

Report

Water Management Report - Relocation of Cookson Plibrico

Prepared for Prince Property Consulting (Client)

By Beca Pty Ltd (Beca)

ABN: 85 004 974 341

22 May 2009

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Revision History

Revision N°	Prepared By	Description	Date
A	Stuart Milling	Preliminary Draft	April 2009
	Tim Shelton		
	Tiffany Chan		
B	Stuart Milling	First Issue	22 May 2009

Document Acceptance

Action	Name	Signed	Date
Prepared by	Stuart Milling	<i>S. Milling</i>	22/5/09
Reviewed by	Dianne Thomas	<i>D. Thomas</i>	21/5/09
Approved by	Emil Toussis	<i>Emil Toussis</i>	22/5/09
on behalf of	Beca Pty Ltd		

Executive Summary

The proposal under consideration is the relocation of the Cookson Plibrico refractories manufacturing plant from its current location at Bulli to a new facility at Sylvester Avenue Unanderra. In essence the current manufacturing processes will remain unchanged (it will be slightly streamlined), with the majority of the equipment to be transferred to the new site. The plant produces approximately 21,000 tonnes of product each year.

The process utilises relatively small quantities of water (approx. 400 L/day), this being predominantly for the wash down of product mixing bins. Of the estimated total 4,200 L/day of waste water produced, approximately 90% is domestic sewer / grey water resulting from the 70 employees which are to be on site at any one time. An independent chemical analysis of the process waste water indicates that there are not any significant levels of “toxic” or “dangerous” substances contained in the water.

It is proposed that all waste water be treated to a tertiary level through an on site package treatment plant, and that the treated water then, following even further dilution through the rainwater collection tanks, be either reused on the site or overflow to the stormwater system. This is considered to be technically feasible and appropriate within the relevant statutory requirements. The final approval authority for this system rests with Wollongong City Council (the Department of Environment and Conservation have advised that this treatment process will not require an Environmental Protection Licence).

The new facility will incorporate a rainwater harvesting system. A total of 30,000 litres of storage capacity will be dedicated to use where possible in flushing toilets, external wash down and irrigation. The adoption of rainwater harvesting will result in a significant reduction in the potable water demand of the facility and its inclusion represents a significant improvement on the current operating conditions at the Bulli site where there is no rainwater harvesting or water reuse system.

The proposed stormwater management system for the Unanderra site is considered appropriate and it contains design features which will aid in the improvement of the runoff water quality.

The water management systems proposed by Cookson Plibrico for their new Unanderra site represent good environmentally sensitive design practice which should not result in any significant adverse impacts. In fact, the proposed systems should result in a net reduction of the facilities demand on both the potable water supply and public sewerage infrastructure when compared to the current Bulli based operation.

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1 Introduction

Prince Property Consulting, acting on behalf of Cookson Plibrico engaged Beca in March 2009 to conduct a review of the water management for the proposed relocation of the Cookson Plibrico plant.

Cookson Plibrico can be classified as a ceramics manufacturing industry specialising in refractory operations, and it has a current production of approximately 21,000 tonnes per year. Approximately 90% of this product is made from alumina based cementitious materials. The finished products are shipped as premixed powders in various bag sizes, packaged wet clays and precast concrete shapes for use in the steelmaking and aluminium smelting industries.

Our understanding of the process indicates that it utilises relatively small quantities of water, this being predominantly for the wash down of product mixing bins. The same wash down forms the majority of the process based waste water.

Cookson Plibrico have advised that the normal operating workforce for the plant is in the order of 70 personnel on site at any one time. Normal "domestic" grade sewage from the site personnel is understood to form the largest component (approximately 90%) of the overall waste water discharge from the plant. A significant point for consideration in this report is the fact that there is no access to Sydney Water's sewer system in the vicinity of the proposed Unanderra site.

The company is currently situated at Bulli (of Beattie Ave), with a proposed new commercial site located at 12 Sylvester Avenue Unanderra, where the primary day to day site access will actually be via a right-of-way to the Princess Highway.

Beca's main objective was to provide an assessment of Cookson Plibrico's proposed water management systems for the new site with respect to the relevant statutory requirements and guidelines (including water use and sources, waste water, water reuse, rainwater harvesting and stormwater management).

