

INQUIRY INTO KOORAGANG ISLAND ORICA CHEMICAL LEAK

Organisation: Stockton Community Action Group

Date received: 4/11/2011

BRIEFING NOTE

Date: 4 November 2011

TO: THE LEGISLATIVE COUNCIL SELECT COMMITTEE ON KOORAGANG ISLAND

FROM: STOCKTON COMMUNITY ACTION GROUP

SUBJECT: SUBMISSION TO THE LEGISLATIVE COUNCIL SELECT COMMITTEE ON THE KOORAGANG ISLAND ORICA CHEMICAL LEAK

PURPOSE:

To respond to the Terms of Reference outlined by the Select Committee on the Kooragang Island on the Orica Chemical Leak.

BACKGROUND:

On 8 August 2011, Orica Kooragang Island released Chromium VI. The response to this incident was inadequate and should be the catalyst for greater Government and Industry environmental responsibility. In response to this incident, The Stockton Community Action Group formed on 29 September 2011, aiming to make our environment safe and clean.

ISSUES:

- Inadequacy of the response by Orica, the Government and other Authorities, including:
 - Time delay in notifying the community of the incident; and
 - Inadequate information surrounding the incident.
- Lack of adequate Emergency Response Planning and Execution by Orica (on site and off site).
- The production and storage of Dangerous Explosives and chemicals on Kooragang Island, located in close proximity to residential communities.
- Concerns regarding all pollutants released by, and licensing limits, for Orica.

RECOMMENDATIONS:

- The Government and relevant Authorities should undertake a full Risk Review and review of existing licensing agreements and their related potential community health impacts, as an immediate priority, for all current and proposed industries on Kooragang Island;
- There must be immediate action taken by relevant Authorities to review the potential catastrophic mix of current approved and proposed industries working on the Kooragang Island site;
- A more effective explanation of the delay in reporting the Orica incident to the Stockton Community must be provided than what was given in the O'Reilly Report;
- There is a need for greater transparency and community involvement in matters that directly relate to the health and well-being of the greater Newcastle Community;
- There is a need for immediate, effective and transparent environmental monitoring (including air and water);
- It is imperative to have limits placed on Orica for nitrogen dioxide and PM2.5 and PM 10 particles and these must be set at world's best practice; and
- There is a need for a full review and the creation of community Emergency Management Plans, specifically for the isolated community of Stockton, including emergency simulation exercises, evacuation procedures, audible alarm systems and electronic communication (text messaging etc).

ADDITIONAL INFORMATION:

Please see attached Submission in Response to Terms of Reference.

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a) Orica's response following the incident:

i) How the Chromium VI was released and how Orica became aware it had been released:

At the public meeting held by Orica on 18 August, the Site Manager, Stuart Newman stated that staff were not aware until well after the incident that Chromium VI had been released.

If true, this is of great concern to the Stockton Community Action Group, as we had thought that staff would have the training and skills to identify such potentially hazardous toxins and potential scenarios would have been tested for all possible chemicals that could be released.

We also note a statement in the O'Reilly Report (source not quoted) that the airborne release "was quickly detected by personnel in the Ammonia plant and actions were immediately undertaken to stop the release" (at page 7 Description of the Incident).

Any question such as, 'How Orica became aware', must take account of the fact Orica, as a company is not a human person but a separate legal entity. We take the view that whenever Orica workers become aware of a potentially dangerous incident in the course of their work duties that this is made known to the company immediately.

We assume those workers who had the toxic substance fall on them were immediately aware of the fallout. The pertinent questions then are:

1. Which Orica staff became aware that the fallout included Cr(VI)?;
2. When did they become aware of this?; and
3. Who else within Orica (and at which levels of management) was made aware of this?

