CSG Business Transformation

Transforming data to actionable information to empower a rapidly scaling CSG Operation

POSC Caesar | 31 October, 2012

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The Business Imperatives

Origin QLD CSG Business Challenges:

- Safety of personnel
- One of the first global instances of a commercial scale production of LNG from CSG
- Topography
- Infrastructure desert
- High growth business with a reliance on tacit knowledge
- Silo centric operational methodology
- Data/Information not regarded as an asset
- Ad-hoc systems & processes to support "stay in business" at the expense of efficiency

Oil & Gas Challenges*

- Addressing sustainability issues;
- Complying with regulatory & reporting requirements;
- Improving performance and operational effectiveness;
- Industry transactions & consolidation
- Managing financial risk;
- Managing geopolitical risk;
- Recruiting and retaining a skilled workforce ;and
- Securing the supply.

Source: PwC - http://www.pwc.com

What is Integrated Operations?

Integrated Operations (IO) is about making faster, better decisions and it achieves this through:

1. Moving to a real-time or near real-time way of working
2. Breaking down geographical boundaries of remote operations
3. Moving to multi-disciplinary teams

IO is the integration of people, process & technology to expedite the decision making process in a collaborative environment that is enabled by the use of data & multi-disciplinary process orchestration.

Why Integrated Operations?

Some of the benefits of IO are as follows:

Statoil Benefits	Aligned Origin Benefit Category
Improved HSE	Safety performance
More efficient drilling operations	Cost reduction
Better placement of wells	Increased capacity
Production optimisation	Increased capacity
Increased recovery	Increased capacity
Better reservoir and production control	Risk mitigation
Better monitoring of equipment and more efficient maintenance	Cost reduction
Better resource exploitation	Increased capacity
Increased regularity (uptime)	Risk mitigation

Source: Statoil - http://www.statoil.com

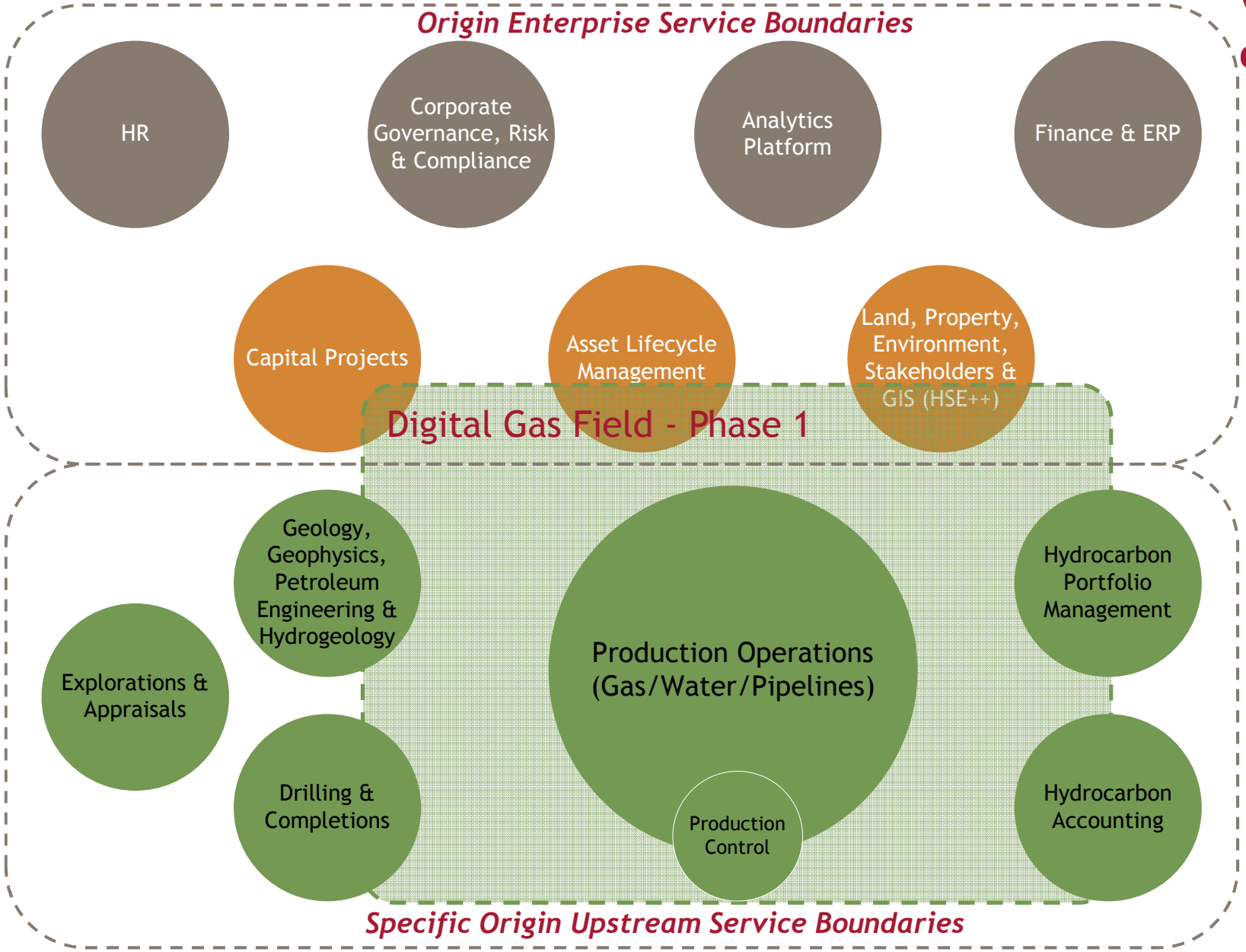
Integrated Operations & Origin QLD CSG

One of the key initiatives identified to provide foundational capability for IO was the Data Consolidation & Reporting (DCR) project. The project sought to introduce a new technology platform to aggregate or consolidate integrity-assured, best available data from disparate sources to:

