LAKE CHARLES CRACKER PROJECT (LCCP)  
&  
GAS-TO-LIQUIDS PROJECT (GTL)  

Rezoning Application  

APRIL 2014  

PREPARED FOR:  
CALCASIEU PARISH POLICE JURY  

PREPARED BY:  
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1.0 INTRODUCTION

Sasol North America Inc. (Sasol) plans to make a significant investment in Southwest, Louisiana, with the proposed construction of a world-scale ethane cracker and derivatives complex as well as a gas-to-liquids facility at its Westlake site. This innovative complex will not only benefit our nation’s energy security, but will also be a tremendous economic stimulus to this region.

To begin construction on this project, Sasol is requesting the rezoning of purchased property within its site plan. This application has been prepared to summarize the economic, traffic, drainage, and environmental impacts associated with this project, and to address these impacts in accordance with local, state, and federal standards. This information is being presented to the Calcasieu Parish Police Jury (CPPJ) – Division of Planning and Development so that it can make a decision on this rezoning request.

Details pertaining to Sasol’s cooperation with other public and private entities are detailed in the developer’s agreement that accompanies this application.

2.0 SASOL GLOBAL

Sasol is an international integrated energy and chemical company that leverages the talent and expertise of our more than 35,000 people working in 37 countries. Sasol develops and commercializes technologies and builds and operates world-scale facilities to produce a range of products including:

**SASOL GLOBAL**
- Based in Johannesburg, South Africa
- US Headquarters in Houston, Texas
- 35,000 Employees in 37 Countries
- Operations produce the building blocks that help make everyday products including detergents, plastics, and liquid fuels.

**CORE VALUES**
Safety-People-Integrity-Accountability-
Stakeholder Focus-Excellence in all that they do

**COMMITMENT**
- Committed to providing a safe working environment for their employees and being a good neighbor in the communities where they operate.
- Committed to advancing sustainable development.
liquid fuels, high-value chemicals and low-carbon electricity. These fuels and chemicals are then used to produce the building blocks that make everyday products such as detergents, plastics, and fragrances.

Sasol is headquartered in Johannesburg, South Africa. Its United States headquarters is in Houston, Texas.

Sasol’s Louisiana industrial facility, known as the Lake Charles Chemical Complex (LCCC), purchased in 2001 from RWE DEA (and formerly known as Condea-Vista), began initial operations in 1961 with the world's largest synthetic Alcohol Unit. Through the 1960s and 1970s, the facility expanded to include a Normal Paraffin Unit, Ethoxylation Unit, Ethylene Unit and Alumina Unit. In 1981, a Linear Alkylbenzene Unit was added to the facility and in 2004 the R&D facility was relocated from Austin, Texas to the LCCC.

Sasol’s goal is to minimize risk, eliminate incidents, responsibly manage environmental impacts, and enable excellence in operations and business performance while providing a workplace that protects our employees, service providers, and neighbors.

Sasol makes important economic contributions to the communities in which it operates. Each year Sasol donates more than $300,000 to local nonprofit organizations and is a major contributor to the economy of Southwest Louisiana through annual taxes and the purchase of goods and services totaling more than $160 million.

### 3.0 THE PROJECTS

Sasol is proposing construction and development of approximately 3,034 acres of property just west of Westlake, Louisiana in central Calcasieu Parish. The projects are composed of two facilities: A chemical facility known as the Lake Charles Cracker Project (LCCP) and a Gas-To-Liquids facility (GTL). The two projects have separate economic drivers, and each can stand alone without the need for the other.

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**LAKE CHARLES CRACKER PROJECT (LCCP)**

- **Ethane “cracking” is the process of breaking down molecules of ethane contained in natural gas to create ethylene**
- Will produce approximately 1.5 million tons of ethylene per year
- **Estimated Cost** $5-$7 billion
- **Schedule**
  - 2014 Begin Construction
  - 2017 Startup

**GAS-TO-LIQUIDS PROJECT (GTL)**

- **First in the US**
- **Proven Technology that converts natural gas into GTL diesel and other products**
- Will convert natural gas into more than 96,000 barrels per day of GTL diesel
- **Estimated Cost** $11-$14 billion
- **Schedule**
  - 2016 Begin Construction
  - 2019 Phase 1 Startup
  - 2020 Phase 2 Startup
The chemical facility will be a world-scale ethane cracker. Ethane “cracking” is the process of breaking down molecules of ethane contained in natural gas to create ethylene, one of the building blocks of the petrochemical industry. The facility will produce approximately 1.5 million tons of ethylene per year. The ethylene will be used in seven downstream derivative plants to produce a range of products such as detergents, fragrances, paints, film, synthetic fibers, and food packaging. Estimated cost of the facility is $5 to $7 billion. Pending final investment decision, construction is set to begin in 2014, with beneficial operations commencing in 2017.

The GTL facility will be the first in the United States. The GTL facility converts natural gas into diesel for transportation, as well as other products. GTL diesel burns cleaner and has lower greenhouse gas emissions than conventional diesel. It is also virtually free of sulfur and aromatic compounds. The facility will product more than 96,000 barrels per day of liquid fuels and chemicals including: GTL diesel, GTL naphtha, liquefied petroleum gas, paraffin, GTL base oils and medium hard waxes. Estimated cost of the facility is $11 to $14 billion. Pending final investment decision, construction would begin in 2016, with beneficial operations commencing in 2019. The project is the largest single manufacturing investment in the history of Louisiana and one of the largest foreign direct investment manufacturing projects in the history of the United States.

