CABOT

CABOT CARBON LTD
SULLY MOORS RD
SULLY
VALE OF GLAMORGAN
CF64 5RP

ENVIRONMENTAL PERMIT BU2110IS
FUGITIVE EMISSIONS
ANNUAL REPORT CY2014

19th March 2015

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Introduction
Cabot Carbon Ltd is required to undertake an annual review of fugitive emissions at the installation in accordance with their Environmental Permit BU2110IS, requirement 4.1.4, which specifies:

"The Operator shall review fugitive emissions, having regard to the application of Best Available Techniques, on an annual basis, or such other period as shall be agreed with the Agency, and a summary report of this review shall be sent to the Agency detailing such releases and the measures taken to reduce them within 3 months of the end of such period."

The CY 2014 fugitive emissions report addresses fugitive emissions from the permitted installation to air, water and land, having regard to best available technique (BAT) and the measures taken by Cabot Carbon Ltd to reduce them. This year the analysis and trending of fugitive emission data has been included in this report. The Annual Fugitive Emissions data table CY 2014 is also attached for reference.

Highlights:

Table 1

Summary	**2014**	**Form**
Fumed Silica	18	Solid
HCL	17	Liquid
Oil	5	Liquid
Hydrogen	4	Gas
AHCL	3	Gas
Sodium Hydroxide	2	Liquid
Solvent	2	Liquid
Chlorosilanes	1	Liquid
Water treatment Chemical	1	Liquid
Resin	1	Liquid
Total	**54**	
Grand Total (kg)	**572**	
Operating Hours	6788	

There were no fugitive emissions reportable to NRW in the year 2014. The standard reporting index (SRI) method for determining reportability to the NRW was utilised on only two occasions (Silica leak on pipeline transfer and caustic storage tank leak) and all 54 events categorised as low significance.

In 2014 there were 54 releases across 10 categories totaling only 574 kg, compared to 2013 where there were 30 releases across 8 categories, totaling 1,524kg. There was only 1 event from 54 where loss of containment quantities were in excess of >400 kg (Caustic).

The highest number of reported events were through loss of containment of fumed silica (18 events, 14 from tanker filling operations), aqueous HCL (17 events) followed by Oil (5 events), H2 (4 events) Anhydrous HCL (3 events)

Fugitive Release Breakdown:

Type of Release	No. of events	Quantity kg
Caustic	2	460
Silica	18	57
H2	4	34
Solvent	2	10
Water Treatment	1	5
HCL	20	3
Oil	5	2
Resin	1	1
Chlorosilanes	1	0.03
Total	54	572

HCL Aqueous

There were 17 internally reported releases of aqueous HCL. (Concentration 26- 32% HCL-9 events, 19% HCL -5 events, 1% HCL-1 event and Anhydrous HCL condensed- 2 events, ANH HCL vapour -3). These were very minor in nature (no single event >0.2kg). 6 from the 17 were reports of signs of weeping or staining around bolts, other LOC were from wisp and pinhole leaks and all aqueous leaks were contained in secondary containment bunds. These were reported largely as an outcome of routine outside inspections and general observations by the Operations Team. T3 adiabatic tower was replaced in March 2014 (Purpose: to absorb hydrogen chloride vapour in the off-gas from the FMO silica manufacturing process in order to manufacture strong (~32% HCL). Investigation of the occasional droplet leaks found that there was a failure of the scarf joint in rubber lining (this allowed a leak path). Further root cause investigations found a manufacturing defect in the rubber lining which has since been rectified in the replacement column. The total LOC of HCL was only 3kg across the 17 reported losses in 2014.

Fumed Silica (Powder)

There were 18 events of Silica powder releases in 2014 totaling 57kg. 15 events were in outside areas and 3 reported as releases within the process building. Tanker loading operations featured as the most common failure mode (14 events). These losses were again very minor in nature and released onto the hard –standing containment areas on site and represents loss of containment in only 2% of the total tanker loading activities. We have continued to work with the existing haulier (Broekema) to improve service provision but in 2015 Cabot Barry will move around 20% of the tanker transfer business to a new haulier.

The largest release was a fumed silica leak and was attributed to a failure in the silica transfer pipeline. Approximately 30kg lost to ground (dusting on ground, pipe rack, foliage and chippings). The Spillage and Release Index was referenced to assess the severity of the release and the event was calculated as non-reportable to the NRW. The area was cleaned up and the root cause of the event found to be failure of pipework due to UV attack. A £22k Pipework Replacement programme has been proposed and awaiting approval for commencement in June 2015.