2 References

In undertaking this study Beca has made use of the following references and sources:

- n The Department of Environment and Climate Change (DECC) 2008 *Waste Classification Guidelines* [DECC, 2008].
- n The Protection of Environment Operations Act (POEO) regarding *the Guide to Licensing for ceramics works* [DECC, 2008].
- n Wollongong City Council – Drainage Design Code (1994)
- n Interim NSW Guidelines for Management of Private Recycled Water Schemes – Department of Water and Energy [DWE, May 2008].
- n Preliminary Environmental Assessment Report [TCG Planning - Feb 2009].
- n DA Concept Site Stormwater Drainage Plan - K.F. Williams [ref KF109450]
- n Correspondence with Cookson Plibrico Staff.
- n Correspondence with (DECC) Wollongong.

3 Description of the Proposal

It is proposed that Cookson Plibrico will relocate the majority of its existing equipment to a new 8,000m² factory at the Unanderra site. 900m² of the new facility is to be dedicated to offices, lunch rooms, locker rooms and shower / toilet amenities. The refractory operation consists of five main manufacturing units, as detailed in Table A.

Table A - Manufacturing units of Cookson Plibrico's refractory operations

Unit	Name	Production (Mtpa)	Description
1.	Teka Mill	14,000; of which: § 9,000 - 10,000 MT for direct sale, and § 4,000-5,000MT for internal use	Consists of three sub systems that operate independently • Crusher – Feed consists of bauxite lumps which are crushed into three size ranges • Ball Mill – Receives product from crusher and pulverises to fine powder form • TEKA - Bulk solids batching, mixing and bagging station Some of the Teka products get used within factory (i.e. RAM Extruder, Comcast etc), others sold externally.
2.	RAM Extruder	850	Mixes dry powder from Teka with water and additives (including phosphoric acid) then extrudes clay-like finished product. Operated once per week, flexible with feed composition
3.	Taphole Clay (aka Gunning Clay)	2,000 - 3,000	Mixes various ingredients, majority being powders mixed with hot resin and hexamine powders. Extrudes Clay into packaging containers. Negligible amount from Teka Mill is used here
4.	Comcast	3,000 - 4,000	Mixes dry powder from Teka with water. Then pours material into mould where it is cured in ambient air followed by a dryer. Manufactures product (rectangular slabs) for furnace liner at aluminium smelter.
5.	Small Precast	200	Similar to Comcast Variety of cast shapes manufactured for foundry steel and petroleum industry

The proposed Sylvester Avenue site is currently undeveloped. It is accessed via either Sylvester Avenue or the Princess Highway. The site topography has a significant fall from the Sylvester

Avenue end down to the Princes Highway, and all drainage must therefore be directed toward the Highway. The development will comprise predominantly hardstand / paved areas for car parking and heavy vehicle manoeuvring, with some area being dedicated to landscaping.

It is proposed that the new development incorporate rainwater harvesting and an on site package water treatment plant. More details of the proposed systems follow.

4 Stormwater Management

The concept stormwater drainage system proposed by K.F. Williams Pty Ltd addresses both the immediate site runoff and that entering the site from Sylvester Avenue. We understand that this system has been designed in consultation with Wollongong City Council and with due reference to Council's Stormwater Drainage Design Code.

The site lies within the Mullet Creek catchment and it is situated within an on-site-detention exclusion zone (as stipulated by Wollongong City Council). The basic philosophy of the system design is to discharge site runoff to the Princess Highway system via a long open swale drain (approx. 120m long) which is adjacent to the proposed site access road.

This is considered to be a good solution as the swale can be planted with a combination of native grasses and suitable watercourse vegetation. This will enable an effective primary treatment process to occur, removing a large portion of sediments in particular (and potentially some other minor contaminants) from the low flows and first flush, hence enhancing the water quality of the site stormwater discharge.

We understand that the runoff from Sylvester Avenue which enters the site is to be collected separately into an open drain which is to run around the northern site boundary before connecting into the common open drain / swale running beside the Princess Highway access. This approach is considered to be appropriate in this situation and within normal stormwater design practices and guidelines set by Council.

Site sediment and erosion control is likely to be an issue only during the construction phase of the project. KF Williams have documented a construction sediment and erosion control plan which is to be adopted.

5 Rainwater Harvesting

It is proposed that the new facility incorporate two 15,000 litre tanks to collect rainwater from the building roof for use where possible in flushing toilets, external wash down and irrigation. It is also proposed that these tanks be supplemented with tertiary treated waste water from the on site package treatment plant.

