

**sasol**  
reaching new frontiers



**safety  
first** 

*Be aware, prepare,  
take care.*

# SASOL GAS SPACE ASSETS NEEDS

---

1. SAFETY MINUTE

2. SASOL GAS PIPELINE COMPANY

3. THREATS ON OUR PIPELINE

4. WHAT SASOL GAS NEEDS FROM SPACE ASSETS

# Results of Pipeline failures

***This incident occurred in America. It's a good reason why you should dial service providers before you excavate to determine if any services exist in the proposed excavation site.***

- ***The following pictures are a result of a worker on a farm using a post hole digger - he struck an underground, high-pressure gas main. Two homes, associated sheds and vehicles were lost.***
- **The pipeline was operated at 70 Barg.**
- ***They never found traces of the operator.***









# Why are we all here...

---

- Sasol Gas Policy and values is on Safety
- Our prime objective is to innovate for safe operations

Therefore the reason we are all here:

- To research and discover new smart technologies that will help us to be cost effective and efficient in future

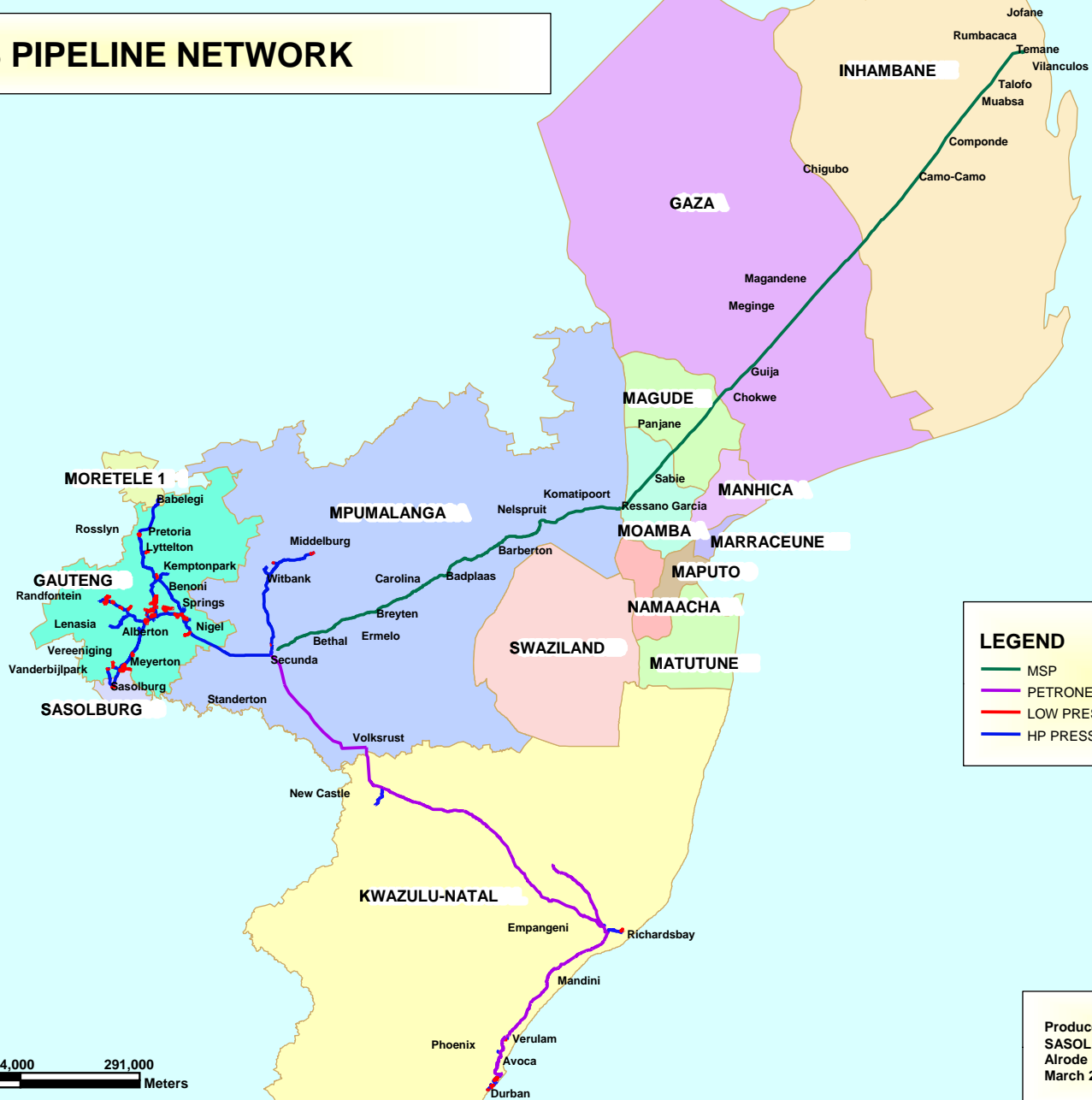


# SASOL GAS PIPELINE COMPANY

---

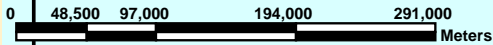
- Sasol Gas operates and maintains underground gas and liquid pipelines
- Operates and maintains own Natural gas and Methane rich gas pipelines in South Africa ~ 1200km
- Contracted to operate and maintain the high pressure Mozambique to South Africa gas transmission pipeline including 1 compressor station located in Komatipoort ~ 865km long
- Contracted to maintain 6 other petrochemical pipelines ~ 600km
- The National Energy regulator of South Africa (NERSA) has Licensed Sasol Gas to operate the pipe gas transmission, distribution and trading business