The project will be designed with proven, modern pollution control equipment and waste minimization process. The project will also have processes in place that recycle wastewater to minimize environmental impact and conserve water resources.

4.0 SITE LAYOUT

The existing Sasol Lake Charles Chemical Complex is located west of Westlake, Louisiana and is bound by Houston River Road to the north and Old Spanish Trail to the South. The proposed site expansion will occur to the west of the existing Sasol facility.

A general plot plan showing the boundaries of the existing operations, LCCP, GTL, shared facilities, and construction support can be seen in Figure 1.
Similar to Sasol’s existing facility, the LCCP and GTL projects will predominantly be buffered through the use of berms, natural vegetation, and facility buildings. Sasol plans to minimize the visual impact of the LCCP and GTL projects. A driver on Houston River Road would see something similar to what is shown in Figures 2, 3, and 4. Figure 2 represents the visual along Houston River Road looking towards the GTL facility. Similarly, Figure 3 and Figure 4 represent the views of the LCCP from Houston River Road. As you can see, from both angles, the majority of the facilities will be obstructed by a berm which will be manicured with trees and shrubbery. Along Old Spanish Trail, a driver would see tanks and pipe racks in the foreground (Figure 5). The general location of the renderings in relation to the facility plot plan can be seen in Figure 6.
Figure 2: View #1 – Conceptual Rendering of the GTL facility from Houston River Road looking Southwest

Figure 3: View #2 – Conceptual Rendering of the LCCP facility from Houston River Road looking Southwest
Figure 4: View #3 – Conceptual Rendering of the LCCP facility from Houston River Road looking Southwest

Figure 5: View #4 – Conceptual Rendering of the LCCP facility from Old Spanish Trail looking Northwest
5.0 ZONING REQUEST

Sasol is requesting that Calcasieu Parish:

1. REZONE SASOL OWNED PROPERTY: Rezone 1,470 acres of Sasol-owned property from agricultural, single family residential, mixed residential, manufactured home park, general commercial, and light industrial to I-2 Heavy Industrial (Figure 7).

2. COMPLETE A FEASIBILITY STUDY FOR REZONING NON-SASOL OWNED PROPERTY: Complete a feasibility study to rezone approximately 177 acres of non-Sasol owned properties within the overall boundary to I-2 Heavy Industrial. Figure 8 shows both the areas that Sasol is requesting to be rezoned (purple color), as well as the areas they are requesting a feasibility study be completed (green color). If granted, this would result in a uniform I-2 Heavy Industrial zone in this area. A map showing the final proposed zoning can be found in Figure 9 (I-2 Heavy Industrial is shown in purple). Detailed maps and legal descriptions of the proposed rezoning are included as part of the developer’s agreement that is part of this rezoning application.
3. REVOKEMENT AND REDEDICATION OF PUBLIC ROADS: Revoke the following public roads as currently located in their entirety, except for the portions of such roads that may be needed to allow owners to access their properties: 1st Avenue, 2nd Avenue, 3rd Avenue, 4th Avenue, 5th Avenue, 6th Avenue, 7th Avenue, 8th Avenue, Bolsius Road, Center Street, Cynthia Street, Electric Drive (existing location and originally platted location), Evergreen Road, Goldrich Drive, Independence Road, Laurel Avenue, Lincoln Avenue, Madison Street, Merlin Street, Michigan Avenue, Orphanage Road, Powell lane, Rigmaiden Avenue, Trousdale Road, Verret Road, and WB Noris Subdivision Road. In addition revoke all roads within the Sasol property boundary that were previously dedicated or recorded but were not constructed. It is being requested that the 45 acres of revoked roads also be rezoned as I-2 Heavy Industrial. A map showing the requested roads to be revoked can be found in Figure 10.

4. COMPLETE A STUDY FOR THE INCLUSION OF REZONED PROPERTY INTO LOCKPORT INDUSTRIAL DISTRICT: Complete a study to include the 1,692 acres of rezoned I-2 Heavy Industrial property into the existing Lockport Industrial District. A map showing the existing and proposed limits of the Lockport Industrial District can be seen in Figure 11.

See the EXHIBITS section of this report for larger (11”x17”) maps of Figure 1 to Figure 11.

Figure 7: Existing Zoning Map
Lake Charles Cracker Project & Gas-to-Liquids Project
Rezoning Application

Figure 8: Proposed Zoning Map

Figure 9: Final Zoning Map
Figure 10: Proposal for Streets to be Remain, Rededicate, and Revoke

Figure 11: Proposed Lockport Industrial District Expansion
6.0 ECONOMIC IMPACT ASSESSMENT

On behalf of Sasol, NERA Economic Consulting performed the economic impact assessments for establishment of the two proposed stand alone industrial facilities. With cooperation from Sasol, NERA used detailed facility information and customized a state-of-the-art economic model developed by Regional Economic Models, Inc. (REMI) to study the potential economic impacts of the two proposed projects for both the state of Louisiana and the United States. Based on the model results and NERA’s calculations, the LCCP construction is expected to account for 20-40% of total private investment in the state of Louisiana while the GTL Project will account for as much as 44%.

