

National Pollutant Inventory Conference – 10 years of NPI: Tracking pollution across Australia

Summary of presentations

Alex Taylor

Organisation: Department of the Environment, Heritage, Water and the Arts, National Pollutant Inventory

Topic: NPI Overview

Abstract/Presentation Outline:

The presentation will include a broad overview of the NPI program. Topics will include:

- What is the NPI?
- NPI legislation hierarchy
- Responsibilities of industry and government
- National Environment Protection Measure Variation 2007
- Thresholds
- Emissions estimation techniques
- Cleaner production
- Reporting
- Validation and quality assurance
- Public disclosure
- Continual improvements

Topic: NPI Online Reporting System

Abstract/Presentation Outline:

The NPI online reporting system was released in January 2008 for industry to report their emissions of NPI listed substances. This presentation will discuss the key features of the system including:

- Standardised nationally consistent validation
- Role based access to functionality
- Interaction with the DEWHA GIS
- Web service technology to interface with external systems, and allow for upload of calculated data

Andrew Mitchell

Organisation: Community member

Topic: Using Web 2.0 technologies to enhance community right to know

Abstract/Presentation Outline:

This presentation will examine the use of Google Earth for public dissemination of NPI data. Key topics will include:

- Technologies
- Cleaning and correcting data

- Analysing, summarising and comparing data
- Presenting and publishing data
- Publicising and attracting visitors to the site
- The future – what you can do

Brian Hooker

Organisation: Enerflex

Topic: Live fire training facility - smoke extraction system

Abstract/Presentation Outline:

This presentation is a case study concerning the use of an extraction and collection system for emissions from a fire training facility. Key points will include:

- Design considerations for the client – zero visible emissions and minimal fugitive emissions
- Facility limitations and structures
- Testing
- Implementation of the solution
- Post testing and enhancement to improve operability

Brownwen Butterfield & Sarah Kemp

Organisation: Department of Defence and Parsons Brinckerhoff

Topic: How Defence is using the EMS to integrate and deliver the desired environmental outcomes of the NPI

Abstract/Presentation Outline:

The Department of Defence will present on how the Defence Environmental Management System (EMS) is being implemented to meet the desired outcomes of the NPI National Environment Protection Measure (NEPM). Discussion will be given to the handling of high risk substances through the EMS.

Carl Novosad

Organisation: ECCO

Topic: NPI reporting assistance

Abstract/Presentation Outline:

This presentation will discuss the results of a national survey of NPI reporters conducted in 2006. The intention of the survey was to assess the current costs of compliance, as well as to determine the potential costs of reporting

transfers of NPI substances in waste. In addition to financial and waste management information, respondents also provided their opinion on the types of assistance (eg guidelines, manuals, workshops) that would be of most benefit. The presentation examines the results of the survey and some of the projects now underway to provide assistance to NPI reporters.

Ramses Zietek & Paul Quinn

Organisation: ECS Assist

Topic: FTIR technology and its ability to measure stack emissions for common reportable NPI compounds and the ability to perform R&D type analysis for unknown and difficult analytes

Abstract/Presentation Outline:

This presentation will discuss the use of Fourier transform infrared spectroscopy (FTIR) technology and its ability to measure stack emissions for common reportable NPI compounds, and additionally the ability to perform R&D type analysis for unknown and difficult analytes. This is important as many companies rely on old methodology to measure stack emissions where newer technology is available.

One example is with TRS compounds:

Typically these compounds are collected using gas bags where the sample immediately begins to degrade. With FTIR these compounds will be sampled directly into the instrument measured instantly onsite with no chance of losing sample.

Christine Williams

Organisation: Queensland Environment Protection Agency

Topic: NPI in QLD with an emphasis on the 'Clean and Healthy Air for Gladstone' project

Abstract/Presentation Outline:

Concerns have been raised by people living in the Gladstone area about the cumulative impact of air pollution from industry on the health and well-being of the community. 33 facilities reporting to the NPI are located in this area, making the program an important source of data to support decision making. To assess the impact of air emissions on the ambient air quality in the Gladstone area and the potential risks to human health associated with those emissions, the "Clean and Healthy Air for Gladstone" (CHAG) project has been

established in collaboration between the EPA and Queensland Health (QH).