It is noted that toilet flushing is a major component of the "domestic" water consumption on the site. Hence, the adoption of rainwater harvesting will result in a significant reduction in the potable water demand of the facility.

A total storage volume of 30,000 litres is considered to be appropriate for this facility and its inclusion represents a significant improvement on the current operation conditions at the Bulli site where there is no rainwater harvesting or water reuse system. Overflow from the tanks will discharge into the site stormwater system.

6 Waste Water Management

On the basis of our understanding of the manufacturing process and information provided by Cookson Plibrico we have estimated the daily waste water discharge to be as follows:

n Domestic Sewage (toilets):	1,400 L/day
n Domestic Grey Water (showers, etc):	2,400 L/day
n Process water (mostly wash down of mixing hoppers):	<u>400 L/day</u>
Total Estimated Waste Water:	4,200 L/day

The above figures are based upon up to seventy (70) employees present on site at one time, many of whom would normally have a shower each day prior to going home. The estimated total discharge of 4,200 L/day is not large in relative terms and is indicative of the relatively small process water usage.

Currently, at the Bulli site the domestic waste is discharged directly to the Sydney Water system, while the process waste water passes through a basic sedimentation process prior to being stored in a below ground tank from where it is pumped out by a contractor and taken to Veolia's Liquid Waste Centre at Unanderra.

Waste Water Treatment and Reuse

We are advised that there is no connection point to Sydney Water's sewer system within the vicinity of the site (we understand that the nearest connection could involve the construction of a new pipe in excess of 400m in length). Hence it is necessary to consider either an on site treatment process or a pump-out system.

The property developer has decided to adopt the installation of an on site package treatment plant which will treat both the domestic sewage / grey water and the process waste water to a tertiary level suitable for reuse on the site (via supplementation of the rainwater collection storages) and / or discharge to the site stormwater system.

The system would work by directing all site waste water to the package treatment plant (preferably by gravity feed – which should be possible on this site), where it would be treated to a high tertiary level consistent with all relevant Australian Standards. This water will be of good enough quality to safely irrigate landscape areas, flush toilets, or discharge direct to the stormwater system. The treated water would then be pumped to the rainwater collection tanks where it will be further diluted with the fresh rainwater, from where it will be reticulated to the site reuse applications described in Section 5.

Discussions with a number of waste water treatment plant suppliers indicate that all of the waste water generated on site can be suitably treated with a proprietary system.

The grit / sludge produced from the water treatment process can be either stored and removed by tanker to Veolia's Unanderra plant, or dried and placed on site in an appropriate location.

Process Waste Water Stream Analysis

An analysis of the contents of the process waste water stream is included in Appendix A. This analysis was carried out by an independent laboratory and provided to us by Cookson Plibrico. It indicates that there are not any significant levels of toxic or dangerous substances contained in the water, although there are a few components requiring further consideration in the design of the on site package treatment plant. These include the elevated levels of oils and greases, alkalinity as (CaCo3), pH 11.2, and the suspended solids. However, discussions with a number of water treatment plant manufacturers indicate that all of these components can be satisfactorily dealt with within the normal parameters of the plant designs.

Statutory Approval Requirements

We have discussed the proposed on site treatment proposal with the NSW Department of Environment and Climate Change (DECC) who have advised that the proposed plant is relatively small in nature and hence will not require an Environmental Protection Licence (nor will the development as a whole). The DECC hence advises that final approval of the on site treatment plant will stand under to jurisdiction of Wollongong City Council.

A copy of the correspondence from the DEC confirming the above advice is attached in Appendix B.

7 Conclusion

The manufacturing activities proposed for the new site are fundamentally the same as those carried out by Cookson Plibrico at the existing Bulli plant. These activities have a relatively low demand on the potable water supply and this demand will decrease even further at the new site as a result of the implementation of rainwater harvesting and on site waste water treatment and reuse systems.

The waste water stream represents a discharge in the order of 4,200 litres per day, approximately 90% of which comprises domestic sewage / grey water. The remaining 10% is process water which does not contain any significant levels of special or hazardous substances. The proposal to process all waste water to a tertiary level through an on site package treatment plant, and to then either reuse this treated water on the site or discharge overflow to the stormwater system is considered to be technically feasible and appropriate within the relevant statutory requirements. The final approval authority for this system rests with Wollongong City Council.