The NERA team also identified expected trends concerning gains within the Louisiana and United States economies. On the front end, project construction expenditures will result in direct economic growth through the employment of construction crews in Louisiana and procurement of construction materials from the United States. Indirect gains can result from the projects’ various needs for goods and services. Income from both direct and indirect sources will induce further gains within the state and national economies. For example, higher employment rates and wages will result in increased spending on other goods and services. Therefore, the construction of the projects presents a multiplier effect. The proposed projects will directly employee more than 5,000 construction workers during peak construction in 2016, increasing overall employment in Louisiana by 30,000 during 2016 due to multiplier effects. Although Sasol plans to hire locally as much as possible, the influx of construction workers will increase the housing demand in Calcasieu Parish. These projects will have a large impact housing availability, rentals, hotels, campgrounds and RV parks, furthering the multiplier effect. When operational the facilities will employee approximately 1,200 workers at an estimated median salary of $89,000 a year, compared with the Calcasieu Parish median salary of $35,772.

Additionally, economists have determined that the construction of such sophisticated operating facilities as those proposed by Sasol would create an agglomeration effect. This essentially means small communities or towns will be generated by the additional businesses, restaurants, and housing that will develop near the proposed project sites to accommodate its workers. Once construction is complete and the facilities are operational, local, state and national economies will continue to experience direct gains through the employment of facility workers. Indirect gains will come from the consumption of domestic goods and services, ranging from local purchases to using natural gas from the United States. Increased spending from direct and indirect gains will continue to promote economic growth on the local, state and national level. In addition, the agglomeration effect will persist throughout the facilities’ operations to accommodate the facility workers.
The sophistication of these projects brings a need for higher education. SOWELA Technical Community College will provide training for these and similar projects. As a result, the College has received $20 million in state funding to begin construction of new facilities and training programs. Construction on the new facilities will begin in 2014, furthering the multiplier effect.

NERA used the REMI model along with detailed expenditure and operational information from Sasol, to estimate gains in the Louisiana economy throughout the two proposed projects’ construction and operations. The table below identifies the average annual economic gains for the LCCP and GTL projects. Gains from the LCCP are calculated over the period of 2013-2041, and the GTL Project gains are predicted for the period of 2013-2044.

<table>
<thead>
<tr>
<th>Category</th>
<th>LCCP Increase / year</th>
<th>GTL Project Increase / year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louisiana Gross State Product (GSP)</td>
<td>$900 million</td>
<td>$3.3 billion</td>
</tr>
<tr>
<td>Louisiana Personal Income</td>
<td>$300 million</td>
<td>$1.7 billion</td>
</tr>
<tr>
<td>Louisiana Employment</td>
<td>3,900 jobs</td>
<td>21,000 jobs</td>
</tr>
<tr>
<td>Louisiana Government Revenue</td>
<td>$50 million</td>
<td>$235 million</td>
</tr>
</tbody>
</table>

According to the economic models, Sasol will pay an average of $150 million in property taxes to Calcasieu Parish in “year 11” between the two facilities. Beyond the local and state level, income generated by the two projects will contribute to the national economy through the purchase of domestic goods and services by Sasol, its employees, and the members of the agglomeration. NERA used the REMI model to also estimate monetary gains for the United States economy from the construction and operations of the two proposed projects. The table below identifies average annual gains estimated for both projects. As with Louisiana’s economic forecast, gains for the LCCP are averaged over the period of 2013-2041, and the GTL Project gains are averaged for the period of 2013-2044. Economic growth for the United States economy includes the predicted values shown above in Louisiana’s gains.

<table>
<thead>
<tr>
<th>Category</th>
<th>LCCP Increase / year</th>
<th>GTL Project Increase / year</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Gross Domestic Product (GDP)</td>
<td>$5.1 billion</td>
<td>$7.8 billion</td>
</tr>
<tr>
<td>US Personal Income</td>
<td>$2.1 billion</td>
<td>$3 billion</td>
</tr>
<tr>
<td>US Employment</td>
<td>38,000 jobs</td>
<td>55,000 jobs</td>
</tr>
<tr>
<td>US Government Revenue</td>
<td>$260 million</td>
<td>$439 million</td>
</tr>
<tr>
<td>US Net Exports</td>
<td>--</td>
<td>$1.7 billion</td>
</tr>
</tbody>
</table>

Overall, the NERA study results indicate that substantial growth is expected within Calcasieu Parish, the state of Louisiana, and U.S. economies as a result of the proposed construction and operations of Sasol’s two projects.
7.0 SAFETY, HEALTH, AND ENVIRONMENTAL

Sasol is committed, at the highest level, to safe and reliable operations. Sasol’s Safety, Health, & Environment (SHE) policies articulate their corporate commitment to safety and reliability.

Resource Report 11, which is part of the Environmental Assessment completed by URS Corporation on behalf of Sasol, describes the design, construction, operation, and maintenance measures to maximize the projects’ reliability and to minimize potential hazards to the public from potential failure of project components and/or chemical releases as a result of accidents or natural catastrophes.