Claire Penniceard

Organisation: The Pig Pen

Topic: Carbon farming – case study

Abstract/Presentation Outline:

Claire Penniceard is the owner of The Pig Pen, a significant business which grows out pigs in North East Victoria, on contract to service specialist export markets.

The enterprise was designed from the outset and has operated for eight years as an innovative working model of sustainable, Triple Bottom Line, accountable agriculture. The enterprise showcases exemplary environmental, animal welfare and production outcomes, and has a national reputation for excellence in the Australian pork industry. Claire has worked to develop a full environmental footprint for The Pig Pen and has benchmarked it relative to other farming enterprises. The results are dramatic.

- Water and energy use are a fraction of traditional operational requirements.
- The Pig Pen is a continuing zero waste enterprise.
- The land footprint is tiny, and the enterprise is able to regenerate, every year, a greater acreage of land than is required for all its operational land in total, including land required for all the external inputs of the enterprise, such as feed grain.
- And emissions are negligible compared to other forms of agricultural production.

The total emissions from The Pig Pen are less than the carbon alone produced by the average Australian suburban household.

In the light of the imminent Carbon Trading Scheme datelines, the findings from this innovative approach are of increased significance for all farmers – and those who hope to access farm land for sequestration purposes.

Claudia Sauerland

Organisation: South Australian Environment Protection Agency

Topic: Using NPI data for comparative risk assessments

Abstract/Presentation Outline:

A small amount of a highly toxic substance may be of more concern than a larger emission

of a less toxic substance. Therefore we need to consider the amounts and the toxicity of the emitted substances when comparing the impacts of different pollutants. Such a potential impact can be expressed as a risk and used to assess potential human or environmental health threats from exposure to pollutants.

This presentation will examine the use of hazard scores to develop a risk assessment of point and fugitive sources within the Adelaide airshed.

Topic: Diffuse nutrient emissions to water
Abstract/Presentation Outline:

Nitrogen (N) and phosphorus (P) are important nutrients required to maintain the productivity of ecosystems. However, in excess, both nutrients can harm the ecology of waterways by causing algal blooms, which may also impact drinking water quality and recreational activities. Nutrients emitted to water come from both point sources and non-point (diffuse) sources. Point sources of nutrient emissions to water, such as wastewater treatment plants, report their annual emissions directly to the NPI. Diffuse pollution is estimated by the NPI as aggregate emission data (AED).

This presentation will examine the use of a dynamic water quality, rainfall and run off model for the Mount Lofty Range catchments.

Damian Edwards
Organisation: SRA Information Technology
Topic: Effective management of emissions data

Abstract/Presentation Outline:

This paper examines the process of gathering, consolidating, aggregating and calculating emission data. It aims to provide practical solutions, in a non-technical manner, for effective management of this data along with application of this data including:

- legal compliance
- risk mitigation
- performance improvement

In addition to the process aspect of emission data management, available technologies are discussed with examples provided from sectors, such as mining, to illustrate the application of these technologies.

From these examples, characteristics of an effective data management solution are described providing attendees with a practical

guide to selecting a suitable and effective emission data management solution.

Damian Lovejoy
Organisation: Queensland Environment Protection Agency
Topic: Queensland EPA's Compliance Strategy: Applying Human Health Risk Scores for More Efficient Resource Allocation
Abstract/Presentation Outline:

Until recently, the Queensland EPA has prioritised compliance activities largely on the basis of complaints and local facility knowledge. A project to improve the system for targeting and prioritising compliance activities is currently underway. This project will introduce a high degree of scientific rigour to the process for planning compliance activities. Toxic Equivalency Potentials (TEPs) (developed through a combination of substance risk assessment (dose response testing) and environmental fate modelling) can be applied to National Pollutant Inventory emissions estimates and facility risk can be ascertained. By overlaying facility risk score with population density and vulnerability, the Qld EPA will be able to confidently prioritise and rank facilities based on their risk to human health and consequently more effectively target its limited resources.

Dave Campin
Organisation: Queensland Environment Protection Agency
Topic: Environmental Emissions Profiles
Abstract/Presentation Outline:

An environmental risk profiling system for environmentally relevant activities has been developed to underpin compliance strategies of the Queensland Environmental Protection Agency (EPA). Initially conceived to replace the schedule of fees for environmentally relevant activities with the expiry of the Environmental Protection Regulation 1998, the profiles are also contributing to the development of priorities for the Agency's compliance program.