We consider the answers to these questions to be crucial to any proper evaluation of the incident.

ii) Orica's understanding of the geographic extent and environmental impact of the leak:

Orica Management's lack of understanding of the geographic extent and environmental impact of the leak appears incongruous. The Orica plant exists in very close proximity to the residential community of Stockton, and is also in close proximity to a number of other suburbs of Newcastle. It is very rare that there are no prevailing winds in the area. The Stockton Community Action Group is alarmed that a chemical company can exist in a residential area and not have as a very high priority the consideration of any potential impacts of chemical leaks on the local geographical area.

The question can be raised: Was Orica's failure to immediately notify the OEH Hunter Regional Office connected in any way to an opinion of members of Orica staff or management that the fallout was contained on-site?

If so, this raises very serious questions about the ability of Orica management, at the very least in relation to ensuring the plant is staffed with suitably trained and qualified workers.

iii) Whether the potential health and other impacts of the leak on Orica workers and on the community around the company's plant were adequately addressed:

The Stockton Community Action Group believes that the potential health and other impacts on workers and community members were not adequately addressed at the time of the incident. The lack of adequate response by Orica staff or management contributed to many people being needlessly exposed to contact with a known carcinogen.

The childcare centre that was in the path of the wind direction at the time. The centre was not immediately notified of the danger and as such, children continued to play outside as was normal during the fallout period and ensuing days. A High School from Mayfield brought over 500 students to Stockton on 9th August to conduct a walkathon, which began and ended directly across the river from the Orica Plant.

Residents went about their daily business unaware of the potential dangers to their health for a period of 3 days. A number of residents have complained of experiencing acute symptoms such as severe irritations to eyes and also nosebleeds, which they suspect, are associated with the leak.

Some of these situations might have been avoided if Orica staff or Management had given warnings immediately.

iv) The actions and timing of Orica in reporting the leak and addressing its immediate impacts:

Much of the Stockton community remains considerably dismayed by the lack of immediate and adequate response to the incident on 8th August 2011 and adequate communication of risks by Orica staff and Management to the Stockton community. The Stockton Community Action Group understand that there are a series of actions in place within the Displan process which were not activated on 8th August due to timing of notifications in the process.

We are concerned that there may have been unwillingness on the part of Orica staff and/or Management to inform the OEH due to the potentially damaging political consequences, in particular in light of Orica's continued negotiations for expansion of the plant. We expect that this inquiry will produce a full explanation, and we firmly request a far better explanation of the delay in reporting than that provided in the O'Reilly report, which simply states [page 12, Notification of environmental harm] "It is difficult to understand why it took Orica some 17 hours to inform OEH. Orica has expressed its regret ..."

The differentiation between an incident and an emergency is unclear and as such Orica's requirement to inform immediately of an incident should enable response bodies other than Orica to establish this response process in the future.

The Stockton Community Action Group believes that Orica failed in its Duty of Care to its workers and to the community by its response to the incident and particularly to the

timing of its notification to the authorities. As outlined in the O'Reilly Report, page 12-13, it took:

16 ½ hours after the incident for Orica to notify the OEH Hunter Regional Office

17 hours after the incident for Orica to notify WorkCover

42 hours after the incident for Orica to advise Hunter Health

RECOMMENDATION: A more effective explanation of the delay in reporting the Orica incident to the Stockton Community must be provided than what was given in the O'Reilly Report.

v) The adequacy of Orica's emergency response plans and safety plans with respect to chemical discharge or explosion prior to the incident:

The Stockton Community Action Group believe that Orica's emergency response and safety plan as applied to the incident on 8th August was completely inadequate.

The Stockton Community Action Group further believe that the Stockton community at large has lost confidence in Orica's ability to adequately respond and to adequately ensure the safety of the Stockton community in the event of a chemical discharge or explosion because of their response to the incident on 8 August.

vi) Compliance by Orica with licensing or regulatory obligations arising from the incident:

We note that Orica's Environment Protection Licence Number 828 is in reality a licence to pollute, within certain limits. Inherent in the licensing principles is a balancing of risk versus benefit. Orica's licence does not include the right to spread Cr (VI) on Stockton homes as occurred on 8 August. The Stockton Community Action Group is aware that Orica has an alarming history of lack of compliance with licensing regulatory obligations and believes that this history of non-compliance demonstrates a major flaw in licensing.

