest Region Ecological Services web page presents the occurrence of the listed threatened and endangered species in Chambers County as follows:

**GREEN SEA TURTLE (Chelonia mydas)**
Sea turtles are graceful saltwater reptiles, well adapted to life in their marine world. With streamlined bodies and flipper-like limbs, they are graceful swimmers able to navigate across the oceans. When they are active, sea turtles must swim to the ocean surface to breathe every few minutes. When they are resting, they can remain underwater for much longer periods of time. Although sea turtles live most of their lives in the ocean, adult females must return to land in order to lay their eggs. Sea turtles often travel long distances from their feeding grounds to their nesting beaches. Human threats include: oil spills, live bottom smothering with sediments and drilling fluids, dredging, coastal development, agricultural and industrial pollution, seagrass bed degradation, shrimp trawling and other fisheries, boat collisions, under water explosions, ingestion of marine debris, entanglement in marine debris, and poaching.

**HAWKSBILL SEA TURTLE (Eretmochelys imbricata)**
The hawksbill is a small to medium-sized sea turtle averaging approximately 2.8 feet in curved carapace length with a weight of approximately 176 pounds. Hawksbills reenter coastal waters when they reach approximately 20-25 cm carapace length. Coral reefs are widely recognized as the resident foraging habitat of juveniles, subadults and adults. This habitat association is undoubtedly related to their diet of sponges, which need solid substrate for attachment. The ledges and caves of the reef provide shelter for resting both during the day and night. Hawksbills are also found around rocky outcrops and high energy shoals, which are also optimum sites for sponge growth. Hawksbills are also known to inhabit mangrove-fringed bays and estuaries, particularly along the eastern shore of continents where coral reefs are absent. In Texas, juvenile hawksbills are associated with stone jetties. Hawksbills utilize both low- and high-energy nesting beaches in tropical oceans of the world. Both insular and mainland nesting sites are known. Hawksbills will nest on small pocket beaches, and, because of their small body size and great agility, can traverse fringing reefs that limit access by other species. They exhibit a wide tolerance for nesting substrate type. Nests are typically placed under vegetation. Threats to this species include: poaching, oil spills, vessel anchoring and groundings, artificial lighting at nesting sites, mechanical beach cleaning, increased human presence, beach vehicular driving, entanglement at sea, ingestion of marine debris, commercial and recreational fisheries, water craft collisions, sedimentation and siltation, and agricultural and industrial pollution.

**KEMP'S RIDLEY SEA TURTLE (Lepidochelys kempii)**
The Kemp's ridley sea turtles are the smallest of all extant sea turtles. Adult Kemp's ridleys' shells are almost as wide as long. Neonatal Kemp's ridleys feed on the available sargassum and associated infauna or other epipelagic species found in the Gulf of Mexico. In post-pelagic stages, the ridley is largely a crab-eater, with a preference for portunid crabs. Age at sexual maturity is not known, but is believed to be approximately 7-15 years, although other estimates of age at maturity range as high as 35 years. The major nesting beach for Kemp's ridleys is on the northeastern coast of Mexico. This location is near Rancho Nuevo in southern Tamaulipas. The species occurs mainly in coastal areas of the Gulf of Mexico and the northwestern Atlantic Ocean. Hunting of both turtles and eggs contributed to the decline of this species. Existing threats include: development and human encroachment of nesting beaches, erosion of beaches, vehicular traffic on beaches, fisheries, oil spills, floating debris, dredging, and explosive removal of old oil and gas platforms.

**LEATHERBACK SEA TURTLE (Dermochelys coriacea)**
The leatherback is the largest living turtle, and is so distinctive as to be placed in a separate taxonomic family, Dermochelyidae. The carapace is distinguished by a rubber-like texture, about 4 cm thick, and made primarily of tough, oil-saturated connective tissue. No sharp angle is

formed between the carapace and the plastron, resulting in the animal being somewhat barrel-shaped. The front flippers are proportionally longer than in any other sea turtle. Nesting occurs from February - July with sites located from Georgia to the U.S. Virgin Islands. During the summer, leatherbacks tend to be found along the east coast of the U.S. from the Gulf of Maine south to the middle of Florida.

Leatherbacks become entangled in longlines, fish traps, buoy anchor lines and other ropes and cables. This can lead to serious injuries and/or death by drowning. Leatherback turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and plastic pellets. Effects of consumption include interference in metabolism or gut function, even at low levels of ingestion, as well as absorption of toxic byproducts. Leatherbacks are vulnerable to boat collisions and strikes, particularly when in waters near shore. Marine turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected.