Caustic Liquid Leaks

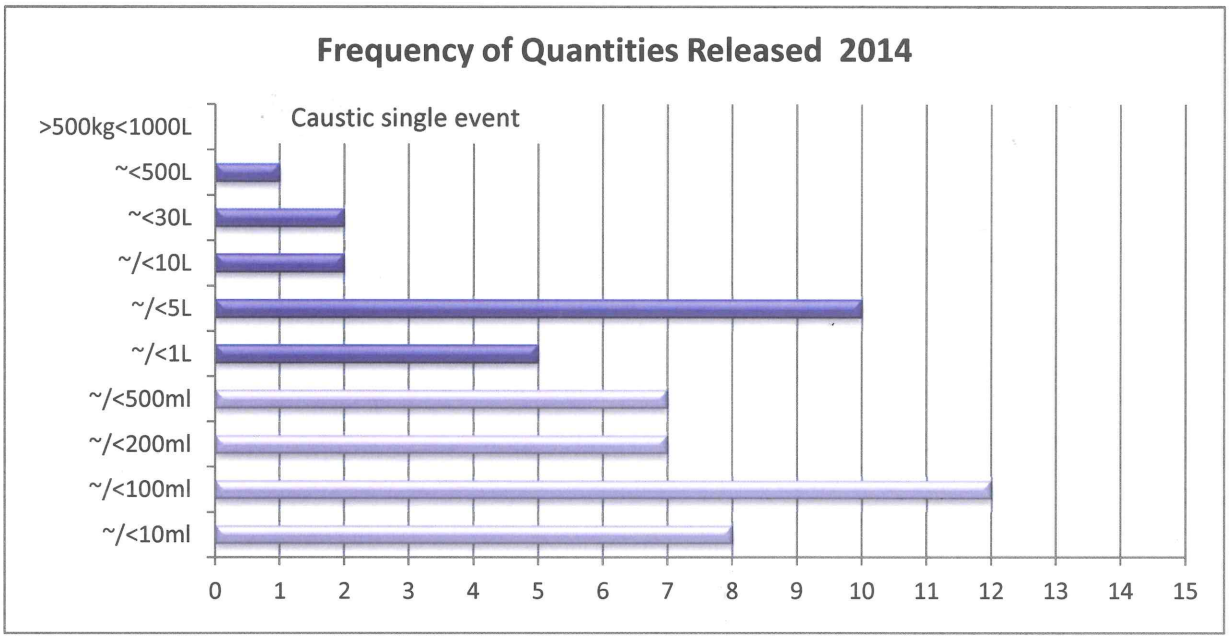
The largest single event in 2014 was a caustic leak on a storage tank recirculation line at the orifice plate section. The area was taped off, pumps shutdown and system washed for maintenance. The SRI Index was referenced to determine if the release was reportable to the NRW. (Release substance hazard factor: Corrosive =10, Scale of Release 300-1000 litres/kg =5, Fate of Release: Secondary containment =1, Calculation of release of 455kg = 50. SRI of 200-300 (or above) is reportable to NRW). This case was assessed as not reportable to NRW. The released caustic was contained within the bunded area, drained into the tank farm sump/waste collection system. The pipe previously suffered pinhole leak on same elbow on 1/9/09. Corrective Action: Pipework was replaced but due to repeat event, the jet impingement from the orifice plate upstream seems the most likely root cause. Completed Actions: The orifice plate has been relocated downstream of the elbow on the dipleg into the tank.

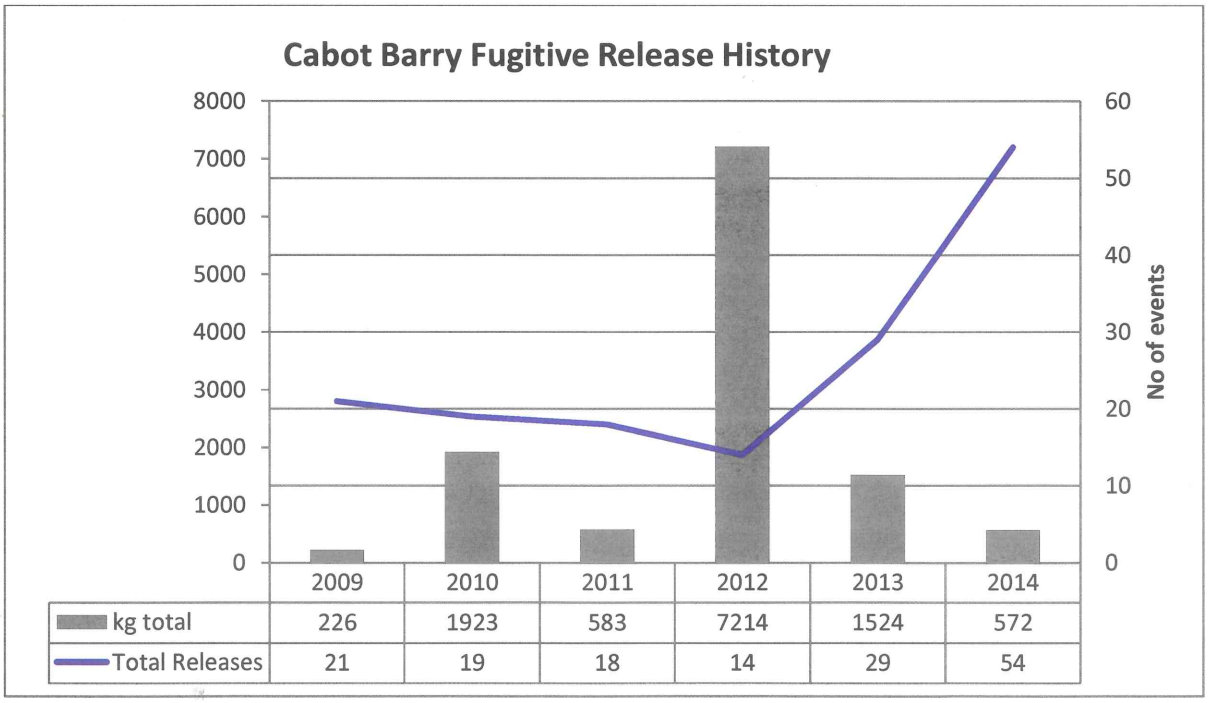
Gas Releases

H2 releases featured in 2014, totaling 24 kg in only 5 events. Root causes related to improvements being identified in preventative maintenance and these have been implemented. AN up-rated seal set is due to be fitted June 2015 to H2 VI regulators.