We also note the history of the plant on Kooragang Island. In particular we note the age of the plant. We note the greater knowledge and understanding of the importance of environmental considerations today, as compared with when the operation of a

chemical plant in very close proximity to a residential community was originally approved.

We are concerned that Orica's Kooragang Island plant is not subject to requirements that accord with current world best practice. In light of Orica's failure to observe licence requirements, in this case and in the past, we consider it is clear that either (1) Orica is unable to operate a chemical plant within the licence parameters, and/or (2) it is not possible for a chemical plant to be operated within the licence parameters.

In either case, we believe that a full risk review and review of existing licensing principles must be undertaken as a priority.

vii) Whether other toxic chemicals stored or produced on the Orica Kooragang site have potential to affect the community and environment

The Stockton Community Action Group are very concerned about other toxic chemicals that may be stored or produced on the Orica Kooragang site and on other sites on Kooragang Island. The Stockton Community Action Group is very conscious that accidents can happen, as exemplified in the incident on 8 August. The fact that toxic chemicals can be stored and produced on a site so close to residential areas is very concerning.

viii) Orica's response plan to the incident

Please see v) above.

RECOMMENDATIONS:

The Government and relevant Authorities should undertake a full Risk Review and review of existing licensing agreements and their related potential community health impacts, as an immediate priority, for all current and proposed industries on Kooragang Island.

There must be immediate action taken by relevant Authorities to review the potential catastrophic mix of current approved and proposed industries working on the Kooragang Island site.

b) The NSW Government's response following the incident

i) The timelines and reporting

The Stockton Community Action Group is extremely disappointed and alarmed about the delayed response from the NSW Government following the incident on Monday 8th August 2011. Once Orica informed Government bodies, there was a very long lead-time before residents were notified. The fact that most residents found out about the incident on the nightly news service on Thursday night 11 August or on the morning news on Friday 12 August is also of major concern.

ii) The actions of government departments and agencies once notified and

iii) The actions of government ministers and ministerial staff once notified:

The Stockton Community Action Group has great concern over the lack of action of Government departments once notified of the incidents. According to the O'Reilly Report, pages 12-13, the OEH Hunter Regional Office took 25 ½ hours after being notified to organise a briefing with Hunter Health, the OEH Hunter Regional Office took 27 ½ hours after being notified to advise Police of the incident FRNSW Hazmat was notified by an anonymous phone call 3 hours after Orica notified OEH Hunter Regional Office.

This lack of action by OEH Hunter Regional Office is of great concern to the Stockton Community Action Group. Subsequent notification to the Minister for the Environment and Heritage and the Ministry of Police and Emergency Services is also of great concern.

The culmination of lack of communication between Government Agencies, Departments and Ministries and then subsequent communication from the Environment Minister to the community, resulted in a potentially highly dangerous situation happening without knowledge of the people who were in danger until 72 hours after the incident.

This was no apparent reason for this delay apart from lack of appropriate systems and communication. An alternative explanation would be that there may have been

reluctance on the part of Government Agencies and the Environment Minister to go public based on political considerations.

The Stockton Community Action Group request that implementation of a Location Based System Telephone Alert System be made a higher priority and be initiated well before the identified mid-late 2012 date that is outlined in the O'Reilly Report.

We also request a full review of procedures for notifying Stockton residents of an emergency. A review should include a survey of how many people (including children) in Stockton are aware of and understand the current recommended action to take in event of an emergency notification.

RECOMMENDATION:

There is a need for a full review and the creation of community Emergency Management Plans, specifically for the isolated community of Stockton, including emergency simulation exercises, evacuation procedures, audible alarm systems and electronic communication (text messaging etc).

c) The final report of the inquiry into the chemical leak at the Orica site being conducted by Brendan O'Reilly

The Stockton Community Action Group has reviewed the O'Reilly report and believes that the recommendations do not go far enough despite the report recognising some important points.