**LOGGERHEAD SEA TURTLE (Caretta caretta)**
Loggerheads are the most abundant species in U.S. coastal waters, and are often captured incidental to shrimp trawling. Shrimping is thought to have played a significant role in the population declines observed for the loggerhead. Maturity is reached at between 16-40 years. Mating takes place in late March-early June, and eggs are laid throughout the summer. Loggerheads are circumglobal, inhabiting continental shelves, bays, estuaries, and lagoons in temperate, subtropical, and tropical waters. In the United States, killing of nesting loggerheads is infrequent. However, in a number of areas, egg poaching is common. Erosion of nesting beaches can result in loss of nesting habitat. Loggerhead turtles eat a wide variety of marine debris such as plastic bags, plastic and styrofoam pieces, tar balls, balloons and raw plastic pellets. Effects of consumption include interference in metabolism or gut function, even at low levels of ingestion, as well as absorption of toxic byproducts. Turtles are taken by gillnet fisheries in the Atlantic and Gulf of Mexico. Several thousand vessels are involved in hook and line fishing for various coastal species. Sea turtles are at risk when encountering an oil spill. Respiration, skin, blood chemistry and salt gland functions are affected. Pesticides, heavy metals and PCB's have been detected in turtles and eggs, but the effect on them is unknown. Turtles have been caught in saltwater intake systems of coastal power plants. The mortality rate is estimated at 2%. Underwater explosions can kill or injure turtles, and may destroy or damage habitat. The effects of offshore lights are not known. They may attract hatchlings and interfere with proper offshore orientation, increasing the risk from predators. Turtles get caught in discarded fishing gear. The number affected is unknown, but potentially significant.

**PIPING PLOVER (Charadrius melodus)**
A small plover has wings approximately 117 mm; tail 51 mm; weight 46-64 g (average 55 g); length averages about 17-18 cm. Inland birds have more complete breast band than Atlantic coast birds. The nonbreeding plovers lose the dark bands. In Laguna Madre, Texas, non-breeding home ranges were larger in winter than in fall or spring. The breeding season begins when the adults reach the breeding grounds in mid- to late-April or in mid-May in northern parts of the range. The adult males arrive earliest, select beach habitats, and defend established territories against other males. When adult females arrive at the breeding grounds several weeks later, the males conduct elaborate courtship rituals including aerial displays of circles and figure eights, whistling song, posturing with spread tail and wings, and rapid drumming of feet. The plovers defend territory during breeding season and at some winter sites. Nesting territory may or may not contain the foraging area. Home range during the breeding season generally is confined to the vicinity of the nest. Plovers are usually found in sandy

beaches, especially where scattered grass tufts are present, and sparsely vegetated shores and islands of shallow lakes, ponds, rivers, and impoundments.

Food consists of worms, fly larvae, beetles, crustaceans, mollusks, and other invertebrates. The plovers prefer open shoreline areas, and vegetated beaches are avoided. It also eats various small invertebrates. It obtains food from surface of substrate, or occasionally probes into sand or mud. Strong threats related primarily to human activity; disturbance by humans, predation, and development pressure are pervasive threats along the Atlantic coast.

**BROWN PELICAN(*Pelecanus occidentalis)***

On November 17, 2009, brown pelican *Pelecanus occidentalis* was removed from the federal list of threatened and endangered species due to recovery (74 FR 59444 59472). After nearly disappearing from most of the United States decades ago, brown pelican is now flourishing across the nation and no longer needs the protection of the Endangered Species Act.

**Potential Effects of Discharges Authorized by this Permit Renewal**

Many of the threats to listed threatened or endangered turtle species are related to activities in coastal areas and will not be affected by the proposed discharges. Those 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, seagrass bed degradation, and agricultural pollution. Other threats which may occur in the area covered under the proposed permit, which are not related to the proposed discharges are: entanglement at sea, commercial and recreational fisheries, and shrimp trawling. The discharges proposed to be authorized by the permit renewal will not affect those threats to threatened or endangered turtle species.

Threats to species which could be related to Natural Gas Liquids in the area covered under the proposed permit include: oil spill, industrial pollution, and boat collisions. Of those potential threats, only oil spill is directly relevant to the proposed discharges. The proposed permit contains controls to limit the quantity of pollutants which are discharged and prevent toxic effects in the receiving waters. The proposed permit has limits for Biochemical Oxygen Demand, total residual chlorine and pH. The proposed permit is written to include limitations and monitoring requirements on those parameters as a permit conditions.

**Determination**

EPA is unaware, at this time, of any service concerns regarding this discharge and believes the limitations proposed in this permit are adequate to protect the listed species for Chambers County.

Based on information described above, EPA Region 6 has determined that discharges proposed to be authorized by the proposed permit will have no effect on the listed species in Chambers County.

The standard reopener clause in the permit will allow EPA to reopen the permit and impose additional limitations if it is determined that changes in species or knowledge of the discharge would require different permit conditions.

## XI. HISTORICAL AND ARCHEOLOGICAL PRESERVATION CONSIDERATIONS

The issuance of the permit should have no impact on historical and/or archeological preservation. Although construction activities are planned in the issuance, there are no historical and archeological preservation nearby or the facility believes that its construction activities will not be impacted by any known historical and archeological preservation.