Primary Root Causes

Primary Root Causes	2014	ANH/HCL	Silica	Caustic	Oil	H2	Solvent	FSK	Resin
Equipment Malfunction	9	3	3		3				
Improper or inadequate Maintenance	21	11	1	1		4	2	1	
Lack of skill/knowledge	1	1			1				
Design	10	4	4	1		1			
Failure to follow procedures	12	1	10						1
Inaequate training	1				1				
Total	54	20	18	2	5	5	2		1

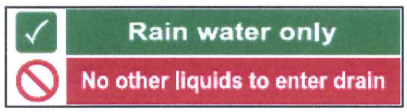

Frequency of Quantities Released 2014
Caustic single event
>500kg<1000L
~<500L
~<30L
~/<10L
~/<5L
~/<1L
~/<500ml
~/<200ml
~/<100ml
~/<10ml
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15


Cabot Barry Fugitive Release History
8000
7000
6000
5000
4000
3000
2000
1000
0
60
50
40
30
20
10
0
No of events
2009 2010 2011 2012 2013 2014
kg total 226 1923 583 7214 1524 572
Total Releases 21 19 18 14 29 54

Summary

We continue to apply the following measures to minimise fugitive releases from our site:

- The use and availability of new spill protection equipment in dedicated locations to minimise environmental impact resulting from a spill. Kits are now tagged with emergency pulls and a robust audit programme is in place.
- Hazardous waste stored in UN approved containers in a dedicated covered bunded storage compound
- Comprehensive site housekeeping and audit programme
- A recently reviewed, extensive and robust inspection and preventative maintenance programme
- All contractors working on site undertake a comprehensive Site Induction that covers minimizing fugitive spills whilst working at the Cabot Barry facility.
- We continue to use visual aids as additional measures near storm water drain points as an aide memoire:



- **Cabot Barry Corporate Safety Audit**: The audit was conducted for 1 week by 6 auditors over 5 main topics in September 2014. Cabot Corporation's Audit Team is committed to providing systematic examinations and reviews of facility and business unit SH&E programs to determine their level of development and effectiveness in terms of achieving desired performance goals and objectives At the end, each area is assessed against a "traffic light" system and rated Red / Yellow or Green.

Audit Primary goals:

- In-depth review of conformance with Cabot's critical life safety standards (LSS)
- Review of the facility's other Cabot SH&E standards
- Assess the facility's regulatory compliance status against local SH&E legislation
- Provide the site with an objective assessment of SH&E performance against which future performance can be measured
- Where necessary, provide the site team with meaningful recommendations for closing audit findings
- Check for significant gaps in SH&E which may put people at risk, harm the environment or property/assets
- Verify closure status of findings from the 2010 SH&E audit

The outcome for Barry was as follows:

SH&E Programs

PROGRAM AREA	OPINION
Safety	●
Environmental	●
Process Safety Management	●
Health (Includes Industrial Hygiene)	●
SH&E Self-Assessment	●

Meets or Exceeds ●
Requires Some Improvement ▼
Requires Significant Improvement ⬢

Total # of Findings = +/- 12

Stoplight Report Opinion Drivers

Environmental

- Excellent record keeping
- Strong technical and regulatory knowledge
- Waste and spill management improvements

Safety

- Very good buy in from employees
- Supervisor line ownership evident (SHE Leadership)
- Excellent PPE compliance
- Good LSS programs

Health / Industrial Hygiene

- Good relationship with medical and IH providers
- Clean facility

There were approx. 11 *Findings* (i.e. non conformances) and a number of *Local Attention Items* (i.e. observations). All the Findings have been classified as "LOW" significance, meaning that whilst detected during the audit, they do not represent a significant risk to people, the environment or regulatory non-compliance. The overall outcome was very positive result in that in all the 5 major areas of the audit we have been assessed as being in compliance to a very high standard.

- The dynamic incident reporting system (Intelex) introduced at the end of CY12 is firmly embedded into Cabot Barry and has been instrumental in the proactive reporting of environmental near misses and events. The reporting culture has further matured and is reflected in the total number of incidents reported in CY14 along with effective corrective actions.

- We continue to take the learnings from every incident and share what we have learned across the entire network of Cabot facilities. There have been no other notable reported fugitive releases during the reporting period that warrant further comment.

Summary	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**Form**
Fumed Silica	8	5	3	7	9	18	Solid
HCL	1	6	9	4	10	17	Liquid
Oil					3	5	Liquid
AHCL	5	3				3	Gas
Hydrogen	2		1	1		4	Gas
Sodium Hydroxide	4	2			1	2	Liquid
Solvent						2	Liquid
Chlorosilanes			1			1	Liquid
Water treatment Chemical		1			3	1	Liquid
Resin						1	Liquid
Diesel			1	1	2	0	Liquid
Natural gas	1		2		1	0	Gas
Formaldehyde			1	1		0	Liquid
Glycol		1				0	Liquid
Waste Water		1				0	Liquid
Mild Caustic (Construction Materials)			5	5	1	0	Solid
Total	**21**	**19**	**18**	**14**	**29**	**54**	
Grand Total (kg)	***226***	***1923***	***583***	***7214***	***1524***	***572***	
Operating Hours			*5968*	*5678*	*6651*	6788	

***** Cabot Barry: 1606 days since last ENC (19th March 2015) *****

End.