- Transform data **to actionable information** to empower a rapidly scaling CSG Operation
- Be a **foundational enabler** for Integrated Operations
- Support a **centralised operating model** for APLNG Upstream assets
- **Standardise & automate** processes for APLNG Upstream asset reporting
- Facilitate a **sustainable and agile** platform for increasing the value of data as a key business asset
- Enable a collaborative environment that promotes an information driven culture combining analysis with judgement for improved decision making
- **Support increased production** and a **safer workplace** for our people

Technology enabled project intended to bridge the OT divide and present data from digital field based assets into an effective, accessible self-service solution for data visualisation, monitoring, informational, analytical and decision making purposes.

Sphere of Influence of IO Transformation



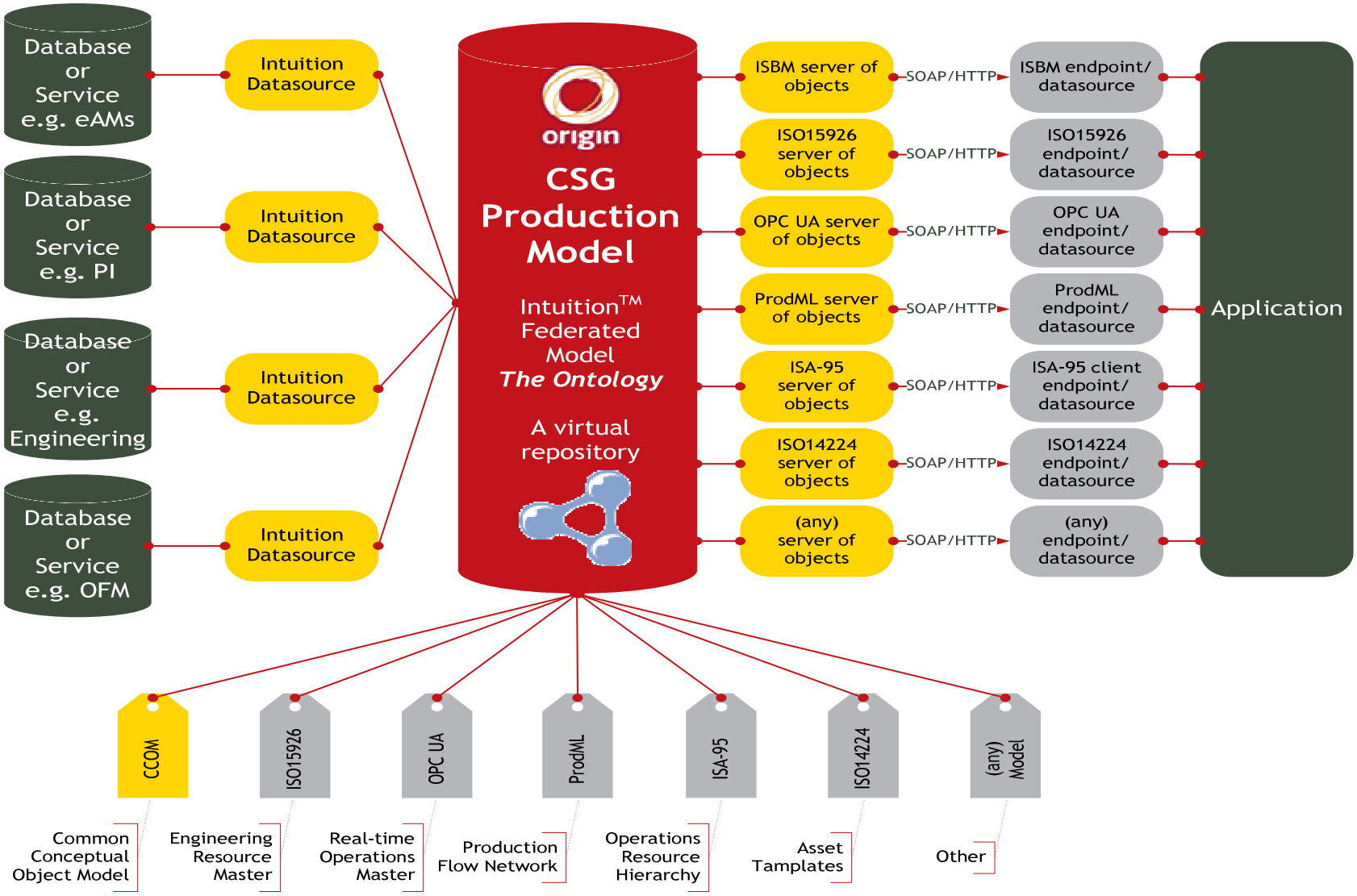
Operational Challenges

- Cohesion & collaboration
- Change management
- Data as an asset
- New concepts
- New technology
- Intellectual property loss
- Project & operational agility
- Rapid growth
- Steep Learning Curve
- Sustainability
- System positioning

The Technology Imperatives

- Establishing foundation frameworks for Origin CSG IO
- Forward facing position
- Delivering a single version of the truth
- Promotion templates & standards i.e. re-use don't reinvent
- Scalability
- Commercial Off The Shelf (COTS)
- ROI based on TCO & operational cost savings