The terms of reference of the O'Reilly Report included to consider the response to the incident, and to identify any improvements to ensure effective response to serious pollution incidents, and for communicating accurate up-to-date information to affected communities.

Mr O'Reilly gives a description of the incident [page 7]. He does not state the source of his information any more explicitly than 'Orica advised...' We do not know who or how many persons Mr O'Reilly spoke with at Orica, or at what levels of management. His description of how there came to be an airborne release of chromium 6 comes to a dead-end with the conclusion "the exact mechanism is not clear".

We consider that a proper response to a serious pollution incident must necessarily include a thorough review of exactly why it occurred in the first place.

We are most concerned that the premise of Mr O'Reilly's report is that serious pollution incidents will continue to occur. In our view, as residents of one of the communities most likely to be affected by such incidents, this premise is unacceptable.

In his Executive Summary Mr O'Reilly states that OEH and NSW Health both did follow the agreed roles and responsibilities once they were notified.

This is despite his finding that NSW Health was informed of the leak 42 hours after the incident occurred yet took no steps at all to inform the residents of Stockton. Yet NSW Health does recommend that precautions should be taken to reduce possible exposure to chromium 6. The recommendations include: do not drink from rain water tanks; do not eat home grown foods; wash hands after being outside; and prevent your children from playing in the garden. Stockton residents were not given this information until several days later, after the leak was eventually made public.

Mr O'Reilly found that OEH Hunter Regional Office was informed of the leak 16 ½ hours after the incident occurred, yet took no steps at all to inform the residents of Stockton. Deep inside the report [at page 34] he states OEH should have taken the initiative when first understanding the emission had not been contained. This is the only criticism Mr O'Reilly makes. He suggests that OEH should have tried to speed up the testing to find out if residents' health was at risk, because at that time "OEH did not know categorically that Stockton residents' health was NOT at risk". He does not criticise the decision not to warn Stockton residents.

In addition to this, Mr O'Reilly found that 46 ½ hours after the incident the Minister for the Environment and Heritage was notified of the incident, yet took no steps at all to inform the residents of Stockton. Mr O'Reilly's only comment in relation to the role of the Minister is to offer the suggestion that the ministerial statement, notifying parliament of the incident led to strong media interest, which "resulted in increased concerns and confusion in the minds of the public". The implication of his comment appears to be that we were worse off by being scared and confused after the leak was made public. We reject this notion completely.

It is clear to us that neither OEH nor the Minister, nor NSW Health nor Orica itself, had prioritised warning the residents of Stockton that we were living in the midst of a potential serious health hazard. It was not a priority for them to tell us that there were steps we should be taking to reduce their risk of exposure. What their priorities actually were is a matter we are hoping this inquiry will discover. Meanwhile it is greatly disappointing to us that Mr O'Reilly in his Executive Summary simply confirms that OEH and NSW Health 'did follow their agreed roles and responsibilities'.

Mr O'Reilly also appears to absolve Orica Pty Ltd of criticism in its response to the incident. The delay in notifying the various authorities is certainly referred to in the Report. However the Executive Summary proclaims that "Orica has expressed its regret", implying that this is in some way relevant.

Mr O'Reilly reports that 'with the benefit of hindsight Orica would notify sooner'. Mr O'Reilly makes no recommendations as to how in future Orica will be able to operate, in a similar situation, with the benefit of hindsight. Hindsight would appear to be by definition something that Orica will once again lack in any future incident or emergency.

It is a great disappointment to us that Mr O'Reilly takes an entire paragraph in his Executive Summary to describe Orica's regret, and how they have learned so much from the incident about what the community expects, and how Orica has already sent a Community Newsletter assuring us that it will improve its community engagement. There is nothing particularly complex about what we want from Orica. It is quite simple; obey the terms of the licence.

As noted above, it is a concern to us that the Report does not specify the precise source(s) of the information Mr O'Reilly states he received from 'Orica'. There is no suggestion from Mr O'Reilly that there either was or was not negligence on the part of the company leading to this incident.