Sasol follows a wide range of state and federal regulations and guidance documents that apply to the design and operations of new facilities. Some of these include:

- Process Safety Management (29 CFR 1910.119)
- Risk Management Program (40 CFR Part 68)
- The National Oil and Hazardous Substances Pollution Contingency Plan and the Area Contingency Plans for the local Area
- US Coast Guard Marine (USCG) Safety Manual
- Occupational Safety and Health Administration (OSHA) requirements for worker health and safety (29 CFR 1910.120)
- USCG National Preparedness for Response Exercise Program
- OSHA Employee Emergency Plans and Fire Prevention
- Spill Prevention and Control
- Startup, Shutdown, and Malfunction Plans (40 CFR Part 63)
- Department of Homeland Security CFATS Program
- Louisiana Department of Natural Resources Pipeline Safety Program

SASOL’S COMMITMENT TO SAFETY, HEALTH, AND THE ENVIRONMENT (SHE)

We, the people of Sasol, striving for excellence in all we do, recognize the impact that our activities can have on people and the environment. Safety, health and protection of the environment will form an integral part of our planning and decision making. We will manage our company, wherever we do business, in an ethical way that strikes an appropriate and well-reasoned balance between economic, social and environmental needs. We expect our employees and service providers globally, to take personal responsibility to embrace this ambition in all of our day-to-day activities.

Our goal is to eliminate incidents, minimize risk, responsibly manage environmental impacts and enable excellence in operations and business performance while providing a workplace that takes into account the safety and wellbeing of our people and service providers.
Sasol has many Sasol-Specific operation standards that will govern the design and operations of the new facilities with rules, regulations and guidelines for:

- Incident Investigation and Reporting
- Personal Protective Equipment
- LCCC Railroad Car Derailment
- Respiratory Protection Procedure
- Hazardous Waste Operations And Emergency Response
- Hurricane Preparedness
- Fire Protection
- LCCC Emergency Notification/Call-Out Procedure
- LCCC Security Procedure
- LCCC Emergency Response Team Procedure
- LCCC Community Awareness and Emergency Response (CAER) Procedure
- LCCC Southwest Louisiana Mutual Aid Procedure
- LCCC Emergency Head Count Procedure
- Incident Command System
- Emergency Telephone Numbers
- Site Topography

Sasol has planned the design, construction, and operation of its proposed LCCP and GTL projects to avoid potential and real adverse environmental effects as much as possible. Strategized planning, well designed engineering technologies, and best operating practices will be used to avoid both potential and real adverse environmental effects.

The likelihood for potential hazards will be reduced during the design phase by using buffer strips or other methods of physical separation around the project sites and siting and safety design to prevent failures due to natural risks. Other engineered designs, when applicable will use the International Code Council for further protection of human life and environment. The proposed projects would be built to meet or exceed the most stringent national and international safety standards, which include full containment storage tanks, multiple gas detectors, infrared fire detectors, closed-circuit cameras, stringent security measures and advanced safety training. Equipment-design specifications are rigorously reviewed to protect operational integrity.

All construction will be conducted pursuant to guidelines of a quality assurance program as implemented by the project management team. The operation will benefit from intensive personnel selection and training, strict procedures, knowledgeable supervision, and diligent overview by management.

Sasol is a proud and active member of the Lake Area Industry Alliance (LAIA), which is comprised of 23 local industries. Sasol’s participation in the LAIA enhances the safety of its facility in several ways. It enables Sasol to learn best practices from other industries, it provides incentive for Sasol to achieve high levels of safety as these safety records will be communicated by LAIA throughout the area, and it enables Sasol to develop communications with community officials that are beneficial in the event of an emergency.
In addition Sasol is a long-standing member of the Southwest Louisiana Mutual Aid (SLMA). The objective of this organization is the joining together of fire-fighting, law enforcement, rescue, and first aid manpower and facilities among Southwest Louisiana industries and municipalities for mutual assistance in case of emergency situations - either natural or man-made.

SASOL’S SAFETY, HEALTH, AND THE ENVIRONMENT PRINCIPLES

- Conducting their business with respect and care for people and the environment
- Responsible utilization of natural resources
- Implementing responsible care for all Sasol’s chemical and associated businesses. Non-chemical business will implement appropriate, recognized codes of practice.
- Continually improving our safety, health and environmental performance.
- Complying, as a minimum, with all applicable legal and other agreed requirements.
- Promoting dialogue with stakeholders about safety, health, and environmental performance.

SASOL ACHIEVES THESE BY:

- Implementing internationally recognized safety, health, environmental and quality management systems.
- Developing and implementing inherently safer and cleaner technologies.
- A ‘cradle to grave’ approach to the products we develop, manufacture, use, distribute, and sell.
- Informing and appropriately training all employees and contractors on safety, health, and environmental matters.
- Responding effectively to safety, health, and environmental emergencies involving our operations and products.
- Engaging with relevant authorities and institutions on the formulation of legislation, standards, and the implementation thereof.
- Benchmarking internationally on best safety, health, and environmental practices.
- Sharing safety, health, and environmental reduction best practices throughout Sasol.
- Providing appropriate resources required to implement the above.
8.0 ENVIRONMENTAL PERMITTING

Sasol’s goal is to responsibly manage potential environmental impacts while promoting operational excellence and business performance. Sasol is committed to complying with all environmental regulations, specifically to implement the necessary mitigation measures in cooperation with all regulatory agencies. Sasol is seeking various permits from state and federal agencies to allow the new construction of the LCCP and GTL projects. Some of these permits include various air quality permits, wastewater permits, pre-construction and post-construction stormwater permits, and US Army Corps of Engineers (USACE) wetland permits. A complete list including the agency and status are listed within this report.