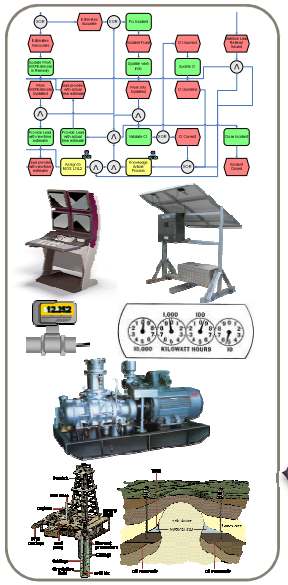
Production Data Model Ontology Based on Industry Standards



Technology Architecture

Common Navigation to multiple sources of production and operational data

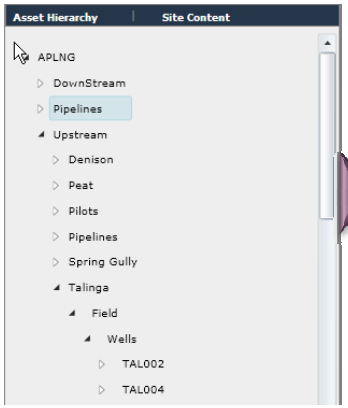
Business, E&P & Real-time Process Data



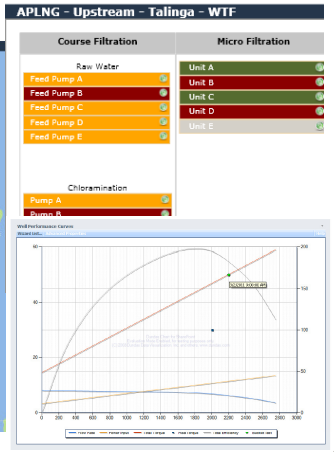
Present

Present and collaborate across functions and COE
SharePoint Portal, Presentation Webparts, KPI Dashboards

Common Navigation



Configurable User Views and Dashboards



Contextualize

Contextualize via data models

Analyze

Analysis, Reporting & Process Data Mining

Orchestrate

Workflow & Integration Services

Semantic Model

Federator

Calculations

Alarm and Events

Validation

Workflow

Data Services

Notification Service

Measure

Measure your business by capturing events, data, documents through federated approach