Mr O'Reilly makes no recommendations in relation to prosecutions under the Protection of the Environment Operations Act, or under any other criminal provisions. It is a concern to us that there has been no mention of possible significant sanctions, particularly in light of Orica's history of repeated breaches, and the possible link between that history and the history of regulatory authorities in failing to impose penalties on Orica.

We consider it unacceptable that Mr O'Reilly finds that residents have "every right to express their anger concern and frustration" at the fact "they were let down" [Executive Summary] yet makes no significant findings apportioning responsibility for the incident itself, and the delay in warning residents. Someone needs to be accountable for what occurred.

Twice in the Executive Summary it is stated that the incident posed "no health risk to residents". The health researchers (including the final report of NSW Health) have never stated this. The distinction between 'no health risk' and 'highly unlikely' is not lost on the residents of Stockton. The health assessments are based on statistical modelling. While we are largely relieved at the health findings, no-one (except Mr O'Reilly) has ever guaranteed that no person will get sick as a result of what occurred.

We feel that the recommendations in the Report do not go far enough.

In Recommendation 2, it is recommended that in future, "the community engagement system will be activated immediately the incident becomes known". This recommendation refers to a "hazardous material spill, which is not confined to the

plant and impacts on neighbours..." The incident that occurred on 8 August 2011 was deemed by Orica to be a "local" incident for many hours after the spill.

If a similar incident occurred in the future, Orica could again misdiagnose the problem and the public would still not be informed.

In Recommendation 9, there is mention of developing a "Precinct Plan, similar to the Botany Bay Precinct Emergency Sub Plan". The Stockton Community Action Group understands that a Hazardous Materials/Chemical, Biological, Radiological (CBR) Sub Plan supports the response to any future incidents/emergencies. We further understand that some of the actions of the Sub Plan would be evacuations of Stockton, closure of facilities on Kooragang etc.

The community should have access to full details of such Sub Plan / Precinct Plan as related to various levels of an incident/emergency response for Stockton, including communication with residents.

There remains very little confidence within the community that the level of communication or understanding of their communication requirements from either Orica or Government Departments through the PIFAC have progressed since the incident. The Stockton Community Action Group believes that there must be genuine community consultation in the development of the Sub Plan / Precinct Plan.

RECOMMENDATION:

There is a need for greater transparency and community involvement in matters that directly relate to the health and well-being of the greater Newcastle Community.

d) Any other related matters arising from these terms of reference

i) Concern regarding potentially catastrophic mix of current, approved and proposed industries working within a small area on Kooragang Island:

The Stockton Community Action Group is very concerned about the cumulative mix of dangers coming from current and proposed future industries on Kooragang Island.

Existing industries on Kooragang Island are: Woodchip Terminal, Hi Fert/ Incitec Pivot Fertilizer (Storage and Distribution), Cargill Linseed Procession (Canola), 3 coal loaders and terminals, Boral Cement Manufacture and Distribution, Orica Chemical Manufacturing Facility and Pacific Carbon (Coke manufacturing), Simsmetal and Cleanaway.

Proposed industries that we are aware of for Kooragang Island are: Kooragang Island Bulk Liquids Storage Facility (Marstel), Coal Seam Gas (CSG) Export Terminal (Eastern Star), Liquid Natural Gas (LNG) Export Terminal (Eastern Star), 4th coal loader and terminal, Orica expansion (approved 75% expansion), Incitec Ammonium Nitrate Plant.

The Stockton Community Action Group believe that having such a potential mix of industries on this site poses a great hazard to many communities in and around Newcastle, including the communities of Stockton, Fern Bay, Mayfield, Honeysuckle, Carrington and Newcastle East. Apart from normal “accidents” as occurred on 8 August 2011 involving one industry, there are significant potential hazards if there was an incident affecting more than one industry on the island. Such incidents might include earthquakes, mine subsidence, an explosion or being seen as a “target”.