This presentation will discuss the mechanisms of the system, and outline its application to environmental regulation in QLD.

**Topic: Benchmarking Industry
Abstract/Presentation Outline:**

The Environmental Protection Agency and Queensland Health have embarked upon a joint study to identify potential links between atmospheric industrial emissions and health outcomes in the Gladstone/Calliope Shires, in response to an anomaly in the expected frequency of chronic lymphatic leukaemia in the population of those shires.

Rather than rely solely upon the NPI data provided by industry in the region, data from other pollutant release and transfer registers (PRTR) were considered in detail; these included pollutant release data from the National Pollutant Release Inventory (Canada), the Toxics Release Inventory (USA) and the European Pollutant Emissions Register (European Union) were used. Across the full range of activities in the air shed, some 230 substances have been identified as likely to be emitted to the atmosphere from industry.

Benchmarking reports on aluminium smelting and black-coal-fired power stations have been released, with others in preparation. The benchmarking reports have been used by Queensland Health in their development of a list of key pollutants as a focus for a survey of health outcomes in the Gladstone/Calliope communities.

**Debbie Lawrence
Organisation: Department of the
Environment, Heritage, Water and the Arts
Topic: International PRTR Update
Abstract/Presentation Outline:**

Debbie recently represented Australia at a meeting of the OECD Pollutant Release Transfer Register (PRTR) taskforce. The presentation will focus on international developments in PRTR's, and will include examples of what is being done and achieved where these programs operate.

**Dylan Marks
Organisation: Greenbase
Topic: Emission Impossible
Abstract/Presentation Outline:**

In late 1998 Greenbase was approached by the Sons of Gwalia mining company with a request to "build a database to do their National Pollutant Inventory reports". At the

time, we had no knowledge of the NPI and we were sceptical that the Government would implement such a far-sighted initiative in the climate of the day.

After a few discussions and some research we came to realise that the NPI was real and was here to stay. The eventual result of our initial work with Sons of Gwalia was not a database per se but a comprehensive emissions accounting & reporting service.

Over time, the Greenbase system has evolved into a complex and robust internet based SQL server application. The Greenbase system continues to be adapted & streamlined as the requirements for the NPI change, and our clients become more accustomed to what can be achieved through active participation on their part.

**Elizabeth O'Brien
Organisation: The Lead Group
Topic: So you want to use the NPI to know
and compare heavy metal emissions by
source? Good luck with that!
Abstract/Presentation Outline:**

Elizabeth will present a community information service user's findings on how the NPI process fails to estimate (at all) numerous sources of emissions to land, air and water of lead and other heavy metals, and on how it fails to estimate accurately or fairly those it does report on. Using "perceived risk" in order to rank the 90 NPI substances will be compared to using environmental health information to prioritise hazardous substances.

**Geoff Latimer
Organisation: Victoria Environment
Protection Agency
Topic: Communicating risk and the NPI
Abstract/Presentation Outline:**

Upon the release of NPI data, articles often appear in the media highlighting perceived environmental issues in a given area. With a focus on Victoria, Geoff will look back at some examples of where this has occurred in the past. Using lessons learned, Geoff offers some key strategies for briefing the media to facilitate accurate reporting and usage of NPI data.

Ian Rae

**Organisation: University of Melbourne /
Chair of the NPI Technical Advisory Panel
Topic: Risk assessment and the NPI
Abstract/Presentation Outline:**

Faced with the task of preparing a list of substances for the National Pollutant Inventory, the Technical Advisory Panel adopted a risk assessment methodology based on the simple equation:

$$\text{RISK} = \text{HAZARD} \times \text{EXPOSURE}$$

The methodology served us well and has proved gratifyingly robust and therefore durable. There have been few changes to the NPI reporting list, and the methodology has been used for other chemical assessments. The list that we presented to the Ministers, in which chemicals ranked by risk, made a powerful case and our advice was accepted. The Ministers also accepted advice about selection of a cut-off point - in the event, there were two cut-off points to allow staged introduction of reporting - and about not giving unwarranted precedence to 'politically active substances'.