Historian

Alarm Manager

Downtime Reporting

Asset Maintenance

Document Repository

Well Attributes

HSE Systems

Production Systems

Other

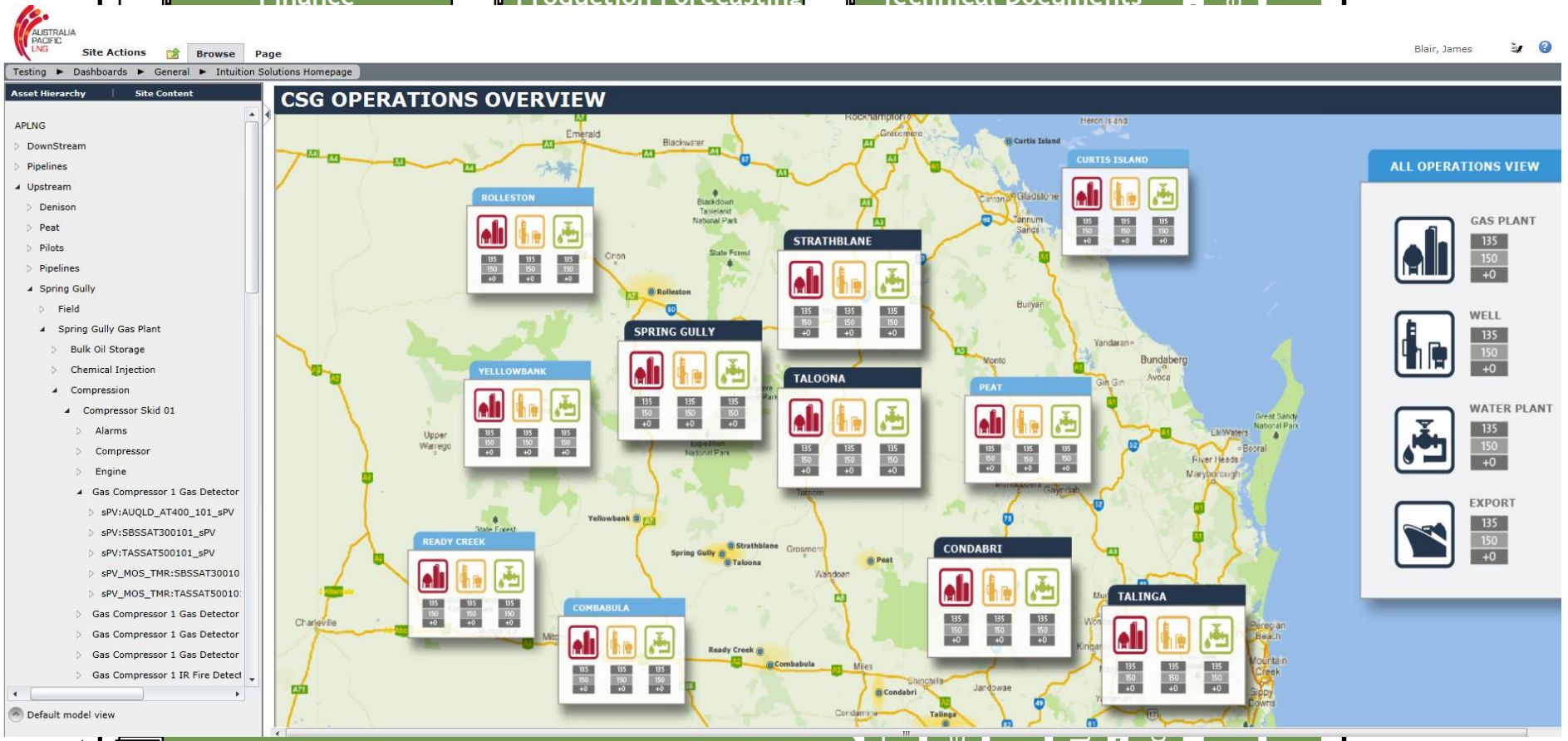
Digital Gas Field - Phase 1

Strategic

Corporate Domain

Environmental | Risk | Maintenance

Finance | Production Forecasting | Technical Documents



Tactical

Production Wells

Drilling & Completions

Future Perspective : Digital Gas Field - Phase 2 & Phase 3

Phase 2 - Targeted at New APLNG Infrastructure

Strategy

- Debottlenecking
- Commissioning Support
- Establishing Operating Recipes
- Jogging Flow
- Finding True Battery Limits
- Well Consolidation Based on Actual Flows

Objectives

- Manage Dewatering
- Maintain Flow & Enable Dynamic Field Turn Up/Down
- Exploit Spot Market
- Reduced Well Drilling Profile

Phase 3 - Targeted at Steady State & Optimisation

Strategy

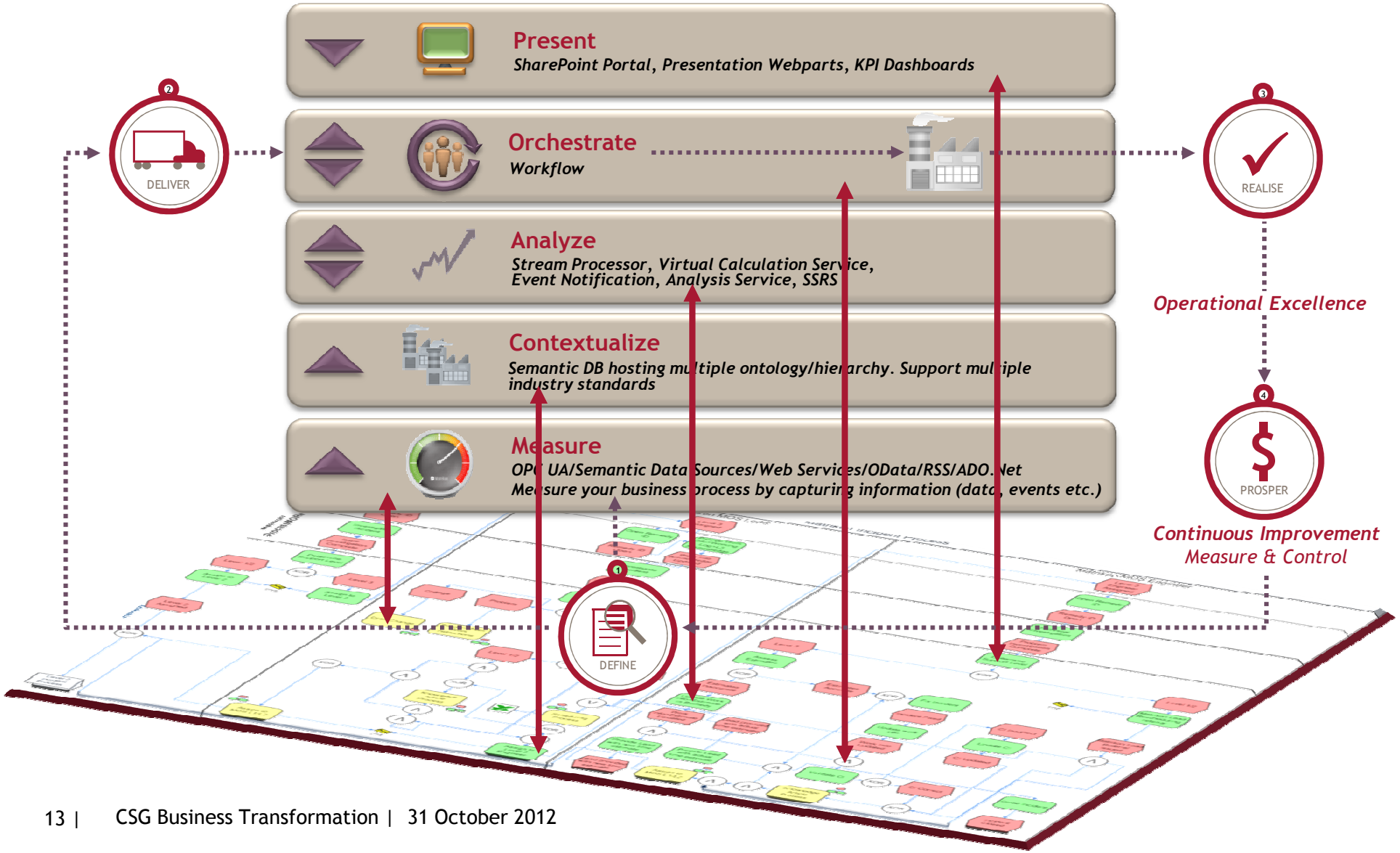
- Establish Steady State Recipes
- Manage Process Interfaces
- Manage Planned & Unplanned Outages
- Manage Value Chain Integration