The Stockton Community Action Group believes that when planning approvals are made, these considerations need to be taken into account.

ii) Production and Storage of Dangerous Explosives Close to Communities:

Ammonium nitrate which is used in the production and storage of explosives is itself a dangerous oxidant that has is a potential fire and explosive hazard, with significant potential deaths and injuries in surrounding communities. This is a major concern to the Stockton Community Action Group. For example, several years ago in Toulouse an ammonium nitrate plant exploded killing hundreds of people and injuring thousands. Such plants should be located well away from communities and certainly not less than a kilometre from residents.

iii) Concern regarding competence of technical people working within the Office of Environment and Heritage who deal with local complaints

There have been reports of Stockton people calling the EPA Pollution Hotline for a number of years with no feedback from the Office of Environment and Heritage (OEH) on the complaints. Following the Orica incident, the OEH now provide response to the EPA hotline pollution complaints, however, at times there is erroneous information from the Office. Such information includes suggestions that there are no worldwide regulations for PM2.5 levels, which in fact is incorrect. Recently however, the EPA's response to complainants on the EPA Pollution Hotline is becoming more efficient.

iv) Other Pollution from Orica

As well as the dangerous carcinogenic release from the incident, Orica continuously releases nitrous oxides, nitrogen dioxide, PM2.5 particles and PM10 particles, sulphur dioxide and also has accidental releases of ammonia into the surrounding communities. This is a major concern to the Stockton Community Action Group in that these levels are not widely published and are not effectively measured in surrounding communities.

As well, two of the most dangerous pollutants being emitted from Orica are not regulated and have no licence conditions. This is in respect to the very dangerous small PM 2.5 particles coming from the Prill tower (there is no safe limit for PM2.5 particles) and nitrogen dioxide coming from the nitric acid plants. While total nitrous oxides have a licence condition for the three nitric acid plants of 850 mg/L (sum of each of the three

plants limits), which in itself is very high, there is no limit for the most dangerous nitrous oxide, which is nitrogen dioxide. This is highly alarming.

The Stockton Community Action Group consider it is imperative to have limits placed on Orica for nitrogen dioxide and PM2.5 and PM 10 particles and that these be set at world's best practice as evidenced in countries such as Germany and the US.

Monitoring data that is up to date and believable is critical in gaining the community's confidence. At the time of the Orica incident the latest readings available from Orica or the Newcastle City Council's web sites was May 2011. The data is months old and has a major error. A copy of the web site is shown in an Appendix 1 but is summarised as follows for PM10 readings.

- Jan 12
- Feb 11
- Mar 10
- Apr 22
- May 18

YTD 6.08

Clearly the year to date average must be between the lowest and the highest readings and the quoted value of 6.08 appears to have been obtained by dividing the 5 values by 12 and not by 5. Such errors do little to give the community confidence.

Rigorous monitoring at the plant and in the surrounding communities should be established and provided as real time information on a website for access by the community.

RECOMMENDATIONS:

There is a need for immediate, effective and transparent environmental monitoring (including air and water).

It is imperative to have limits placed on Orica for nitrogen dioxide and PM2.5 and PM 10 particles and these must be set at world's best practice.

v) Emergency Alarm

It is a concern that when there is an event and the emergency services are contacted, it could be still 30 minutes to a couple of hours before residents are aware to take action from a dangerous or toxic event from the Orica factory. There is a need for an audible alarm. The existence of this alarm and response procedures must be regularly advertised. An audible alarm for the isolated community of Stockton would alert people to a potentially dangerous situation, encouraging them to go indoors and await/seek further emergency response information. As there are extremely limited evacuation routes (one road in and out), this alarm should be used for any potential emergency situation that may occur on Kooragang Island or any other emergency affecting the Stockton community.

vi) Information requests

The Stockton Community Action Group requests the following:

- To support the dissemination of community information, we request the MSDS list of chemicals used within the Orica site and email updates with MSDS sheets as new chemicals are added to the site.
- A Stockton Community Action Group representative be involved in some capacity in the MOU communications between OEH and FRNSW for Orica or for all Industries on Kooragang Island
- Inclusion of a Stockton Community Action Group representative on the EP&R Group Independent Board.
- A Community Reference Group is established for Kooragang Island. The Stockton Community Action Group would request inclusion this group.