The same methodology based on toxicology, observed occurrence and expert judgment, was used in the process of selecting substances for Tier 2 of the Air Toxics National Environment Protection Measure.

Kevin Finn & Gary Stone
Organisation: Primo Small Goods
Topic: Optimal ozone technology for the purposes of: waste recycling, bacteria reduction, energy (hot water) minimisation, and reduction of chemical usage
Abstract/Presentation Outline:

Optimal Ozone Outcomes have been researching and developing our patent pending Micromix technology for the past 4 years. The technology is based on the use of ozone as a bactericidal for the purposes of killing/reducing bacteria load on surfaces, in CIP systems, in water and on animals prior to slaughter.

The advantages of using the Micromix technology are extensive in relation to the environment as well as OHS.

- No hot water is used reducing greenhouse emissions

- No chemical residues go to the soil or drain as ozone reverts to oxygen from where it came.
- No OHS issues with the equipment being fitted with audible and visual sensors for any possible situation.
- NO chemicals are being stored or used
- No danger to personnel due to chemical leaks or incorrect use
- Elimination of odours on plant and in drains
- Elimination of flies if sprayed around the affected areas
- Less build up in boiler piping for producing hot water required in other areas of the plant as there are no chemical residues to create scale
- Recycling of water used in conjunction with filtration realizing substantial savings in water used on plant
- Washing of cattle prior to slaughter thereby reducing the bacteria entering the plant.

Keith Blyth

Organisation: Creative Custom Strategies
Topic: Managing relationships between the community, industry and government - what do you do when you come into conflict
Abstract/Presentation Outline:

This presentation will focus on two key issues:

- Issues Management when there is an issue – Generally, a situation where there is an issue that requires some form of response from the company or business. For the purpose of the discussion, the assumption is made that the company must respond.
- Issues Management Strategies – This does not need a crisis to be the catalyst for planning and action. Requires a stronger management perspective – removes the reactionary element out of Issues Management. Discussion will be along the lines of drafting, allocating resources, reviewing and implementing a Management Strategy.

The critical element to be considered is the message – what do you want the community to understand about your business and responsibilities and actions as a corporate citizen?

Kellie Rinaldi

Organisation: Sinclair Knight Merz

Topic: An investigation into shipping emissions arising from a major port using an emission inventory approach

Abstract/Presentation Outline:

Sinclair Knight Merz has undertaken an emission inventory of the Port Hedland area to gain an understanding of the potential changes in diffuse emissions from the main mobile emission sources in the study region, as part of an assessment into the cumulative effects of future port expansions.

The results of the emission inventory highlight the significance of emissions from shipping operations and therefore the need for these to be accurately quantified and included in future air quality assessments.

Kelsey Bawden

Organisation: Pacific Air and Environment

Topic: Utilising NPI data to supplement a NSW greater metropolitan regional air emissions inventory

Abstract/Presentation Outline:

Recently, Pacific Air & Environment (PAE) developed the inventory of air emissions from industrial and commercial facilities for the NSW Department of the Environment and Climate Change. The industrial and commercial emissions inventories feed into the recently developed new air emissions inventory for the NSW Greater Metropolitan Region (GMR).

This paper describes the resources sourced from the NPI program to develop methodologies to estimate air emissions from industrial facilities, how data was used from the NPI database to supplement missing activity data and describes the development of an emissions estimation database that calculates source-specific emissions based on published NPI techniques using activity data.

Lidia Morawska

Organisation: Queensland University of Technology

Topic: New approach to regulations on ambient particulate matter: PM1 and PM10.

Abstract/Presentation Outline:

Current ambient air quality standards are mass-based and restricted to PM2.5 and PM10 fractions. The major contribution to both

PM2.5 and PM10 fractions is from particles belonging to the coarse mode and generated by mechanical processes. These standards are thus unable to effectively control particle concentrations from combustion sources, such as motor vehicles and power plants, which tend to emit very small particles that are almost entirely respirable and in the submicron range, and dominate the nucleation and accumulation modes, which contribute much less to particle mass concentration. The aim of this work was to examine whether PM1 and PM10 would be a more effective combination of mass standards than PM2.5 (dominant in the nucleation and accumulation modes) and PM10 (dominant in the coarse mode) in controlling combustion related ambient particles, as well as those originating from mechanical processes.