<table>
<thead>
<tr>
<th>LCCP and GTL Permits</th>
<th>Agency</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Air Act (CAA) Prevention of Significant Deterioration (PSD) Permit</td>
<td>Louisiana Department of Environmental Quality (LDEQ)</td>
<td>Permit application submitted to LDEQ: April 30, 2013 Public hearing: March 25, 2014 Anticipated authorization date: May 2014</td>
</tr>
<tr>
<td>CAA Title V Permits</td>
<td>LDEQ</td>
<td>Permit applications submitted to LDEQ: April 30, 2013 Public hearing: March 25, 2014 Anticipated authorization date: May 2014</td>
</tr>
<tr>
<td>Clean Water Act (CWA) Section 404 and Rivers and Harbors Act (RHA) Section 10 Permit</td>
<td>U.S. Army Corps of Engineers (USACE)</td>
<td>LCCP/GTL Application submitted: July 24, 2013 Anticipated authorization date: June 2014 Construction Dock Application submitted: May 20, 2013 Anticipated authorization date: June 2014</td>
</tr>
<tr>
<td>CWA Section 401 Water Quality Certification</td>
<td>LDEQ</td>
<td>Application Submitted: July 24, 2013 Anticipated Authorization date: June 2014</td>
</tr>
<tr>
<td>CWA Louisiana Pollutant Discharge Elimination System (LPDES) Permit (Industrial Wastewater Discharge Permit)</td>
<td>LDEQ</td>
<td>Permit renewal and modification application submitted to LDEQ: April 30, 2013 Anticipated authorization date: May 2014</td>
</tr>
<tr>
<td>LPDES Storm Water General Permit for Construction Activities - Five Acres or More (LAR100000)</td>
<td>LDEQ</td>
<td>Notice of Intent submitted: January 7, 2014 Permits received: January 22, 2014</td>
</tr>
<tr>
<td>Louisiana Multi-Sector General Permit (MSGP, LAR05M448) for Storm Water</td>
<td>LDEQ</td>
<td>Obtained: the existing facilities hold a Multi-Sector General Permit that will need to be modified at the appropriate time to cover the LCCP and GTL projects</td>
</tr>
<tr>
<td>Louisiana General Permit for Hydrotest Water (LAG679012)</td>
<td>LDEQ</td>
<td>Obtained: the existing facility hold a Hydrotest permit and can be utilized by the LCCP and GTL projects</td>
</tr>
<tr>
<td>Solid Waste Permit</td>
<td>LDEQ</td>
<td>Obtained: the existing facility has a solid waste generator ID and no new solid waste permitted units are anticipated for the LCCP and GTL Projects.</td>
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### Environmental Permits for the Lake Charles Chemical Complex Existing Facilities

<table>
<thead>
<tr>
<th>Existing LCCC Permits</th>
<th>Agency</th>
<th>Description and Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Air Act Prevention of Significant Deterioration Permit</td>
<td>LDEQ</td>
<td>Alumina Unit No. PSD-LA-644 (approval of modification to LCCC Alumina Unit, in effect from 9/19/00 to 3/19/02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAB Unit No. PSD-LA-291 (M-3) (approval of modification to LCCC Linear Alkyl Benzene Unit on 11/29/10)</td>
</tr>
<tr>
<td>Clean Air Act Title V Permits</td>
<td>LDEQ</td>
<td>Alumina Unit Title V No. 2565-V6 (approval of operating permit renewal and modification for the LCCC Alumina Unit, in effect from 10/8/12 until 10/8/17)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethylene-Activated Sludge-Steam Unit Title V No. 2743-V5 (approval of permit modification for the LCCC Ethylene/Activated Sludge /Steam Unit, in effect from 7/12/12 until 8/8/13)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAB Unit Title V No. 2894-V4 (approval of permit modification for the LCCC Linear Alkyl Benzene Unit, in effect from 7/13/12 until 11/29/15)</td>
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<tr>
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<td>NPU Unit Title V No. 2896-V5</td>
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<td>Alcohol Unit Title V No. 2865-V4 (approval of permit modification for the LCCC Alcohol Unit, in effect from 9/27/11 until 6/14/16)</td>
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<tr>
<td></td>
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<td>ETO Unit Title V No. 2325-V4 (approval of permit modification for the LCCC Ethoxylation Unit, in effect from 11/1/12 until 12/9/13)</td>
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<tr>
<td></td>
<td></td>
<td>CoMonomer Unit Title V No. 3088-V1 (approval of permit modification for the LCCC CoMonomer-1 Unit, in effect from 2/22/13 until 4/25/16)</td>
</tr>
<tr>
<td>CWA Section 404 and Rivers and Harbors Act Section 10 Permit</td>
<td>USACE</td>
<td>MVN-2011-02625-WNN (for work related to construction of the Comonomer 1 unit (a/k/a Tetrimerization unit including parking lot, warehouse, receiving area, construction access and haul roads, material storage area)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MVN-2012-1425-WB (for construction of a railcar storage facility off of E. Burton St.)</td>
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<td>MVN-2004-294-WKK (for construction of a locker room for alcohol unit and a first aid bldg.)</td>
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<tr>
<td></td>
<td></td>
<td>MVN-2001-1302-WJJ (to install box culverts)</td>
</tr>
<tr>
<td>CWA Louisiana Pollutant Discharge Elimination System (LPDES) Permit (Industrial Wastewater Discharge Permit)</td>
<td>LDEQ</td>
<td>LPDES Permit No. LA00033336 in effect from 12/1/09 until 11/30/14; renewal application was filed on 4/30/13)</td>
</tr>
<tr>
<td>Louisiana LPDES Storm Water Multi-Sector General Permit (MSGP, LAR05M448)</td>
<td>LDEQ</td>
<td>LPDES Storm Water Multi-Sector General Permit No. LAR05M448 (reissuance notice on 5/27/11 for LPDES storm water general permit for the LCCC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active Construction Storm Water Permit LAR10H509 (for discharges to Bayou Verdine resulting from construction activities associated with construction of the Comonomer 1 unit – construction nearly complete at this time)</td>
</tr>
<tr>
<td>CWA Section 401 Water Quality Certification</td>
<td>LDEQ</td>
<td>WQC 120613-01 issued 8/8/12 for Corps Permit MVN-2012-1425-WB to clear land and place fill material for the construction of a railcar storage facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WQC 111208 issued 1/6/12 for Corps Permit MVN-2011-02625-WNN to clear land and place fill material for industrial facility expansion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WQC 110602-02 issued 6/21/11 for Corps Permit MVN-2001-1302-WJJ to install box culverts for industrial facility expansion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WQC 090625-02 issued 7/21/09 for Corps Permit MVN-2004-2924-WKK to clear land and place fill material for construction of an alcohol locker room and first aid office building</td>
</tr>
</tbody>
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9.0 TRAFFIC IMPACT ANALYSIS