Objectives

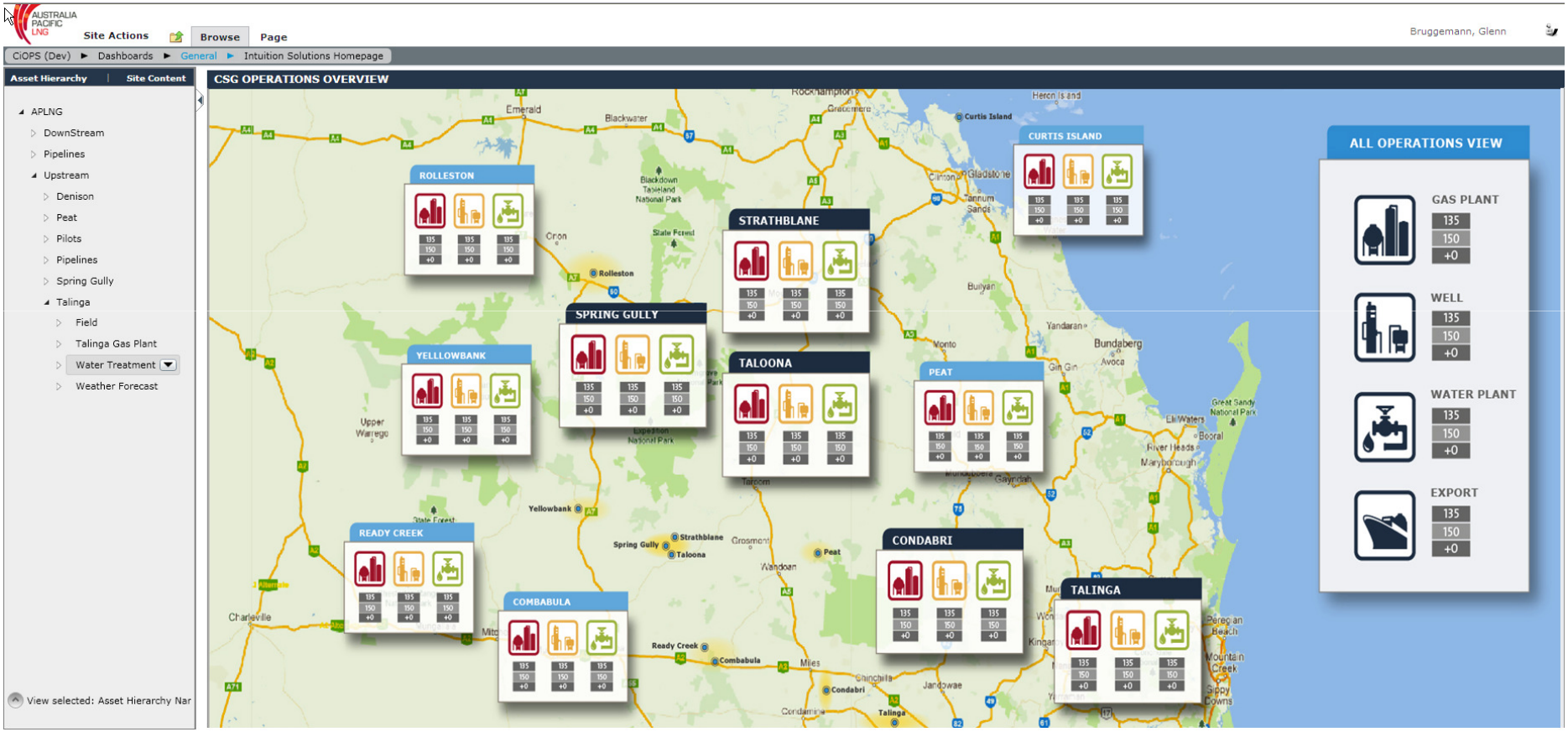
- Maintain Pipeline Pressures
- Maintain LNG Plant Pressures
- Manage Flow Through Major Shuts
- Reduced Well Drilling Profile