## XII. PERMIT REOPENER

The permit may be reopened and modified during the life of the permit if relevant portions of the Texas WQS are revised or remanded. In addition, the permit may be reopened and modified during the life of the permit if relevant procedures implementing the WQS are either revised or promulgated. Should the State adopt a new WQS, and/or develop a TMDL, this permit may be reopened to establish effluent limitations for the parameter(s) to be consistent with that approved State standard and/or water quality management plan, in accordance with 40 CFR §122.44(d). Modification of the permit is subject to the provisions of 40 CFR §124.5.

## XIII. VARIANCE REQUESTS

No variance requests have been received.

## XIV. COMPLIANCE HISTORY

This is a first-time permit issuance.

## XV. CERTIFICATION

This permit is in the process of certification by the State agency following regulations promulgated at 40 CFR 124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service prior to the publication of that notice.

## XVI. FINAL DETERMINATION

The public notice describes the procedures for the formulation of final determinations.

## XVII. ADMINISTRATIVE RECORD

The following information was used to develop the proposed permit:

A. APPLICATION

NPDES Application for Permit to Discharge, Form 1 & 2D, received on September 14, 2012, and was deemed administratively incomplete on October 30, 2012. Additional permit application information was received on November 14, 2012; and was deemed administratively complete November 15, 2012.

B. State of Texas References

The State of Texas Water Quality Inventory, 13th Edition, Publication No. SFR-50, Texas Commission on Environmental Quality, December 1996.

"Procedures to Implement the Texas Surface Water Quality Standards via Permitting," Texas Commission on Environmental Quality, January 2003.
Texas Surface Water Quality Standards, 30 TAC Sections 307.1 - 307.9, effective August 17, 2000.

http://www.fws.gov/southwest/es/ES_Lists_Main.cfm

C. 40 CFR CITATIONS

Sections 122, 124, 125, 133, and 136

D. MISCELLANEOUS CORRESPONDENCE

Letter from Dorothy Brown, EPA, to Mr Scott Schingen, VP NGL Fractionation and Storage, dated October 30, 2012, informing applicant that its NPDES application received April 30, 2012, is administratively incomplete.

Letter from Dorothy Brown, EPA, to Mr Brian Gibson, Plant Manager, dated November 15, 2012, informing applicant that its NPDES application received September 14, 2012, is administratively complete.

Email from Robert Kirkland, EPA, to Maria Okpala, EPA, dated November 13 & 20, 2012, on critical conditions information

# APPENDIX E - MATERIAL SAFETY DATA SHEETS FOR WATER TREAMENT AND COOLING WATER CHEMICALS

GE
Water & Process Technologies

# Material Safety Data Sheet

Issue Date: 27-MAY-2011
Supercedes: 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.

**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<br>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 |

GE
Water & Process Technologies

# 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<br>Irritant (eyes) | * |
| 7664-38-2 | PHOSPHORIC ACID<br>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 |

GE
Water & Process Technologies

# 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.

**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<br>Potential irritant | 10-20 |
| NOT ASSIGNED | DICHLOROTOLYLTRIAZOLE<br>Potential irritant | 3-7 |
| 64665-57-2 | BENZOTRIAZOLE,METHYL,SODIUM SALT (SODIUM TOLYLTRIAZOLE),(TTA)<br>Corrosive (eyes and skin); toxic (by ingestion) | 1-5 |
| 1310-73-2 | SODIUM HYDROXIDE<br>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(Gammerus pseutolimnaeus) 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 |

GE
Water & Process Technologies

# 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.

**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<br>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 |

GE
Water & Process Technologies

# Material Safety Data Sheet

Issue Date: 21-JUN-2011
Supercedes: 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.

**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<br>Toxic (by ingestion); irritant (eyes); potential sensitizer (skin) | 5-10 |
| 10377-60-3 | MAGNESIUM NITRATE<br>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<br>Corrosive (eyes and skin); sensitizer | 1-5 |
| 7786-30-3 | MAGNESIUM CHLORIDE<br>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 |

GE
Water & Process Technologies

# Material Safety Data Sheet

Issue Date: 06-OCT-2011
Supercedes: 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:**

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<br>Combustible liquid; irritant; CNS depressant; IARC=3 (carcinogen status not classifiable) | 15-40 |
| 68002-97-1 | ALCOHOLS,C10-C16,ETHOXYLATED<br>Slight Irritant (eyes and skin) | 1-5 |
| 68551-12-2 | ALCOHOLS,C12-16,ETHOXYLATED<br>Severe irritant (eyes); moderate irritant (skin) | 1-5 |
| 68439-50-9 | ALCOHOLS,C12-14,ETHOXYLATED<br>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 |

GE
Water & Process Technologies

# Material Safety Data Sheet

Issue Date: 16-SEP-2011
Supercedes: 07-APR-2011

KLARAID PC1192

## 1 Identification

**Identification of substance or preparation**
KLARAID 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.

**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<br>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 |

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
Phone: 816-333-9400
Fax: 816-333-3690
www.burnsmcd.com



**Burns & McDonnell: Making our clients successful for more than 100 years**