A development the size of Sasol’s LCCP and GTL facilities will inevitably impact traffic within the Parish. Sasol contracted Alliance Transportation Group to complete a Traffic Impact Analysis (TIA) to evaluate the traffic impacts of the site on the adjacent roadway network and to determine the road traffic improvements necessary to mitigate these impacts.

Analysis was performed under the following scenarios:
- Existing Conditions (2013)
- Construction Ramp-Up Phase 1 (January 2015)
- Construction Ramp-Up Phase 2 (May 2015)
- Peak Construction Phase (February 2016)
- Plant Operations and Maintenance Phase (2020)

The study was completed using a timeline of worker activity which anticipates that the project site will generate approximately:
- 1,700 worker trips during construction Ramp-up Phase 1
- 3,400 worker trips during construction Ramp-up Phase 2
- 5,100 worker trips during Peak Construction Phase
- 1,700 worker trips post construction during the Plant Operations and Maintenance Phase

The Traffic Impact Analysis (TIA) evaluated the impact of the traffic associated with the project on the surrounding roadway network. A total of 26 intersection operations were evaluated: 15 within the immediate study area and 11 related to off-site parking facilities.

To mitigate the effect of site generated traffic in the immediate proximity of the construction site, Sasol has proposed to implement three off-site parking facilities and shuttle service for its employees. The off-site parking locations analyzed include:
- Cities Service Highway (LA 108) and Napoleon Street (US 900)
- Beglis Parkway (LA 27) and Louis Alleman Parkway
- Beglis Parkway (LA 27) and Mosswood Road.

Additionally, Sasol identified that there will be multiple shifts during construction to minimize disruptions to the surrounding roadway network. There will be two day shifts; one beginning at 6:00 AM and one beginning at 6:30 AM. Approximately 45 percent of the workforce will be assigned to each of these shifts. The remaining 10 percent of the workforce will be assigned to the night shift, which is proposed to begin at 6:00 PM. The intersection improvement locations and corresponding phase for all mitigation measures are illustrated in Figure 12.

![Figure 12: Improvement Locations by Construction Phase](image)

At the time of this application Sasol has received comments from CPPJ and LA DOTD on the TIA. Sasol will address these, as well as any additional comments. Sasol also agrees it will continue to work with both the Parish and LA DOTD to mitigate traffic impacts. At a minimum the road traffic improvements included in this report will be completed upon completion of the financial investment decision to move forward with the projects. Some of these intersections will be analyzed for potential roundabout locations, based on comments from CPPJ and LA DOTD.
Ramp-Up Phase 1 (January 2015)

During the Ramp-up Phase 1, all construction employee traffic will be on-site with access to the site from Evergreen Road, west of the KCS rail line. It is expected that 1,700 workers will be on site for this phase of construction. After analysis of the existing infrastructure in the area surrounding the project site, construction of the following roadway improvements prior to the beginning of Ramp-up Phase 1 include:

- I-10 Service Road and I-10 Eastbound Westlake Ramps: Modify signal timing
- Sampson Street (LA 378) at Sulphur Avenue (LA 379): Modify signal timing
- Sampson Street (LA 378) at John Stine Road: Modify signal timing
- Old Spanish Trail at Trousdale Road: Construct eastbound right-turn lane
- Old Spanish Trail at Prater Road: Install traffic signal; Construct westbound left-turn bay and eastbound right-turn bay
- Old Spanish Trail at Evergreen Road: Install traffic signal; Construct eastbound left-turn bay; Construct channelized westbound right-turn bay with additional northbound acceleration lane on Evergreen Road exiting the intersection; Construct southbound right-turn bay
- Houston River Road (LA 379) at Beglis Parkway (LA 27): Modify signal timing

Preliminary construction cost estimates for the improvements associated with this construction phase total $1,288,000.