References

O'Reilly, B., (2011) *A review into the response to the serious pollution incident at Orica Australia Pty. Ltd. ammonium nitrate plant at Walsh Point, Kooragang Island on August 8, 2011*, NSW Department of Premier and Cabinet, NSW. Viewed on 30 October 2011, at <http://www.eeo.nsw.gov.au/?a=131160>

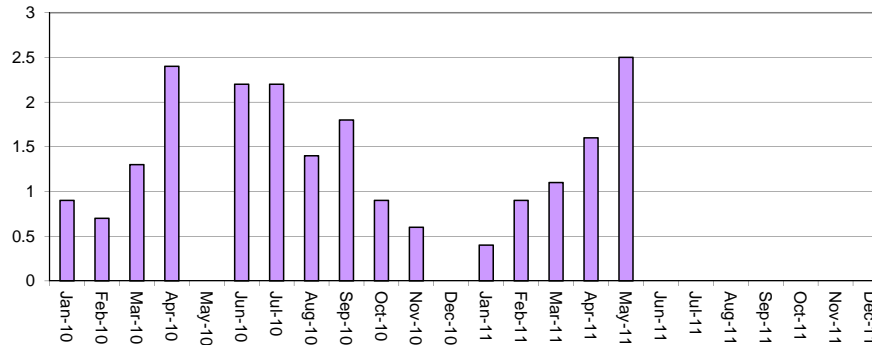
Appendix 1: Relevant monitoring data from Orica via Newcastle City Council Website



STOCKTON MONITOR - NOx
Months PPHM

Jan-10	0.9
Feb-10	0.7
Mar-10	1.3
Apr-10	2.4
May-10	
Jun-10	2.2
Jul-10	2.2
Aug-10	1.4
Sep-10	1.8
Oct-10	0.9
Nov-10	0.6
Dec-10	
Jan-11	0.4
Feb-11	0.9
Mar-11	1.1
Apr-11	1.6
May-11	2.5
Jun-11	
Jul-11	
Aug-11	
Sep-11	
Oct-11	
Nov-11	
Dec-11	

STOCKTON MONITOR - NOx

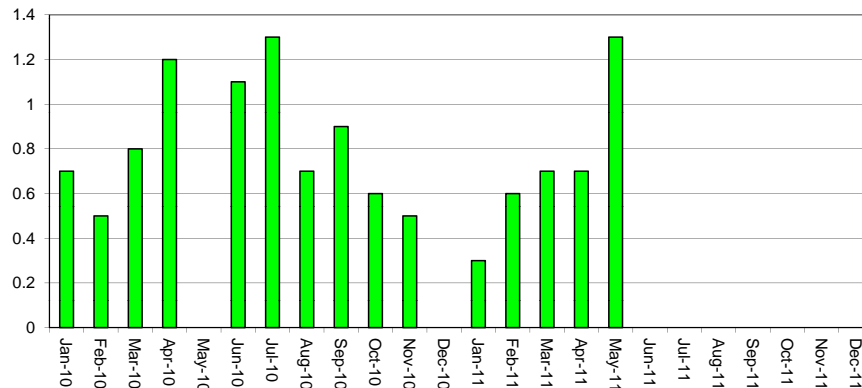


Comments: No report from Aurecon for NOx and NO2 for May

STOCKTON MONITOR - NO2
Month pphm

Jan-10	0.7
Feb-10	0.5
Mar-10	0.8
Apr-10	1.2
May-10	
Jun-10	1.1
Jul-10	1.3
Aug-10	0.7
Sep-10	0.9
Oct-10	0.6
Nov-10	0.5
Dec-10	
Jan-11	0.3
Feb-11	0.6
Mar-11	0.7
Apr-11	0.7
May-11	1.3
Jun-11	
Jul-11	
Aug-11	
Sep-11	
Oct-11	
Nov-11	
Dec-11	

