Sawtell Water Reclamation Plant
Chlorine Spill - Learning Outcomes

Photo 1. Failed Neoprene gasket only changed 4 months prior to incident

Photo 2 PTFE Gore GR (James Walker) gasket we changed to after failure

Photo 3. Western drainage valve completely closed with plug in place

Photo 4. Permanently capped eastern drain valve. And concreted inside and sealed

Photo 5. Blind sump at western drain valve installed in place of western drain valve.

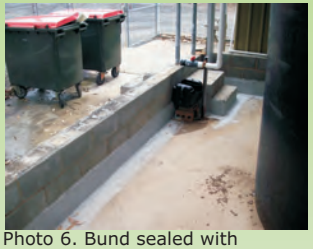

Photo 6. Bund sealed with Dryzoro Maxseal & Flex Grey water sealant stopped leaks as well as rendering.

Photo 7. Sampling site "Spill site" Storm water drain at spill site in Sawtell

Background

Sawtell treatment works opened in 1976 consisting of 3x pasveer channels E.P 6,000 And in 1982 an upgrade was done by adding a Bathurst box E.P 4,000. and again in 1985 a further addition of a Port Macquarie aeration tank E.P 8,000 A Total OF 18,000 EP . The plant run on chlorine gas disinfection until the switch to liquid sodium hypochlorite solution of 13% in 1997 which is stored in 1x 10,000 ltr & 1x 8,000 ltr storage tanks inside a bunded area

Spill of Sodium Hypochlorite Solution

A spill of approx 7,000 ltrs of sodium hypochlorite spilt into bund and escaped same through a partially opened drain valve the chlorine leaked into a storm-water drain which runs through the plant and has a 2 kilometer journey to the ocean

Response

Operator called to plant at 11.44 pm on Sunday night on the 9/01/2011on an unrelated matter but on arrival with smell of chlorine very high investigated and found hypochlorite leak and set out to pump remainder of solution into spare tank approx 3,000 ltrs then advised engineer of problem and arrived onsite 10 mins later he then set out to advise the EPA they informed him to call emergency services when all arrived set out to plan for removal of spill in creek. Put a soil bund in creek and pump all of contaminants out of same. At approx 01.50 am rain begun to fall and upon investigation by hazmat team we were going to get approx 30/50 mm of rain it was then decided to not bund the creek and see what natural flushing by the rainfall would achieve . Operator and engineer begun to monitor chlorine levels at spill site and downstream of plant all the way to the sea so as to gauge the level of contaminant

Prosecution

Council received 3 fines totaling $4500, only minor but could have been a lot worse for breaches.

Breach 1:

Failure to operate plant in a competent manner.

Breach 2:

Failure to maintain plant in a proper and efficient condition.

Breach 3:

Pollution of waters.

Upgrades

Sawtell treatment works chemical bund was upgraded to comply with today's standards with a blind sump and return pump installed. Both isolation valves on the bund were removed and a level float switch to detect spills installed and bund sealed with an epoxy coating.

Lessons Learnt/ Remedial Actions

Coffs Harbour Water learnt a number of lessons as a result of this incident, which are applicable to the wider industry. These include:

- Containment bunds, which appear to be adequate, are often inadequate.
- Containment bunds should not have drainage valves. The drainage valves should be replaced with blind sumps that can be pumped out when required.
- Neoprene gaskets are not suitable for use with 13% Sodium Hypochlorite. Coffs Harbour Water now uses Teflon gaskets exclusively, and has a proactive replacement plan in place.
- Regular audits of containment bunds are required to confirm their integrity, including water tightness.

Coffs Harbour Water has learnt from this mistake, and hopes the wider industry can learn from, and not repeat, this

We are very fortunate and lucky to have had no visible impact on the environment after this incident as we continued to monitor chlorine levels for one week after spill occurred and at the time of incident approx 01.45am we had 48mm of rainfall in just 3hrs very good dilution and natural flush and we continually monitored chlorine levels at all locations shown in photos and results are as quoted in Table 1.

Table 1

		Storm water Drain		Middle Creek				On-
		Onsite		Off site			Up- stream	site
Date	Time	Spill site	Boundary	16th Ave	Bowling Club	Mouth	SPS 15	Pump site
	1:20 AM	>5						
	1:45 AM		>5					
	1:55 AM			0.14				
	2:20 AM	>5						
	2:30 AM		4.1					
	2:45 AM			1.1				
	3:25 AM	7.8						
	3:45 AM		0.4	0.1	0.11	0.14		
	5:00 AM	6.8	0.53	0.04	0.03	0.05		
	5:50 AM	7.2	0.24	0.02	0.04	0.03	0.05	
	8:50 AM	>5	0.47	0.07	0	0.03		
	11:30 AM	>5	0.47	0.07	0.01	0		
	1:30 PM	0.72	0.07	0.07	0.04	0		
	3:00 PM	1.1	0.31	0.05	0.01	0.04		1.57
10/01/2011	5:30 PM	0.11	0.02	0	0.08	0.04		
	8:00 AM	0.09	0.04	0	0.01	0		
	11:30 AM	0.31	0.08	0.02	0.05	0.04		
11/01/2011	2:00 PM	0.13	0.09	0.01	0.02	0.05		
12/01/2011	11:00 AM	0.02	0.03	0.02	0.03	0.01		
13/01/2011	10:00 AM	0.01	0	0.04	0	0.02		
14/01/2011	9:40 am	0.02	0	0.02	0	0.01		
15/01/2011	4:45 AM	0						
16/01/2011	4:45 AM	0						
17/01/2011	9:20 AM	0						

Warren Nazzari
Supertintendent
Sawtell WRP

Photo 8. Junction of Storm water drain & Middle Creek, immediately downstream of WRP boundary.

Photo 9. Sampling site "16th Avenue" Middle Creek at southern end of 16th Avenue, Sawtell.

Photo 10. Sampling site "Bowling Club" Middle Creek at bridge adjacent to Sawtell Bowling Club.

Photo 11.Sampling site "Mouth" Mouth of Middle Creek.