

Report on Hydrosmart

CJ Ord River Sugar Report on Hydrosmart Operation 2003

Author: Mick Conroy – Production Manager – CJ Ord River Sugar

Report on Hydrosmart

CJ Ord River Sugar Report on Hydrosmart Operation 2003

Background & History

CJ Ord River Sugar operates a 120 TPH cane crushing factory in Kununurra which processes 500,000 tonnes of cane per crushing season (April-Oct). The factory operates a 6MW Steam driven turbine and a set of hydraulic/electric driven roller crushing mills which depend on a consistent cool water supply to provide cooling to roller bearing brasses and also to the water cooling side of the turbine bearing casing.

The cooling tower unit used for the cooling of this water is a tube cooler with evaporative fans in the roof of the cooling tower unit – specifications as follows

Circuit Volume 1600 Litres

Makeup Rate: 1700 Litres/Hour

Load: 1000Kw

The cooling tower unit when initially installed was complemented with a chemical dosing program to control deposits in the system and to condition the water supply. After the 2002 crush season inspection of the outside of the cooling coils revealed large deposits of scale on the surface of the units. These 2 cooling coil units had to be sent away to be cleaned and regalvanised which cost approximately \$20,000. Please see following photos of the cooling elements after repair



Report on Hydrosmart

CJ Ord River Sugar Report on Hydrosmart Operation 2003

Also chemical costs for maintaining treatment of the water amounted up to approximately \$8,000 per year.

Investigation into other water conditioning treatments was performed and after reviewing documentation provided by Hydrosmart representative Mr. Peter Cant and discussion during a site visit, it was decided to place a Hydrosmart unit on the cooling tower to treat the external water supply.

The unit was installed approximately 2 metres from any electromagnetic force (achieved by modifying PVC pipe work). See figure 1. – Hydrosmart Installation on cooling tower outer water circuit.



Fig 1

Trial Data & Visual Proofing

Water from the outer water circuit was collected every day during the trial period to analyse it for Phosphate and pH. The data in the log sheet (next page) represents tests carried out on the water supply from the 26/5/03 to the 08/7/03. The conductivity of the external water circuit steadily rose as expected to a point where we made a conscious decision to bleed the solids suspended in the water out of the circuit and make up with clean water. After the first week of the crushing all chemical dosing was stopped except for chlorine addition on a weekly basis to help combat bacterial growth in the tower. A full internal inspection of the tubes was performed 13 weeks after bringing the system online. The tubes were still in a shiny state and the basin of the tower was covered in a sludge 10cm deep, this sludge was hosed out and the basin cleaned.



Report on Hydrosmart

CJ Ord River Sugar Report on Hydrosmart Operation 2003



Tubes



Sludge

One extraordinary effect which was not expected occurred after commissioning of the Hydrosmart unit. We installed the unit to keep the external side of the cooling tower scale free and did see a flow through effect on the internal water circuit which supplies water to the vacuum pan cooling rings, turbine cooling jacket and mill brasses. In particular sections of pipe work in the pans cooling ring started to leak, this being caused from built up scale inside the water pipe being removed exposing worn sections of pipe work (which had been worn from the outside in).

COOLING TOWER CIRCUIT
TEST RESULTS 2003 SEASON

OPEN					CLOSED	
DATE	SHIFT	pH	Conductivity	PO4	pH	Conductivity
26/5	N	9	2,282	0	9.4	259
28/5	N	9	1,937	0	9.4	530
29/5	N	9.1	1,903	0	9.16	262
29/5	D	9.2	1,870	0	9.3	244
30/5	N	9.2	1,797	0	9.16	219
30/5	D	9.2	1,938	0	9.6	244
31/5	N	9.09	2,480	0	9.16	257
1/6	N	9.16	1,488	0	9.06	252
2/6	N	9.35	2,250	0	9	260
3/6	N	9	1884	0	9	262
3/6	D	4.08	2545	0	9.13	267
4/6	N	9.12	2590	0	9.25	263
5/6	N	9	4,24	0	9	236
5/6	D	8.95	935	0	9.05	287
9/6	N	9	933	1.0	9.4	244
10/6	D	8.73	734	1.0	8.44	281
11/6	D	8.87	683	1.0	8.46	302
5/6	D	8.40	1506	0	9.07	275
13/6	D	8.53	779	0	9.00	257
14/6	D	8.57	1,327	0	8.15	311
17/6	D	8.95	1,512	0	8.85	294
18/6	D	9.10	1,804	0	9.03	286
20/6	D	4.18	3320	0	8.61	319
21/6	D	4.36	4190	0	8.97	350
22/6	D	4.34	3260	0	8.62	420
23/6	D	4.54	2000	0	8.64	351
24/6	N	8.10	2440	0	8.15	316
27	N	9.31	3930	0	9.00	350
27/6	D	9.24	4300	0	8.29	342
1/7	D	9.40	6380	0	8.28	326
2/7	D	9.36	6300	0	8.28	319
3/7	D	9.37	7610	0	8.29	311
4/7	D	9.39	8060	0	8.33	309
6/7	D	8.97	474	0	8.16	317
7/7	D	8.82	629	0	8.40	324

Report on Hydrosmart

CJ Ord River Sugar Report on Hydrosmart Operation 2003

Conclusions

The Hydrosmart unit has performed to manufacturers specifications.

It also saves CJ Ord River Sugar

- ~\$8,000 / yr in chemical costs for water treatment
- minimizes employee exposure to chemicals
- negated costly tower tube cleans for the future

The unit has worked well and I am wishing to trial a Hydrosmart Unit on the pre-feed juice to the evaporators for the 2004 crush season.