# SASOL GAS PIPELINE NETWORK



**LEGEND**

- MSP
- PETRONET PIPELINE
- LOW PRESSURE PIPELINE
- HP PRESSURE PIPELINE



Produced by:  
**SASOL GAS GIS TEAM**  
 Alrode  
 March 2003

# Total Pipeline length



## Natural Gas

Length

Transmission Pipelines	1690 km
Distrubution Pipelines	314 km
Service Pipes	19 km

**Total 2023 km**

Lilly - MRG	583 km
Other Gas lines	18 km

**601 km**

Product Pipelines **474 km**

**Total Length 3098 km**

## New Pipelines under construction

**GNP 156 km**

**SNI 156 km**

# Compressor station - Komatipoort





# Pressure Protection Station (PPS)



# Major threats to sasol gas assets

SASOL  
reaching new frontiers



- **external interference** - unintentional damage to underground assets eg. 3rd party contractors erecting underground utilities
- **sabotage/theft on critical assets** – solar energy units, electrical cabling eg. In Mozambique, Solar energy panels have been stolen on several occasions
- **sabotage/theft on communication assets** – cellular sim cards used in remote communication eg. In Gauteng region, numerous sim cards theft have been reported.
- **ecological** – soil erosion, landslides and earthquakes eg. In western Gauteng a historic number of earth tremors have been reported via USGS and SACGS
- **encroachment** – formal and informal developments eg. Informal housing erected near pipelines.

# External damage on pipelines

---





# Encroachment by the public



# Encroachment



# Mitigated Encroachment

Before



After



# Re-Zoning resulting residential development



# Sabotage on equipment



# Ecological threats



11 10:33AM

# Ecological threats – erosion due to heavy rains

---



# The need for PIMS

---

- Today, gas and oil operators are requested to put in place a pipeline integrity management system (PIMS) in order to prevent
  - Interruption of supply
  - Accidents and casualties
  - Damage to the environment
  - Damage to the image of the stakeholders
  - Maintain legal license to operate



# PIMS strategies

---

- Today, our pipeline operating strategies make use of
  - Helicopter inspections (bi-weekly to monthly)
  - Vehicle inspections
  - Foot patrol inspections
  - Seasonal cathodic protection monitor by foot patrol (“24 hour recordings” dataloggers at 300 m interval to recognize corrosion from trends)
  - Direct assessment (external corrosion assessment -> dig up)
  - Pig runs every 7 years (internal inspection)
  - Information management of all data
  - Reaction based on threat level and pipeline risk assessment, e.g. high consequence areas

# What Sasol Gas needs from space technology?

---



Smarter solutions to be preventive rather than reactive:

- Remote monitoring gas and liquid pipeline assets
- Monitor leakages
- Monitor vegetation changes in pipeline servitudes
- Monitor external interference
- Monitor encroachment
- Monitor ecological changes
- Integration with Sasol Gas Central Control room and current PIMS system

# PIMISIS Feasibility Study

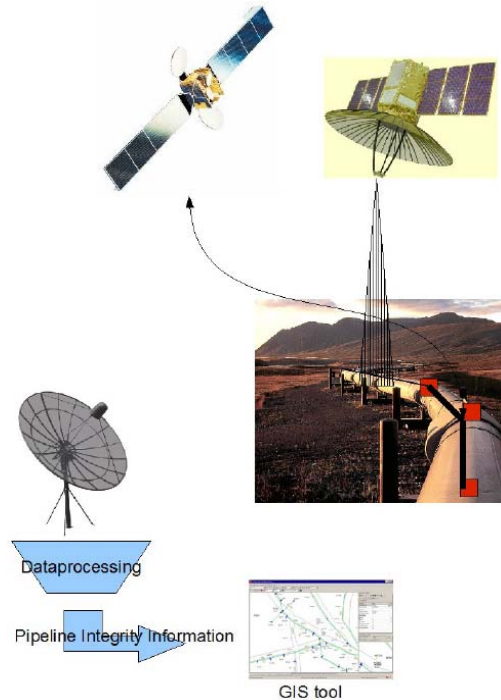
## Objective Feasibility Study

Assess use of space assets for a pipeline integrity monitoring service

- seamlessly integrating data from terrestrial, aerial and space-based sources
- better focus of inspection resources
- reducing operational hazard at same cost or v.v.

## Stakeholders involved

- Prime: **S&T** (NL)
- Subs: **EuroPims**, Ursa Minor (NL)
- Users: Gas pipeline operators **SASOL** (SA), GasUnie (NL)



## Added-value of space

Earth observation data (SAR, optical)

- Surface changes (encroachment, excavation, erosion, landslides)
- Integrated into PIMS procedures via staggered approach (low res, hi-res data, in-situ)

## Satellite Navigation

- Geotagging/coordinating helicopter/in-situ observations/maintenance

## Satellite Communications

- Allows real-time and centralized data collection in remote regions

---

**THANK YOU**

**ANY QUESTIONS?**