Incident ID #	Incident Date/Time (mm/dd/yr)	Spill Substance	spill Kg	Description	RCA/Measures Taken	Primary Root Cause
28996	12/31/2014	HCL 19%	0.1	ASH alarm AI-026 Tank Farm East blipping in and out of alarm. On investigating a very slight acid leak was evident coming from the body of P-27 B 19% HCL discharge valve. P27- B shutdown and isolated, area washed down and pipework/valve flushed with water.	Mechanical Seal replaced	Equipment Malfunction
28976	12/30/2014	ANH HCL	0.1	Outside man was on his walk found the PRV line from D-36 was leaking some HCL gas. He reported it to the SM, who went to investigate. SM called panel op to offload desorption.	Leaf line from D36 to PRV whisping ANH HCL. New section of pipe fitted	Maintenance - Inadequate or improper Maintenance
28462	12/11/2014	H2	0.1	During PM inspection, I/E Tech detected hydrogen leaking through the tell-tale ports on both VI Regulators (A-Side: PCV-8899, B-Side: PCV-4025) using both an MX6 & a Micro Clip gas detector.	Temperature rating of seals specified & installed is insufficient (70'C max verses, 90'C process temperature).Actions|; Arrange for both valves to be greased in-situ in an attempt to reseal the valve stems, determine when PCV-4025 can be removed from service, Confirm process specification for VI regulators is correct (mainly materials of construction & temperature rating). Valve max design temperature is 70'C. System runs nearer 90'C & so is a likely root cause of repeated O-ring failure. Action: up-rated seal set to be fitted at next overhaul (June 2015)	Inadequate design-engineering
28433	12/10/2014	HCL 32%	0.01	Whilst carrying routine plant inspections it was noticed that there was a slight HCL leak on the inspection hatch of GB16 which in turn was causing some corrosion to both the cover plate and a couple of bolts. Further inspection was undertaken by the Operations Manager, Shift Manager and Senior Reliability Engineer and the decision was taken to shut the plant down in a controlled manner to enable further investigation. Please note the loss of HCL was minimal with only a few drips being evident. Closing report Iorwerth Griffiths working on issue from previous report PJM 11/12/2014	Failure of rubber lining allowing ANH HCL to be released. New blank installed and replacement rubber lined hatch fitted in June Shutdown 2015.	Equipment Malfunction
28207	12/03/2014	ANH HCL (Wet)	0.01	During plant checks noticed that there was signs of corrosion from beneath a bolt on GB-16 inspection hatch. Informed SM and requested a Maintenance Tech to check hatch. Several bolts on the hatch were found loose due to the PTFE lining softening, these were tightened which stopped the leak. Area beneath Fan cordoned off as a precaution. Maint Tech and Outside Op monitoring the hatch on a regular basis. Work Order #3772577 raised. OGP 1 & 3.	Bolts pulled up, maintenance to confirm torque settings. This was a re-sited blower from a previous plant position. Had visuaul inspection: no failure. Learnings: Integrtiy inspection of lining to include rubber spark test.	Maintenance - Inadequate or improper Maintenance
27956	11/24/2014	Silica	30	At 04:55 W-115 Supervisor(DCL) contacted the duty Shift Manager, to report a Silica leak from the transfer line from Cabot to W-115. On investigation the Silica line on the 45 degree bend prior to crossing the DCL fence line has failed. Please see attached Photo. Blow egg immediately isolated, and area cordoned off. Lagging will have to be removed from section of pipe work to see where leak has came from.	Approx. 30Kg loss to ground (1cm high dusting on ground, pipe rack, foliage and chippings). SRI Index calculates incident as non-reportable to Agency. Area cleaned by contractors. Failure of pipework due to UV attack. £22k Replacement programme submitted for approval for June 2015 shutdown.	Inadequate design-engineering
27769	11/17/2014	Oil	0.2	Vacuum tanker used by contractor dripped oil/diesel onto site roadway when parked in front of the Acid Area during the work to clear out the Waste Water Tank, D-14. As the road was raining & the road wet, the slick was clearly visible. (note: oil absorbent pads were used to contain the drip & clear up the road before reaching any storm drain, <0.2L spillage)	Area cleaned no further issue.Notice sent to Contractors	Equipment Malfunction
27707	11/10/2014	H2	0.1	Whilst completing P&ID checks, leak heard from valve V-22 stem. Tested with a Microclip gas detector which instantly alarmed for high CO & %LEL at approx. 0.5m from valve (hydrogen is misreported as CO in these devices). Valve handle rotated back & forth several times in an attempt to move gland packing to reseal the valve which vastly reduced the leak to barely audible.	No record of overhaul or repacking. Valve service interval is far shorter than D-146 inspection interval - on next D-146 inspection, valve design spec could be improved to meet vessel periodicy.	Maintenance - Inadequate or improper Maintenance
27445	11/05/2014	H2	10	I/E tech was working in the B4 Abatement area with a personal O2 monitor, the monitor started to alarm CO, the I/E tech immediately contacted the permit office and reported the issue. Outside operator took another meter and started to investigate the possibility of H2 leak which is picked up as CO. The VI valve port was found to be venting, which indicated the valve needs to be replaced. B4 offloaded and is currently having a spool piece to replace the regulator. MOC-1254 raised to run without the regulator.	Regulator has been in service for over 2 years & has not been maintained as per the manufacturer's recommendations leading to failure of an O-ring seal. LOC approx. 0.9-1.4kg/hr. (0.18L/s) based on the stem O-ring fragmenting & completely falling away from it's location recess leaving no stem seal. Action: 1) Follow manufacturer's O&M instructions to prevent premature failure of components 2) Generate JDE WOs for routine maintenance as per the manufacturer's recommendations.	Maintenance - Inadequate or improper Maintenance
27286	10/31/2014	HCL 32%	0.2	Staining evident on ground floor of bunded Tank Farm (near North Wall) indicating a possible leak from 32% return to D30 flange/line on gantry near fin fans. On inspection in day light hours, we do have a small leak passing through the flange.	Area cordoned off and shift are monitoring. Approx. estimation of loss to containment = 0.2l. Repaired during downtime opportunity Nov 14: New joint replaced. Lack of maintenance, slackening of flange over time.	Maintenance - Inadequate or improper Maintenance
27189	10/28/2014	Silica	0.2	As a follow up on signs of powder leaks through the rubber sleeve of Larox valve, beneath TC3 silo building.	The sleeve was replaced with a new one. The removed sleeve was inspected and can see obvious locations of failures and obvious marks of detrition in the rubber which could be related to age or high temps. New Action: New type of hose with new specification has been recorded and placed on stores stock. Maintenance Plan reviewed and exchange frequency increased.	Inadequate design-engineering