Ramp-Up Phase 2 (May 2015)

In Ramp-up Phase 2, some laborer parking will be on-site with additional parking provided at two off-site locations. The off-site parking will be implemented near the intersections of Napoleon Road (US 90) at Coach Williams Drive (LA 108) and Beglis Parkway (LA 27) at Louis Alleman Parkway. On-site parking will continue to access the site from Evergreen Road, west of the KCS rail line. It is expected that 3,400 workers will be on site for this phase of construction.

The following intersection improvements and traffic control modifications will be implemented to accommodate all the site generated traffic.

- Beglis Parkway (LA 27) at Louis Alleman Parkway: Install traffic signal; Construct westbound lane to be shared by through and right turning vehicles
- Beglis Parkway (LA 27) at Burton Street: Construct westbound right-turn bay
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- Napoleon Street (US 90) at Coach Williams Drive (LA 108): Modify signal timing to allow for permissive/protected eastbound left turn
- Coach Williams Drive (LA 108) at Maplewood Drive: Modify signal timing

Preliminary construction cost estimates for the improvements associated with this construction phase total $427,000.

Peak Construction Phase (February 2016)

During the Peak Construction Phase, parking will be the same as Ramp-up Phase 2 with an additional off-site parking facility located near the intersection of Mosswood Road and Beglis Parkway (LA 27). On-site parking will continue to be accessed via Evergreen Road. It is expected that 5,100 workers will be on site for peak construction.

In order to accommodate the site generated traffic from the Peak Construction Phase, the construction of the following roadway improvements prior to the beginning of this phase include:

- Napoleon Street (US 90) at Prater Road: Modify signal timing
- Napoleon Street (US 90) at Trousdale Road: Modify signal timing
- Beglis Parkway (LA 27) at Houston River Road (LA 379): Construct eastbound right-turn bay and northbound right-turn bay
- Beglis Parkway (LA 27) at Louis Alleman Parkway: Modify striping on the westbound approach to allow for a dual left-turn during the PM peak hour
- Beglis Parkway (LA 27) at I-10 WB Ramps: Install traffic signal; Modify pavement markings to create a westbound right-turn bay
- Arizona Street (LA 27) at Patton Street: Construct westbound right-turn bay
- Arizona Street (LA 27) from south of Patton Street to Mosswood Road: Widen roadway to four lanes (two in each direction)

Preliminary construction cost estimates for the improvements associated with this construction phase total $3,298,000.
Plant Operations & Maintenance Phase (2020)

During the Operations and Maintenance Phase, all traffic will be located on-site with access primarily from Evergreen Road, west of the KCS rail line. It is expected that 1,700 workers will be on site for the post construction phase of normal plant operations and maintenance.

In order to accommodate for all construction employee trips being directed to on-site parking, the analysis determined the following mitigation measure:

- Sampson Street (LA 378) at John Stine Road: Construct eastbound and westbound left-turn bays and modify signal phasing for protected/permitless left turns

Preliminary construction cost estimates for the improvements associated with this phase total $228,000.
Total construction cost estimates for the improvements associated with all phases of construction total $5,241,000.

10.0 DRAINAGE IMPACT ANALYSIS

As part of the local permitting process with Calcasieu Parish, Sasol submitted a Drainage Impact Analysis (DIA) to CPPJ per the requirements of Parish Ordinance 5429. The main goal of the DIA was to demonstrate that the LCCP and GTL projects were designed to have no adverse impact on surrounding drainage.

No adverse impact means that total flood risk, contamination, erosion, and peak runoff rates will not increase on surrounding areas as a result of the project. The report demonstrated that the interim phases of construction and final site will be built in a manner to ensure no adverse impact on surrounding property. Sasol’s DIA (signed and dated January 20th, 2014) was prepared by URS Corporation and provides an in-depth evaluation of the future effects of the LCCP and GTL projects on surrounding drainage. This DIA was approved by the CPPJ on February 20, 2014.

A potential impact during the development of Greenfield property is an increase in stormwater runoff. The DIA established baseline land use drainage conditions and runoff characteristics and compared them to the proposed runoff conditions from the development. The DIA proposes methods to mitigate these impacts. Detention ponds are a standard practice to reduce runoff and flood potential from new developments.
Bayou Verdine and Contamination Control

Bayou Verdine is the controlling variable in the drainage on this site and design measures were taken to ensure that the project would not increase the flood levels on this system. Offsite areas to the north flow through the site via Bayou Verdine and these areas were included in the DIA. The Bayou Verdine system eventually flows into the Calcasieu River. The design basis for this project was the 100-year and 10-year return period rainfall events.

Drainage areas for the proposed site include only those areas that will contribute to the pond/Bayou Verdine system. Areas that contain potentially contaminated runoff will be collected internally and will not contribute to the stormwater system. These areas were not included in the drainage areas.

Rainfall Runoff Determination

The Soil Conservation Service Curve (SCS) Number Method was used to calculate the existing and post-development runoff potential from the site. This method assigns a number to a parcel of land based on the type of soil, conditions of the soil, and land cover. A higher curve number (e.g., paved surface) produces more stormwater runoff per acre.

The SCS Unit Hydrograph method was used to transform runoff potential into actual flow rates passing for the site and surrounding areas. The main variable in the SCS method is time of concentration. Time of concentration measures how fast water accumulates from a given area. Sloped areas (e.g. rooftops and parking lots) and hardened surfaces speed up the water and shorten the time of concentration compared to grassed or forested areas. Detailed calculations were performed to establish the SCS variables for each sub-basin within the project and surrounding study area. Sasol proposes nine (9) detention ponds as part of the construction to mitigate the increased runoff volume from the development.