STOCKTON MONITOR - NO2



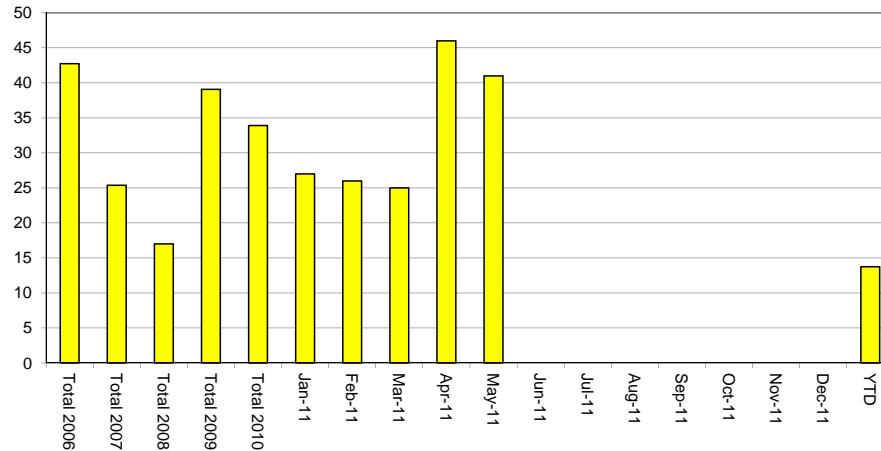
Comments: NHMRC Long Term Goal is not greater than 5 pphm



STOCKTON MONITOR - TOTAL SUSPENDED PARTICULATES

	ug/m3/air
Total 2006	42.75
Total 2007	25.38
Total 2008	17.008
Total 2009	39.08
Total 2010	33.92
Jan-11	27
Feb-11	26
Mar-11	25
Apr-11	46
May-11	41
Jun-11	
Jul-11	
Aug-11	
Sep-11	
Oct-11	
Nov-11	
Dec-11	
YTD	13.75

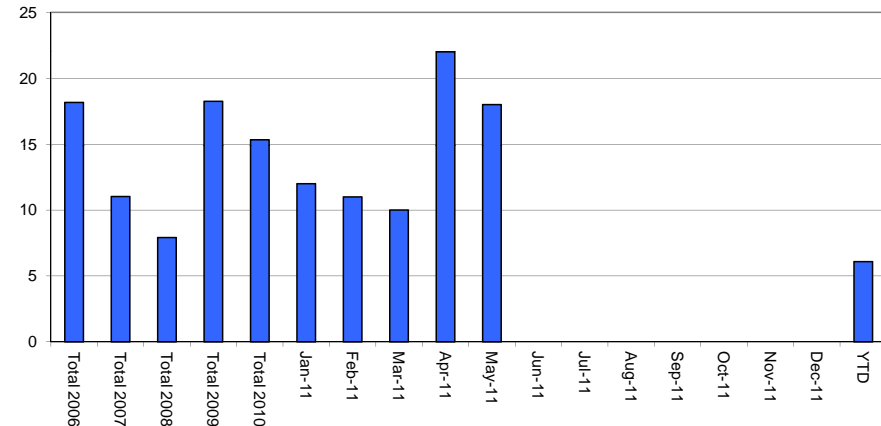
STOCKTON MONITOR - TOTAL SUSPENDED PARTICULATES



NEWCASTLE CITY COUNCIL - PM10 READINGS

	ug/m3/air
Total 2006	18.167
Total 2007	11.03
Total 2008	7.916
Total 2009	18.25
Total 2010	15.33
Jan-11	12
Feb-11	11
Mar-11	10
Apr-11	22
May-11	18
Jun-11	
Jul-11	
Aug-11	
Sep-11	
Oct-11	
Nov-11	
Dec-11	
YTD	6.08333333

NEWCASTLE CITY COUNCIL - PM10 READINGS



Annual Averages

Comments

PM10 sampler