Incident ID #	Incident Date/Time (mm/dd/yr)	Spill Substance	spill Kg	Description	RCA/Measures Taken	Primary Root Cause
27070	10/23/2014	Silica	0.4	A build up of silica was noticed underneath XV-2473 vortex valve under TC-3. . A side is currently producing through TC-8.	A note has been raised to repair & casing will be removed to check source tomorrow. WO # 3750206	Equipment Malfunction
26982	10/21/2014	Silica	0.5	ABS pipeline from Denser JC-1 to Silo 3 has deformed, the pipe sockets have become detached and fragile, allowing a small amount of silica to leak onto the walkway. The pipeline was removed to replace the damaged section, but on closer inspection the remainder of the pipeline was deemed to be in a very poor condition and further failures were identified as a high possibility.	Capital project approved to replace pipeline with an upgraded spec from plastic to aluminium. 26 year old pipeline.	Equipment Malfunction:End of life
26730	10/12/2014	Silica	5	The loading of an FS tanker was being undertaken with the front hatch being closed at approximately 21:00hrs (probe was hit). After approximately 10 minutes silica was seen to be being emitted from the top of the tanker at the front.	The pumps were immediately stopped. On investigation a valve was found open on the tanker depressurisation system, this in turn was closed and loading completed.	Procedures-Failure to follow procedures
26629	10/08/2014	Silica	1	Whilst loading under pressure tanker loader radioed myself for assistance as the top rear valve of broekema 4651177 was leaking under pressure. Once there I had used the large red steps and vacuum hose to prevent powder from being exposed to the environment. once the pressure was released I had placed a top cap on the valve to seal it so the tanker can be finished. I would like to bring attention to the fact that I had the same issue with this exact tanker on the weekend which was reported and fixed only for the same tanker to be returned here with the fix that had been done on Saturday removed. Less than 1kg powder was spilled.		Procedures-Failure to follow procedures
26670	10/08/2014	Oil	0.5	During routine line maintenance it was noticed that there was a leak on the Hydraulic pack. The system was shut down and the vendor was called into site to repair. The repair was carried out and the system was reinstated. the area was covered with absorbent oil pads and cleaned up. The leak contents were contained in the area and estimated at 500ml	Cleaned up. Vendor came in to repair	Equipment Malfunction
26494	10/04/2014	Silica	0.5	During the early stages of pressurizing of a Broekema tanker (BKBU4651177) I noticed some powder just start to leak through the rear top valve. As soon as this was spotted I had shut the pumps off and use a suction hose to make sure that powder was kept to a minimum (much less than 1kg) once the pressure had been relieved and the leak stopped I had repaired and placed a top cap on the valve to ensure the tanker could be completed safely and to target weight.		Procedures-Failure to follow procedures
26385	09/30/2014	Oil	0.5	It was noticed there was an amount of oil on the floor to the rear of the compactor. The quantity was approximately 500 ml.	The floor area has been covered with oil absorbent mats and the supplier DM Recycling has been contacted and their engineer will call to site to repair today. On a Maint/Service Plan.	Maintenance - Inadequate or improper Maintenance
25851	09/09/2014	HCL 19%	0.2	19%HCL dripping from pump inlet flange to pump P-27B, which was off-line at time of incident. Informed shift manager, isolated and flushed pump, ready for maintenance to repair. Work order raised.	Drips into containment. Washed into waste collection/disposal system. Flange face reset with new gaskets.	Maintenance - Inadequate or improper Maintenance
25826	09/09/2014	HCL 32%	0.1	When opening valve to top up HCL Day tank in Demin plant, a number of small droplets on valve was found to be leaking.	Few drips to containment, washed into waste collection/disposal. Stopped task immediately and isolated line ready for maintenance. W/O raised	Maintenance - Inadequate or improper Maintenance
25714	09/02/2014	HCL 32%	0.01	Both drip legs from condensers in bunded acid area E-51 and E-52 are showing signs of heavy corrosion from the vent points (approx. 15mm) line No 2"-HCLV-3607/8-A1QX. Both require early replacement from the condensers through the liquid seal and onto D-27. These PTFE lined pipes are of the earlier type and without the vent point extensions and PTFE nipples which will help to prevent corrosion at this point. Unable to attach photo, originally, but are now attached	Permeated vapour from PTFE lining stains and corrodes external carbon steel pipework in a bunded area. Action: Pipework replacement plan and P&ID inspection programme for reactive engineering tasks under way.	Equipment Malfunction:End of life
25297	08/19/2014	Caustic	5	P-7A was found to have a small caustic leak to identified chemical protection area. On further inspection after removing the lagging the bowl had a small leak. The amount of flow was very small and was only noticeable as a small patch seen on the tank farm floor. 5 litres approx. The area was flushed down to the waste water pit.	Pump being changed, MOC required.	Maintenance - Inadequate or improper Maintenance
24976	08/08/2014	Chlorosilanes	0.03	When trying to sample the vapouriser no flow of N2 was observed going to the container, although there was a flow reading on the circuit. A sample bottle was in place & during the purge to the vapouriser ClSi flowed back into the bottle & overflowed as well as leaking out of one of the joints. Approx. 30 mls lost, contained within the vapouriser building. Work order raised to fix & clear pipework (3706971).	The sample system has been stripped down in the workshop and the field (attached is a summary of the items found) together with an explanation below. Actions: Mark up PID, carry out PSSR D-11 once re-instated as per D-5,Carry out a PHA study,re-training of sampling procedure.	Maintenance - Inadequate or improper Maintenance
24815	08/04/2014	H2	24	During DSEAR survey, audible leak noticed from PCV-8899, main H2 "VI conditioning" regulator for to A-Side. Returned with an Microclip gas detector which instantly displayed 100%LEL (& full scale CO which actually is H2 as the detector cannot distinguish between the two gases). Informed Shift Manager & shutdown A-side ready for purging & removing valve from service.	No environmental impact; leak stopped once A-Side burners were shutdown to mantle flame only. Open Action:1)Outstanding: DSEAR calculations & zoning info for failure within 2years - probable Zone 1 grade. Completed Actions: 2)Generate PM schedule for PCV-8899 with E&T support 3)Review installation of PCV-8899 for maintenance, e-isolation, etc & modify where applicable 3)Reinstall PCV-8899 once returned from Reliance Controls 4) Send PCV-8899 to Reliance Controls for failure report & overhaul in June 2015	Maintenance - Inadequate or improper Maintenance