The DIA used FEMA-approved numerical models to calculate current conditions and to evaluate the effectiveness of the proposed mitigation measures. HEC-HMS calculates the peak runoff values and HEC-RAS computes the flood risk (flood depths) on surrounding property. Taken together the models have the capability of accurately evaluating the entire drainage system and are the most frequently used design combination for pre-post drainage analysis.
Flood Risk Determination

The hydraulic (HEC-RAS) model of the site analyzed the existing flood depths of the onsite channel network and was used to ensure the post-development conditions would not adversely impact the floodplain. A geometric model of the channel network stream centerlines and channel cross-sections was created using LiDAR data for the area and site-specific topographic survey data. Components of the hydraulic model are channel slope, vegetation density and bank conditions, and bridge and culvert crossings. These were investigated closely and are crucial in the models water surface elevation results.

A major component of the proposed development is re-routing of Bayou Verdine which currently flows through the proposed development area. The rerouted channel will be lined with concrete through the bends and bridge crossings to minimize scour potential in these vulnerable sections. Figure 13 shows a comparison of the existing Bayou Verdine alignment with the proposed channel alignment.

![Figure 13: Existing versus Proposed Channel Alignment of Bayou Verdine](image)

Mitigation Measures and FEMA Flood Zone Implications

The results suggest that the re-routed channel coupled with a 9 pond detention system will provide adequate mitigation to ensure no adverse impact on surrounding flood levels. The channel re-route will keep the 100-year floodplain within its banks and will not increase the limits of the flood zone on surrounding property.
Note that the current effective FEMA Flood Insurance Study for this area was completed in 1988 – long before the creation of LiDAR products and expansion of surrounding industrial areas. Any future revisions to the FEMA flood insurance maps on Bayou Verdine (if any) will be the result of external factors not attributable to the LCCP and GTL facilities. Such external factors typically include improved modeling technology, use of high-resolution LiDAR and topographic survey data, changes in survey methods, and increased development of surrounding industrial areas. It was not the purpose or scope of this local study to revise the regional FEMA flood insurance maps for Bayou Verdine.

However, for the channel re-route a Conditional Letter of Map Revision (CLOMR) permit request will be prepared and submitted to FEMA as part of the permit process. This is required by FEMA when proposed projects could alter the hydrologic or hydraulic characteristics of a flooding source and result in modifications to the floodway, Base Flood Elevations (BFE), or Special Flood Hazard Area (SFHA). Once construction is complete, a Letter of Map Revision (LOMR) study will be performed to verify that the development took place as proposed. Once the LOMR is approved by FEMA, the effective Flood Insurance Rate Map (FIRM) is updated on location to reflect the completed project. The DIA shows that the proposed development will cause no adverse impacts to the local floodplain and flooding depths.

A phasing analysis was conducted as part of the DIA to ensure that during construction no adverse floodplain impacts would occur. This is due to the possibility that the GTL Project may not be constructed coincident with the LCCP. The DIA proves that construction phasing of the development will not cause adverse impacts to surrounding areas.

11.0 CONCLUSION

This report details Sasol’s commitment to the Parish, through the completion of its economic, drainage, and traffic impact analysis. Sasol will continue to work to ensure that all safety, environmental, and health aspects are met throughout the planning, construction, and implementation of the projects described herein.

This rezoning application details Sasol’s request that Calcasieu Parish rezone 1,470.85 acres of Sasol owned property to I-2 Heavy Industrial. In addition Sasol is requesting that the Calcasieu Parish – Division of Planning and Development complete a feasibility study to rezone approximately 176.52 acres of isolated properties within the overall boundary to I-2 Heavy Industrial. Sasol is also requesting that the Parish complete a study to incorporate the newly rezoned, I-2 Heavy Industrial properties into the existing Lockport Industrial District.

The accompanying Developer’s Agreement, maps, and legal descriptions also detail Sasol’s further commitment to the entities within the area.
REFERENCES


EXHIBITS

EXHIBIT 1: Project Plot Plan
EXHIBIT 2: View #1 – Conceptual Rendering of the GTL facility from Houston River Road looking Southwest
EXHIBIT 3: View #2 – Conceptual Rendering of the LCCP facility from Houston River Road looking Southwest
EXHIBIT 4: View #3 – Conceptual Rendering of the LCCP facility from Houston River Road looking Southwest
EXHIBIT 5: View #4 – Conceptual Rendering of the LCCP facility from Old Spanish Trail looking Northwest
EXHIBIT 6: General location of the renderings views
EXHIBIT 7: Existing Zoning Map
EXHIBIT 8: Proposed Zoning Map
EXHIBIT 9: Final Zoning Map
EXHIBIT 10: Proposal for Streets to Remain, Rededicate, and Revoke
EXHIBIT 11: Proposed Lockport Industrial District Expansion
CONCEPTUAL DESIGN: VIEW #3 - HOUSTON RIVER ROAD LOOKING SOUTHWEST
CONCEPTUAL DESIGN: VIEW #4 - OLD SPANISH TRAIL ROAD LOOKING NORTHWEST
This map shows the area...
Proposal For Streets To Remain, Rededicate, & Revoke
This map shows the existing Lockport & Nelson District & proposed Lockport District Expansion.