Summary

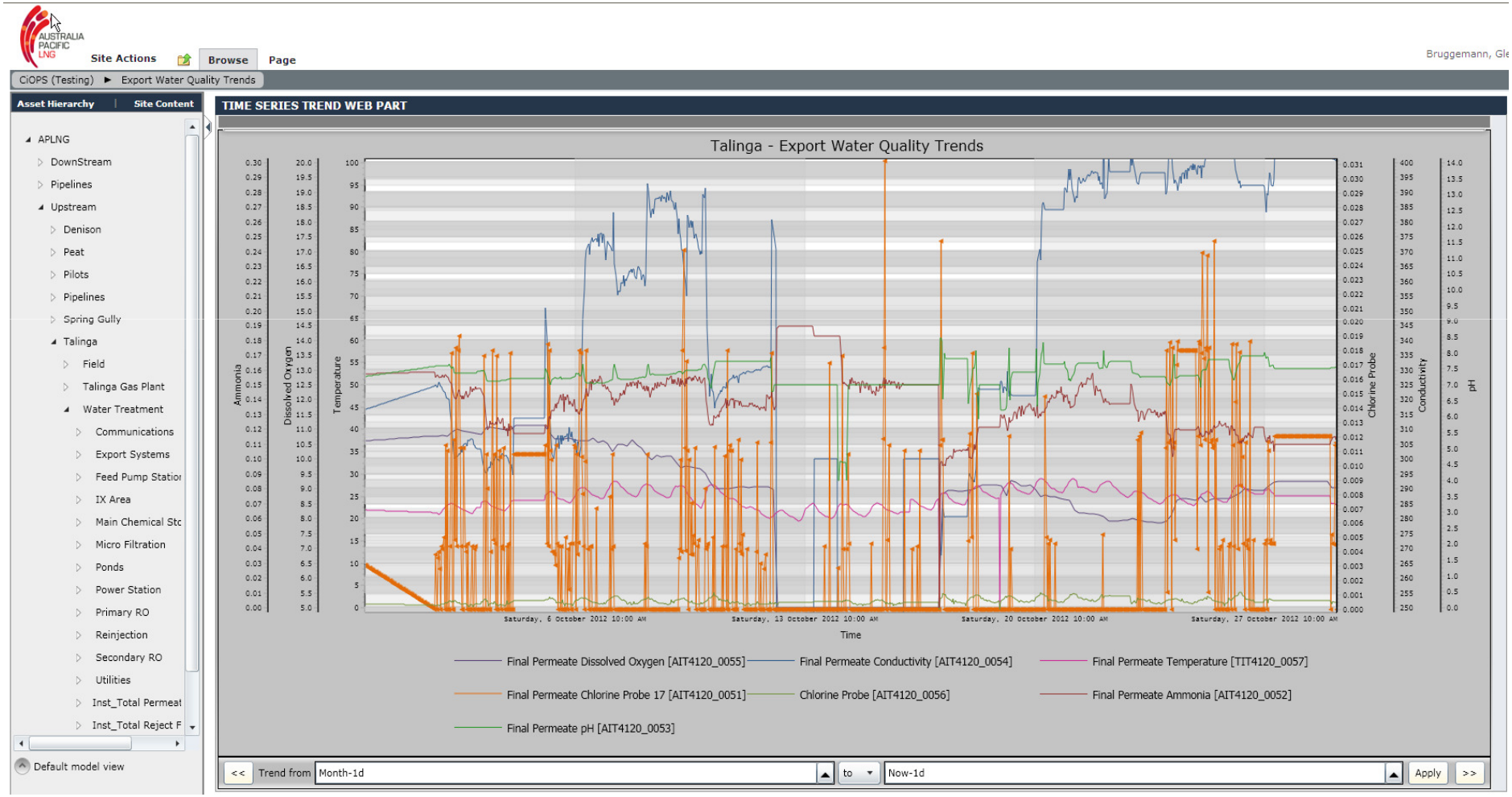
As a safer, more reliable, more efficient and decisive operator, Origin QLD CSG is well into the journey of achieving its vision of becoming *'A world leading CSG business from a world class resource'*.