Incident ID #	Incident Date/Time (mm/dd/yr)	Spill Substance	spill Kg	Description	RCA/Measures Taken	Primary Root Cause
24674	07/31/2014	Caustic 47%	455	Leak found on Caustic tank (D-13) recirc line at orifice plate section. Area taped off, Pumps shutdown and system washed for maintenance. SRI Index reference to determine if release reportable to NRW. Release substance hazard factor: Corrosive =10, Scale of Release 300-1000 litres/kg = 5, Fate of Release: Secondary containment = 1 Calc=50. SRI of 200-300 (or above) reportable to NRW. This case assessed as not reportable to NRW. The released caustic was contained within the bunded area, drained into the tank farm sump/waste collection system.	Pipe previously suffered pinhole leak on same elbow on 1/9/09. Pipework was replaced. Due to repeat event, jet impingement from the orifice plate upstream seems the most likely root cause. Completed Actions: The orifice plate has been relocated downstream of the elbow on the dipleg into the tank.	Inadequate design-engineering
24620	07/25/2014	Solvent	2.5	A 2.5L Glass Winchester containing mixed solvents (toluene/acetone/isopropanol) has cracked in half within the solvent shed over the weekend and the entire contents is contained within the metal shed bunding below. Respirators and chem suits will be required to clean/mop up the waste solvent.	The clip holding the shelf had rusted through/failed and caused bottle to crash against each other. The entire spill was contained within the cabinet, which sat on a containment bund. Action: Replaced Cabinet	Maintenance - Inadequate or improper Maintenance
24442	07/22/2014	Silica	4	A silica leak was spotted on the line to DCL over on the pipe bridge, just on our side of the fence line. Contacted W115 and informed them that we would be shutting down the transfer to them until a repair was complete.	Failure was due to the ABS socket glue erosion and is the 1st known failure on this line. There are some evidence on the socket joint of 'weathering' but the pipe structure on the removed section is intact. Inspections of this pipeline have been captured in the ABB mechanical integrity program for 2015.	Equipment Malfunction:End of life
24244	07/15/2014	HCL 1-2%	0.1	Weak acid 1-2% is drip leaking through the casing of P-18B Jet Washer Off-Line pump. heavy signs of corrosion are clear on the metal casing, base metal & plynth. This pump is on standby duty. Pump has been re-engineered and tested for required process flow performance.	Failure to operate the pump on a regular basis, allowing acid to attack the pump bowl. Run the pump set as a 'Duty & Standby' unit to achieve the run time for a PM service. Actions:Casing re-engineered and pump rebuilt by pump service contractor. Testing and returned to service. Replace obsolete pump during FY-15 maintenance budget.	Maintenance - Inadequate or improper Maintenance
24241	07/15/2014	HCL 46%	0.1	Line 2"HCL-3657-K4YX (GRP) 46% line to D-30 / 31 has developed a leak beneath the lagging between the two tanks. This is then dripping to bunded containment from the supporting angle iron bracketry. Reported to Shift manager and requested scaffold access to enable an assessment and repair.	Acid staining and pipeline shwoing signs of breakthrough in pipeline fibre make up. Some residue on outside of pipe but all within contained bunded area. New section replaced.	Maintenance - Inadequate or improper Maintenance
24197	07/13/2014	ANH HCL	0.1	Outside operator found the D-30 vac break nozzle to be wisping small amount of fumes. He radioed in to report this to his SM, who went out and investigated with him. Found that the GRP has cracked and is leaking small amounts of HCl fumes. Pictures taken. On Call Manager and Engineer notified. Work Order raised # 3692502	Root cause unclear for this failure, but contributory factors are: a) Stress fracture on GRP flange from previous PRV installation, creating a weak point in the GRP flange construction. b) No washers between GRP flange and bolt nuts, for even torque load distribution. Actions: Replacement nozzle fitted 18/07/2014 w/o:3692502. Action: I PRV's torque information to be provided from June 2015 on the PRV I/D tags (ref N.Richards)	Maintenance - Inadequate or improper Maintenance
23850	07/01/2014	ANH HCL	0.01	In preparation to send AHCL to DCL, it was noticed when checking the lines that there was a AHCL vapour leak coming from the inlet line into the Roots blower. Desorption boxed in and pressure in inlet line drained. Please see attached photo's. Blower tripped when boxing back in, and now won't start. Tried to free several times.	HCL corrosion on the carbon steel pipe. This pipe is suitable for -15 degrees C Ahcl but the pipe layout has a dead leg where there is a potential for Ahcl vapor droplets to accumulate during non production periods and corrode the pipe. Avoid dead legs when installing carbon steel pipe for this type of application. Also due to the plant thermal cycling allowing hcl to condense, install ptfe lined carbon steel or similar pipe. Action: Pipework repaired - line from D-36 to C-9A proposed change to PTFE lined from C/Steel pipe to be carried out Jne 2015. Blower mechanically seized due to ferric chloride build up on rotors - replaced. New spool installed. Pipeline x rayed as per ASME standard. I.Griffiths 9/01/2015	Lack of skill/knowledge.
23838	06/30/2014	Silica	2	Broekema BKBU 465111-4 was due to be loaded with M5 from a sea-bulk. As usual the driver had opened the rear hatch to allow inspection of the interior for moisture. The driver then closed the hatch and checked top hatches for tightness, however as soon as silica was introduced from the sea-bulk it became apparent that the rear hatch had not been tightened sufficiently. There was a slight delay in noticing the leak as the loader was the other side of the wall at the rear of the sea-bulk instead of the rear of the tanker. This was the first time we have offloaded M5 into a tanker.	This was an example of Broekema drivers not taking responsibility for their tankers. I have insisted on the re...oval of the spare Broekema unit and 2 tanks to stop the drivers just dropping off containers, this will ensure that they take ownership of the tanks they arrive with.Area was cleaned, hatch re-tightened and loading re-started	Procedures-Failure to follow procedures
23595	06/20/2014	Solvent	7.5	Chemical Spill of 7.5L Propan-2-ol in solvent shed occurred when a shelf clip failed and tipped glass Winchester bottles onto the floor. 3 x 2.5L Winchesters broken. Propan-2-ol immediately contained with chemical spill absorbent mats located near by and all broken glass removed from area and retained in lab sharps bin. Area now clean and free from flammables. All chem mats bagged off and stored within lab fume-hood while solvent evaporates. Waste stream TBA.	The clip holding the shelf had rusted through/failed and caused bottle to crash against each other. The entire spill was contained within the cabinet, which sat on a containment bund. Action: Replaced Cabinet	Maintenance - Inadequate or improper Maintenance
23246	06/10/2014	HCL 19%	0.01	Maintenance tech working in the area noticed a small weep from pinhole in the 19% Acid line to the adiabatic tower. Area was cordoned off. Plan is to shut down and replace a section of GRP. Difficult to quantify amount of acid as it was a small drip to the bund area.	Repairs completed.	Maintenance - Inadequate or improper Maintenance