The proposed stormwater management system for the Unanderra site is considered appropriate and it contains design features which will aid in the improvement of the runoff water quality prior to discharge into the existing Princes Highway system. In general the concept design would appear to comply with the requirements of Council's Stormwater Drainage Design Code.

The water management systems proposed by Cookson Plibrico for their new Unanderra site represent good environmentally sensitive design practice which should not result in any significant adverse impacts. In fact, the proposed systems should result in a net reduction of the facilities demand on both the potable water supply and public sewerage infrastructure when compared to the current Bulli based operation.

Appendix A

Waste Water Analysis

Analytical Report

Cleanaway Pty Ltd
5 Charcoal Close
Unanderra
NSW, 2526

Phone: **02 4262 3333**

Fax: **02 4271 4253**

Contact Name: **Matthew Ward**

Report Number: **W09/1177**

Sample(s) Received: **27/04/2009**

Client Reference: **Cookson**

Batch Number: **W29744**

Notes:

The results stated in this report relate only to the sample(s) as submitted by the client.
Samples analysed as received.

Results Approved By:



Glenn Davies
Laboratory Manager

NATA Accredited Laboratory
No: 992



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Results:

Client Id		Cooksons				
Laboratory Id		W29744/001				
Alkalinity as (CaCO₃)						
Method: WCM003	Units: mg CaCO ₃ /L	1800				
Ammonia as N						
Method: WCM107	Units: mg/L	<0.02				
Antimony						
Method: WCM073A	Units: mg/L	<0.01				

Date Reported: Tuesday May 12, 2009

Page 1 of 3

Analytical Report

Report No: W09/1177

Results:						
Client Id		Cooksons				
Laboratory Id		W29744/001				
Arsenic						
Method: WCM073A	Units: mg/L	<0.01				
BOD5						
Method: WCM012	Units: mg O2/L	12				
Cadmium						
Method: WCM073A	Units: mg/L	<0.01				
Chromium						
Method: WCM073A	Units: mg/L	0.01				
Lead						
Method: WCM073A	Units: mg/L	<0.01				
Mercury						
Method: WCM073A	Units: mg/L	<0.01				
Molybdenum						
Method: WCM073A	Units: mg/L	<0.01				
Oil & Grease (IR)						
Method: WCM077	Units: mg/L	5.2				
pH						
Method: WCM050	Units: pH units	11.2				
Selenium						
Method: WCM073A	Units: mg/L	<0.01				
Tin						
Method: WCM073A	Units: mg/L	<0.01				
Total dissolved solids						
Method: WCM002	Units: mg/L	4000				
Total nitrogen						
Method: WCM111	Units: mg/L	0.75				
Total suspended solids						
Method: WCM004	Units: mg/L	2200				
Zinc						
Method: WCM073A	Units: mg/L	0.06				

Method(s):

WCM002	Total dissolved solids
WCM003	Alkalinity as (CaCO ₃)
WCM004	Total suspended solids
WCM012	BOD5

Analytical Report

Report No: W09/1177

WCM050	pH
WCM073A	Antimony
WCM073A	Arsenic
WCM073A	Cadmium
WCM073A	Chromium
WCM073A	Lead
WCM073A	Mercury
WCM073A	Molybdenum
WCM073A	Selenium
WCM073A	Tin
WCM073A	Zinc
WCM077	Oil & Grease (IR)
WCM107	Ammonia as N
WCM111	Total nitrogen

Appendix B

DECC Correspondence

Stuart Milling

From: Dianne Thomas
Sent: Tuesday, 19 May 2009 3:04 PM
To: Tim Shelton
Cc: Stuart Milling; Tiffany Chan
Subject: FW: Email from DECC
Follow Up Flag: Follow up
Flag Status: Completed

Hi Tim. Response from DECC is attached. The letter still stands and discharge licence is not required. Sorry for the furphy.

Dianne

From: Greg Newman [mailto:Greg.Newman@environment.nsw.gov.au]
Sent: Tuesday, 19 May 2009 2:59 PM
To: Dianne Thomas
Cc: Georgia.Ivancevic@planning.nsw.gov.au
Subject: RE: Email from DECC

Hi Dianne

A treatment system of that size would not require an environment protection licence (see legislation below) therefore the original letter would not change. I understand the STP would need approval from Wollongong Council as the appropriate regulatory authority for POEO Act matters. Suri Mora at WCC is the appropriate contact. Happy to discuss. Regards Greg 42244103

36 Sewage treatment

This clause applies to *sewage treatment*, meaning the operation of sewage treatment systems (including the treatment works, pumping stations, sewage overflow structures and the reticulation system) that involve the discharge or likely discharge of wastes or by-products to land or waters.