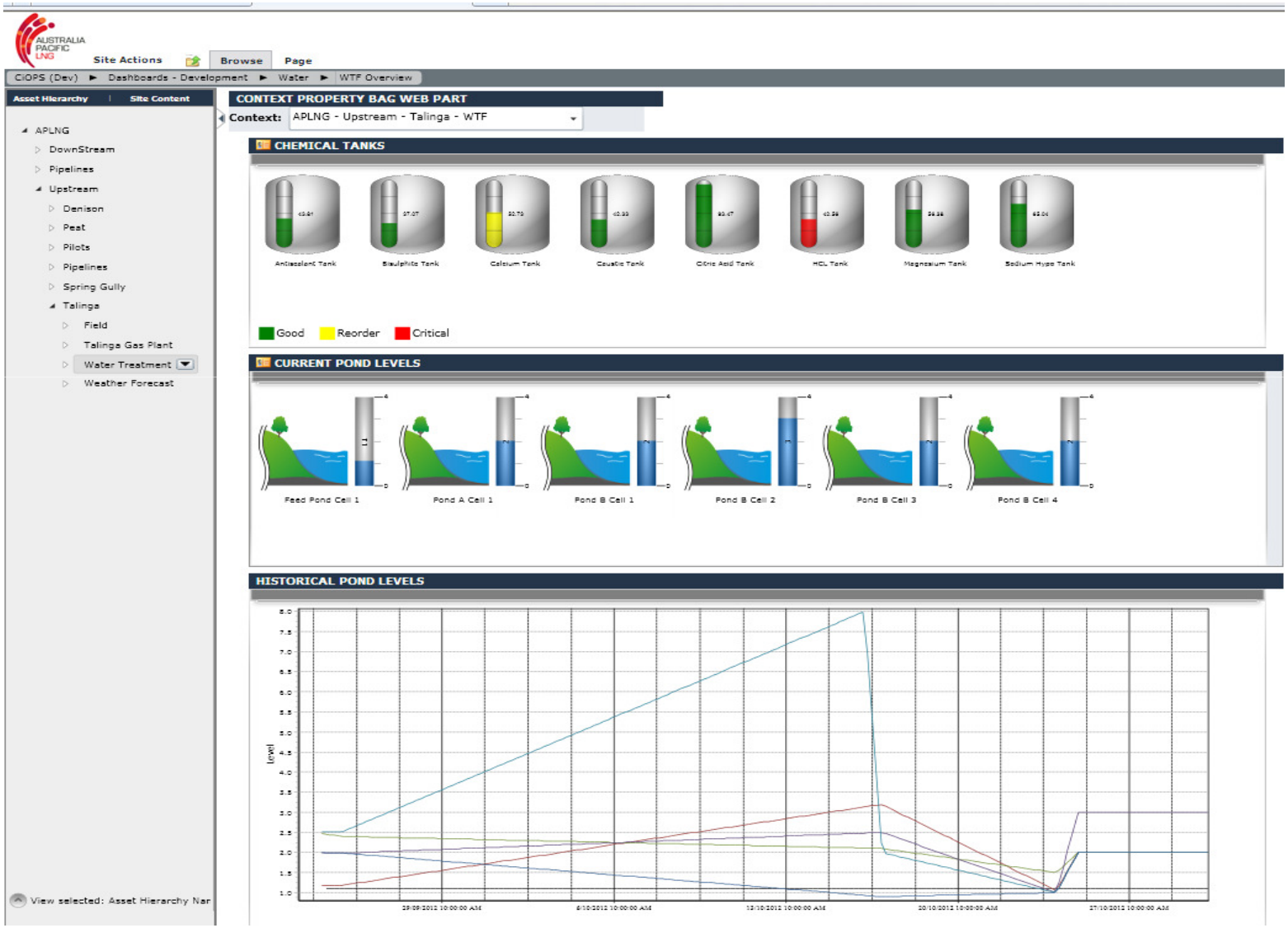
Home Page


AUSTRALIA PACIFIC LNG
Site Actions
Browse
Page
Bruggemann, Glenn
CiOPS (Dev) ► Dashboards ► General ► Intuition Solutions Homepage
Asset Hierarchy
Site Content
APLNG
DownStream
Pipelines
Upstream
Denison
Peat
Pilots
Pipelines
Spring Gully
Talinga
Field
Talinga Gas Plant
Water Treatment
Weather Forecast
View selected: Asset Hierarchy Nar
CSG OPERATIONS OVERVIEW
ROLLESTON
YELLOWBANK
SPRING GULLY
STRATHBLANE
TALOONA
CURTIS ISLAND
PEAT
READY CREEK
COMBABULA
CONDABRI
TALINGA
ALL OPERATIONS VIEW
GAS PLANT
WELL
WATER PLANT
EXPORT
135
150
+0