Incident ID #	Incident Date/Time (mm/dd/yr)	Spill Substance	spill Kg	Description	RCA/Measures Taken	Primary Root Cause
23087	06/04/2014	Oil	0.2	Very small oil leak from expansion pot on diesel generator to the road way.	Generator was switched off the drains in the area were covered with spill kit blocking plastics pads. The oil was mopped up with oil spill kit pads.	Equipment Malfunction
23122	06/04/2014	Polyester Resin	1	Small amount of resin (<1litre) was spilt on the Roost building floor during the relocation of the resin materials.	Cleaned up and the waste bagged, labeled and placed in a drum ready for removal from site.	Procedures-Failure to follow procedures
22986	05/31/2014	Silica	0.5	During shutting B Train down on Saturday 31.05.2014, Silica was seen whisping from Fan GB-94 face plate section. Further investigations required during planned outage.	Flange gaskets were slackened- bolts re-set.	Maintenance - Inadequate or improper Maintenance
22077	05/02/2014	Silica	0.01	A Broekema tanker (BKBU 465112/0) had been partially loaded with M5 by the WPS daycrew and was handed over to complete when plant back in production. Tanker loading recommenced at 22:30 and the pumps tripped out at approx. 23:30 due to the LSH probe activating, the WPS tech went to close the front hatch and noticed a small amount (less than 10 grams) of silica local to the vent valve on the top of the tanker.	Attempted to tighten the valve but was unable too so the tanker loading was ceased until able to get support due to the requirement to pressurise the tanker for this grade.	procedures-Failure to follow procedures
21905	04/27/2014	Silica	1	Whilst manually sucking out the treated filter TF-121 due to the pumping system (P-179) being locked out, the treated sweeps system stalled coincidentally when TF-121 pulsed. This pushed an amount of treated silica out of the open vent at the base of TF-121. This resulted in silica covering an area of floor approximately 3m X 3m, estimated silica release <1kg.	The area was cleaned up.To prevent reoccurrence need to pipe the filter outlets directly into the sweeps line and control the filter emptying automatically via the DCS. Proposals to include in FY15-16 Capital Projects under consideration.	Inadequate design-engineering
21651	04/16/2014	Water Treatment Chemical	5	NALCO Tote containing NALCO 3DT265 was found to be empty. Level on the 14/04/14 was reported as 80L. A blue-ish, sticky residue could also be seen in the containment bund below the tote and around the pump. Further inspection showed fluid possibly leaking around the pump outlet line, where the outlet line connects to the plant dosing line.	Lack of PTFE thread tape/locking fluid used between process connection & PTFE tube connector when last changed. Thread worked loose as a result of pump oscillation (normal pump movement) leading to leak around threads. Action completed: - lines replaced in June'14 when Nalco storage tanks & pumps to be replaced in line with previous incident (ST40 leak)	Maintenance - Inadequate or improper Maintenance
21048	03/25/2014	Silica	0.2	Top Valve on Broekema tanker once under pressure released a whisp of powder to loading bay area (less than 0.2kg) valve was checked by myself and Ian Thickpenny (line manager) and we noticed it was closed properly	Whole valve fixture needed to be tightened before we restarted the pumping process. This tanker was restarted without any further issue.	Procedures-Failure to follow procedures
21033	03/24/2014	HCL 26%	0.01	During a steady production run the Ash HCL alarmed on the panel. The operators checked the acid area and found HCL from an overflow entering the acid pit. Local deluge alarm sounded, non Cabot personnel then left the acid area. A side burner train was offloaded, and acid in the towers removed back to storage. Shift Manager then raised the site assembly alarm. Source of fumes where contained locally in the acid pit. All clear was given.	Lute filling step was missed during start-up. This relies solely on people completing on plant start-up but is an unusual activity. Given critical nature of lutes to stop releases, instrumentation to DCS operator would stop a repeat scenario or remove need for lutes. Action: Review and cost to install spray bar above Tk-11. Review Acid area PHA for need of overflows. Update Procedure on T-3 to ensure covers priming dip leg (SOP identifies critical nature of lute but does not describe how and when to prime the lute).	Procedures-Failure to follow procedures
20701	03/12/2014	ANH HCL (Wet)	0.1	Following the removal of lagging covering abatement ring on B4 train it revealed signs of leak through the gasket position on either sides of the ring joining the main tube sections of the main train.	1st HP Cooling tube fibre joint blown out, allowing HCL vapour to settle on insulation and corrode the steel work, plus cladding in the immediate vicinity. Fibre washer replaced with Aluminium and joint reset & retorqued to 40nm. Insulation & cladding modified to provide insulation to the end of the cooling tube leaving the gaskets & injection ring OPEN. Cladding around the joint manufactured from S/Steel mesh with top cover to prevent rain hitting injection ring, creating steam. Completed Action: All engineers have now had gasket refresher training will reinforce the contractors to use the correct gasket when leading a project.	Maintenance - Inadequate or improper Maintenance
20616	03/09/2014	Oil	0.25	Oil was noticed leaking around P-117 condensate pump, oil was running down into the bund/sump area. Notified shift manager and team. Oil spill pads were placed below the pump casing and on the affected area adjacent, the pump casing drain plug was tightened as a precaution. Further training required as over-fill when topping up oil level has caused this issue.	Ops not trained in the detail of filling the pump. Action Completed: Train shifts on topping up oil in the pump.	Inadequate training
20102	02/14/2014	Silica	2	Two top hatches (broekema tanker for M5) not sealed correctly by driver after wash station. No issues until we had pumped approx. 100kg under pressure (removed probe and closed lid) approx. 1.5 - 2kg of product spilled.	Line manager informed and all hatches re-secured by myself and the driver and pumping continued as instructed.	Procedures-Failure to follow procedures
19964	02/10/2014	HCL 26%	0.01	Ash detector 037 went off on level 3 on acid area, Investigated area on T-3 and found a small weep of acid leaking out of a small hole. The area where the hole is has been circled with red pen previously. Shift manager informed and inspected leak and on call duty manager informed and advised us to keep running till morning and to monitor situation. Leak to be reviewed by management during the day. Tower monitored throughout rest of shift and area taped off.	T3 tower replaced in March 2014 shutdown. No further issues.	Inadequate design-engineering
19855	02/05/2014	Silica	2	Small amount of silica released from Broekema tanker - Hatches 3 & 5 not secured tightly. Silica release <2Kg .	Immediate action to shutdown pumps. Hatches secured. Continued with fill.	Procedures-Failure to follow procedures
19791	02/01/2014	HCL 19%	0.2	On plant start up, P-27B (19%HCL) acid pump was found to be leaking from the discharge valve assembly (pump side) Pump immediately shut down and isolated, Work order raised 3597660 Plant started up on P27A - no further leaks were observed from the, now off-line, pump	Replacement plan to eliminate mechanical seals on pumps inthe the acid area. Awating capital funding.	Maintenance - Inadequate or improper Maintenance