The activity to which this clause applies is declared to be a scheduled activity if it has a processing capacity that exceeds:
 2,500 persons equivalent, as determined in accordance with guidelines established by an EPA Gazettal notice, or
 750 kilolitres per day,
 whichever is the greater.

From: Dianne Thomas [mailto:Dianne.Thomas@beca.com]
Sent: Tuesday, 19 May 2009 2:40 PM
To: Newman Greg
Subject: FW: Email from DECC

Hello Greg. I am a water and wastewater engineer at Beca. I have been working with Tim Shelton on the Cookson refractory project at Unanderra. This site will have an on site sewage treatment plant that will treat about 4kL of toilet, shower and domestic effluent each day. The treated effluent will be used onsite, with excess overflowing to stormwater. Does this change the information in the attached letter?

This was the reason for my call. I thought it was worth checking the onsite sewage treatment plant does not need a discharge licence.

Looking forward to hearing from you.

Dianne Thomas
 Project Director, Water
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<<cookson no interest.pdf>>

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19/05/2009

Our reference: FIL09/2935:DOC09/16743:GN
Contact: Greg Newman, (02) 4224 4100

Department of Planning
Major Developments Assessment Unit
(Attention: Ms Georgia Ivancevic)
GPO Box 39
SYDNEY NSW 2001

Dear Madam

**NO FURTHER INTEREST IN PROPOSED COOKSON PLIBRICO REFRACTORY PROJECT
UNANDERRA**

I am writing to confirm recent discussions between the Department of Environment and Climate Change (the Department) and the Department of Planning regarding the proposed Cookson Plibrico Refractory Project. Following a review of the Preliminary Environmental Assessment (EA) the Department provided EA Requirements in February 2009 (our reference DOC09/6516) for the proposed development. Since this time the Department has conducted a site inspection of the current operations and reviewed a draft Air Assessment Report. Details of our findings and some additional considerations are provided below. On the basis of a review of this information I advise that the proposed development does not require an Environment Protection Licence (EPL) and for this reason the Department declares no further interest in being involved in the approval process.

Site Inspection

Based on our review of the Preliminary EA we initially believed the development would require an EPL under the Scheduled Activity: *Ceramic Works and Crushing, Grinding and Separating Works* of the Protection of the Environment Operations (POEO) Act 1997. Following a site inspection of the existing production processes on 20 March 2009, discussions with the proponent, and consideration of the proposed hours of operations presented in the Preliminary EA, the scale of the operation is less than that requiring an EPL. This makes Wollongong City Council the appropriate regulatory authority under the POEO Act for this activity and I also note the Council is the regulatory authority for the existing operations.

Draft Air Assessment Report

On 12 March 2009 the Department received a draft report written by Envirodyne Group Pty Ltd titled *Assessment of Air Quality Issues for the Relocation of the Cookson Plibrico Manufacturing Plant To Unanderra, NSW*. The Department has reviewed this draft report and believes it does not meet the requirements of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Approved Methods) and subsequently the EA Requirements. Specifically the assessment of air emissions requires dispersion modelling to confirm ground level pollutant concentrations are below the listed criteria. In addition the assessment of the toxic air pollutants listed in the draft report (and any others identified during the assessment) should be undertaken per the methodology listed in Chapter 7 of the Approved Methods document. The

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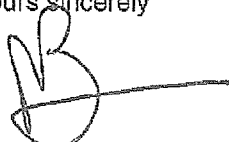
Department of **Environment and Conservation** NSW



Department has provided this feedback to the Mr Mike O'Brien of Envirodyne and suggests the Department of Planning consider this matter during the assessment process.

Please call Greg Newman on (02) 4224 4100 should you have any questions regarding the above matters.

Yours sincerely



24/4/09

PETER BLOEM
Acting Manager Illawarra
Environment Protection and Regulation

cc: TCG Planning
(Attention: Casey O'Brien)
PO Box 848
WOLLONGONG NSW 2520