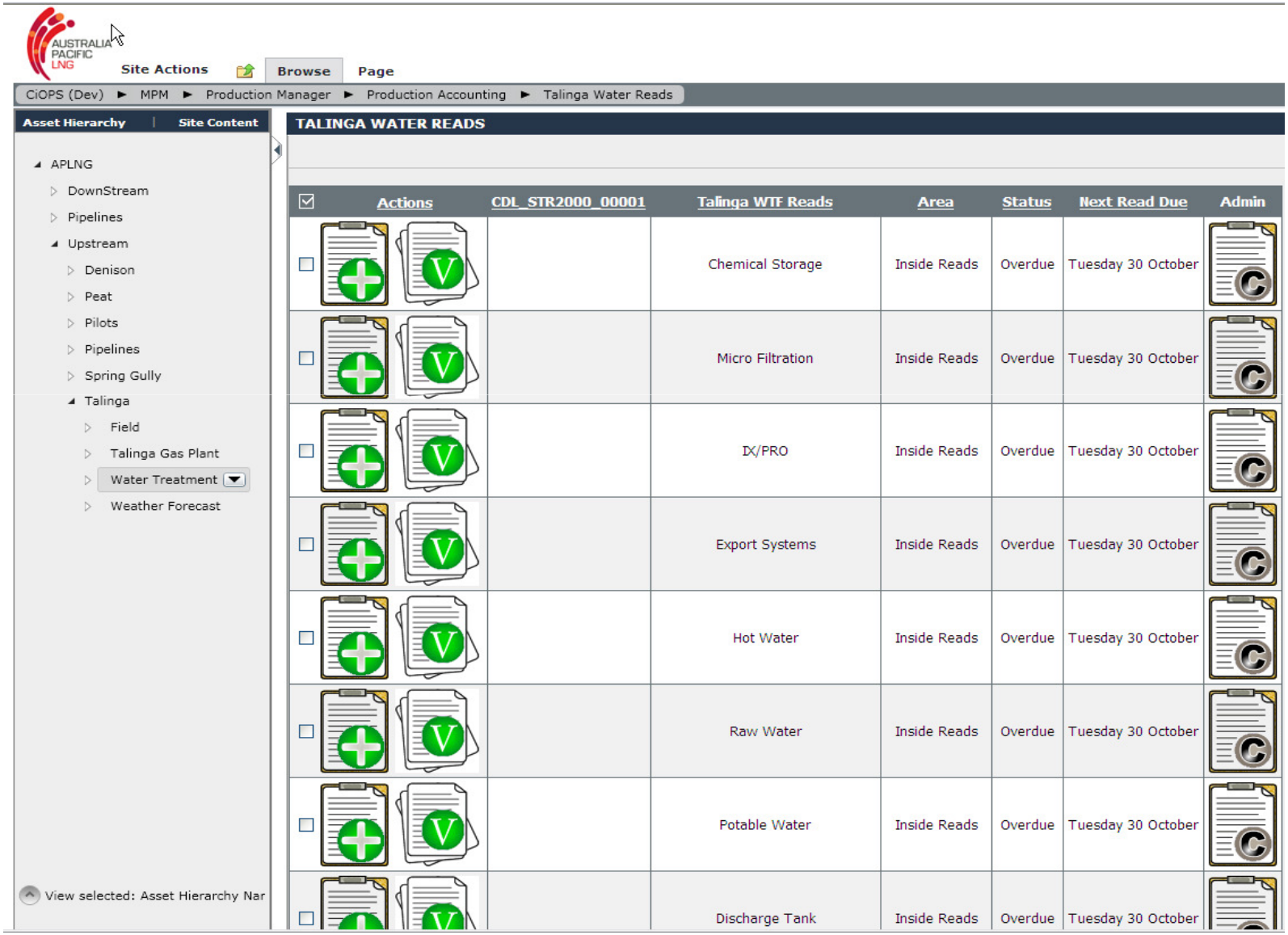
Pre-Configured Trend



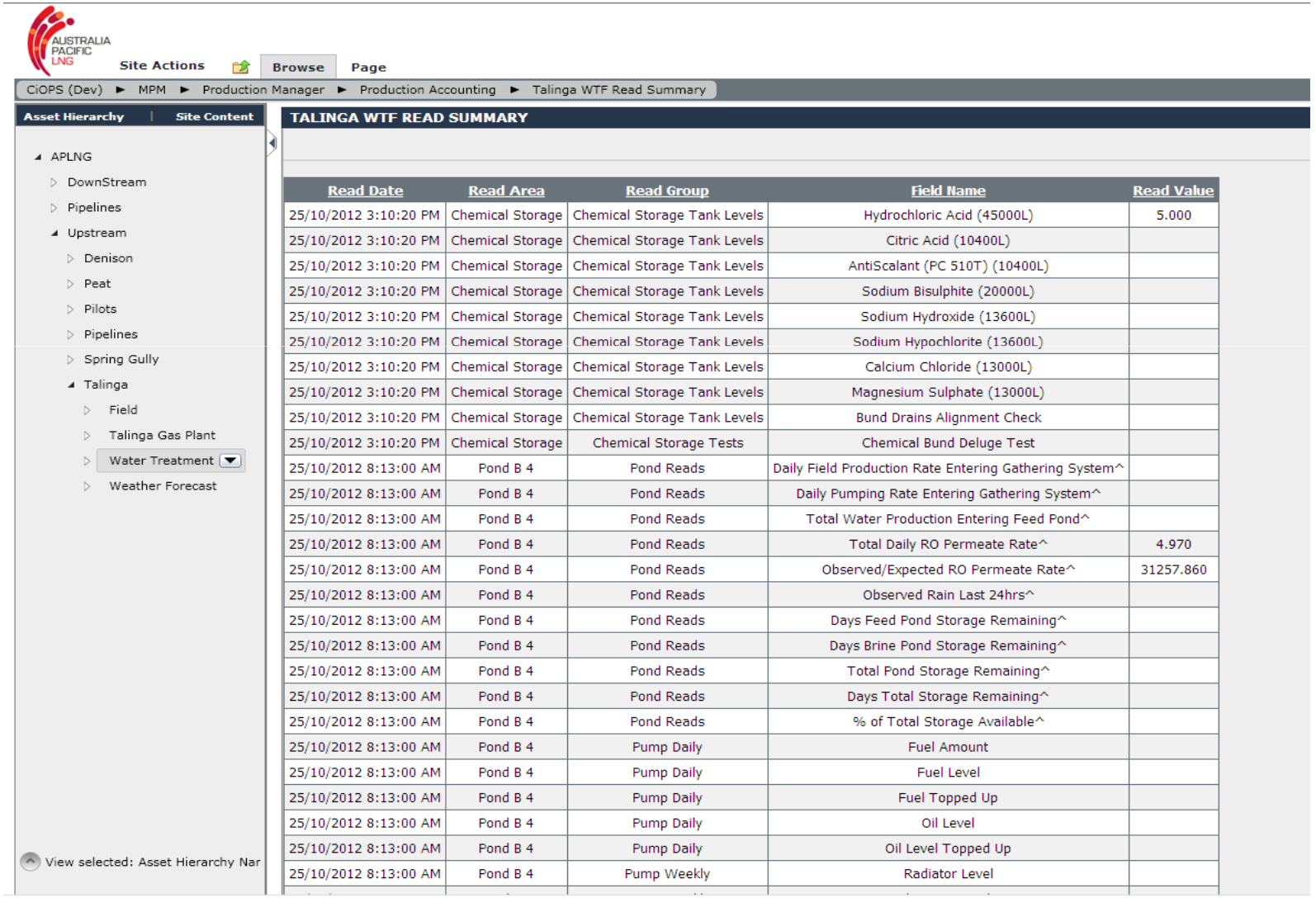
Water Overview



Tablet Based Manual Entry



Manual Read - Data Grid



TALINGA WTF READ SUMMARY

Read Date	Read Area	Read Group	Field Name	Read Value
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Hydrochloric Acid (45000L)	5.000
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Citric Acid (10400L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	AntiScalant (PC 510T) (10400L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Sodium Bisulphite (20000L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Sodium Hydroxide (13600L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Sodium Hypochlorite (13600L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Calcium Chloride (13000L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Magnesium Sulphate (13000L)	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tank Levels	Bund Drains Alignment Check	
25/10/2012 3:10:20 PM	Chemical Storage	Chemical Storage Tests	Chemical Bund Deluge Test	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Daily Field Production Rate Entering Gathering System^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Daily Pumping Rate Entering Gathering System^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Total Water Production Entering Feed Pond^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Total Daily RO Permeate Rate^	4.970
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Observed/Expected RO Permeate Rate^	31257.860
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Observed Rain Last 24hrs^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Days Feed Pond Storage Remaining^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Days Brine Pond Storage Remaining^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Total Pond Storage Remaining^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	Days Total Storage Remaining^	
25/10/2012 8:13:00 AM	Pond B 4	Pond Reads	% of Total Storage Available^	
25/10/2012 8:13:00 AM	Pond B 4	Pump Daily	Fuel Amount	
25/10/2012 8:13:00 AM	Pond B 4	Pump Daily	Fuel Level	
25/10/2012 8:13:00 AM	Pond B 4	Pump Daily	Fuel Topped Up	
25/10/2012 8:13:00 AM	Pond B 4	Pump Daily	Oil Level	
25/10/2012 8:13:00 AM	Pond B 4	Pump Daily	Oil Level Topped Up	
25/10/2012 8:13:00 AM	Pond B 4	Pump Weekly	Radiator Level	

Thank you