Incident ID #	Incident Date/Time (mm/dd/yr)	Spill Substance	spill Kg	Description	RCA/Measures Taken	Primary Root Cause
19777	02/01/2014	HCL 28%	0.1	While filling T-3 with 19% acid, the ash detector in the area of E-426 went off. On investigation the bottom of the exchanger was showing signs of leaking. Exchanger was put onto water to flush. Small amount of acid was collected into the tray under the exchanger The Mechanical tech was called in and removed the cover, while still flushing with water a small crack was visible. On call Manager and Engineer have raised an MOC to cover by-passing the exchanger.	Removed from service, awaiting process engineering evaluation prior to returning into service.	Inadequate design-engineering
19671	01/27/2014	Silica	1	Silica powder was leaking from the second lid on the Broekema tanker. Approximately 1 Kg was spilled to ground.	Tanker off-loading stopped immediately, Broekema driver re-tightened hatch. Reported incident to the Shift Manager, who ensured that the remainder of the loading was following correct procedures and area cleaned up. Loading pressure at the time of spill was 0.7 Barg. Haulier complaint raised.	Procedures-Failure to follow procedures
19504	01/21/2014	Silica	5	As tanker was being pressurised after closing of the top hatch we found a leak on the top (rear) valve of the Broekema tanker which caused the spillage of powder over the tanker loading bay. Line manager has been informed and pictures taken.	The reason for this leak and other leaks recently is the fact that drivers are leaving cleaned tanks in the compound and leaving with loaded one, thus not taking responsibility for tightening of hatches and dryness of the tank they have left. I have now requested the removal of the spare tanks and unit and informed Broekema that drivers must be responsible for and present when their tanks are being loaded	Procedures-Failure to follow procedures
19344	01/14/2014	Silica	2	An LM150D tanker was being prepared to load and pressure trip checks were carried out prior to 'autofill' loading sequence. During this activity the 2" discharge line from the 'original' loading pumps blew off discharging air/silica at approx. 4barg. 2 loading operators were in close vicinity when this happened and closed the loading pump manual air valve ending the incident. Shift manager was in the area at the time and witnessed the incident.	After further investigation it was noticed that the pump discharge pressure pad/trip had been replaced with a local pressure gauge. After agreeing with the safety manager it was agreed to return to the new loading pumps to resume tanker filling as these have all relevant trips in place.E&T manager requested to arrange MOC be raised by Warehouse Engineer. Actions completed: Arrange for an additional pressure trip switch to be installed on pumps. Secondary pumping system comissioned and approved to accomodate higher pressure loading.	Inadequate design-engineering
19231	01/09/2014	HCL 28%	0.1	MTD were on site carrying out thickness checks on T3. . Upon inspection a very small weep was noticed.	Level 3 Ring was found to have deteriorated.Offloaded the plant to flush and repair.	Inadequate design-engineering
19082	01/03/2014	HCL 26%	1	At approx. 23:30 the ash detector 029 set off. The Outside operator went out and found acid tracking down the side of T3 at level 1. The leak was traced to level 2 DR1 Box section where acid could be seen tracking down the side. Burners where offloaded and commenced acid area shutdown. Water flushing started. On call Manager and Engineer attended site.	Repaired but T3 tower replaced in March 2	inadequate design-engineering

END