Mariann Lloyd-Smith

Organisation: National Toxics Network

Topic: Australia's NPI – has it served the community right to know?

Abstract/Presentation Outline:

In 1994, in a spirit of optimism, the now defunct Commonwealth Environment Protection Agency released a Public Discussion Paper on a proposed National Pollutant Inventory (NPI) for Australia. The discussion paper was well received and enthusiasm for such a reporting system was high. Yet by the end of the decade, civil society was left wondering, “What was all that about?” and for those closely associated with the NPI consultative process, a sense of disillusionment reigned. The subsequent NPI National Environment Protection Measure (NPI NEPM) was described by Greenpeace as a voluntary, second-rate environmental measure and a “betrayal of the Australian community’s ‘right to know’ about pollution,”. The National Toxics Network (NTN) has been involved in the development of the NPI since its inception and was a member of the Commonwealth NPI Reference Group. In 1995, on behalf of the Commonwealth Environmental Protection Agency, members of NTN undertook, “Investigations and Recommendations for Community Information Needs & Delivery for the National Pollutant Inventory”. This paper will review the community expectations, plus the findings and recommendations of that report in light of the current NPI and recent changes to industry reporting.

Brad Currell

Organisation: Albany International
Topic: Star-Bags™ – maximising benefits in emission reduction with existing equipment via innovative technology
Abstract/Presentation Outline:

Historically the hydrogen fluoride laden fume emitted from the electrolytic cells in the aluminium reduction process is further treated in pulse jet fabric filter dust collectors.

Patented Star-Bag™ technology is being used in aluminium smelters in Australia to increase the dust collection and fluoride scrubbing capacity of existing collectors. This technology provides an alternative to major capital equipment upgrade, and potentially lowers the production cost per tonne of aluminium where capacity limitations are being realised and production expansion is required.

This paper presents the findings of on-site pilot scale, and full production scale comparative tests, highlighting the operational and variable differences observed utilising the Star-Bag™ technology at aluminium smelters in Australia. The results illustrate how this technology can be utilised to increase the hydrogen fluoride scrubbing efficiency and dust collection capacity of existing capital equipment. Presented also is the most recent process efficiency gains at a major aluminium smelter subsequent to the complete conversion of the smelter gas treatment centres to Star-Bag™ technology.

Nick Agapides

Organisation: NSW Department of the Environment and Climate Change
Topic: A new air emissions inventory for the greater metropolitan region in NSW
Abstract/Presentation Outline:

The NSW Department of Environment and Climate Change (DECC) has developed a new air emissions inventory for the 2003 calendar year, incorporating the Greater Metropolitan Region (GMR) in NSW.

The air emissions inventory is a detailed listing of pollutants discharged into the atmosphere by each source type during a given time period and at a specific location. The study area covers 57,330 km², which includes the greater Sydney, Newcastle and Wollongong regions,

known collectively as the Greater Metropolitan Region (GMR). Approximately 76% of the NSW population resides in the GMR.

The inventory includes emissions from biogenic (i.e. natural) and anthropogenic (i.e. human) derived sources for over 90 air pollutants.

This paper provides an overview of: the methodologies used to develop the air emissions inventory; some key findings; and specific features contained within the Emissions Data Management System V1.0

Paul Kesby

Organisation: Department of the Environment, Heritage, Water and the Arts
Topic: Using the NPI to improve air quality
Abstract/Presentation Outline:

The NPI can be a useful tool to support decision making on air quality management at the national level and has been used to inform the development and assessment of a number of national initiatives to improve air quality. Specifically, the NPI has been used to:

- Identify potential sites where air quality monitoring may be required
- Determine priority emission sources for abatement action *and*
- Characterise exposure to air toxics, as part of the prioritisation of additional pollutants to be considered for inclusion in the Air Toxics NEPM.

In addition to the above national actions, NPI emissions data was used in the Australian Government's Launceston Clean Air Industry Program to target those industries with the greatest potential for improved emissions performance.

The value of the NPI as an air quality management tool is dependent on the quality of the emissions estimates, which can vary according to the estimation technique used and source data. The Australian Government has commissioned research through its National In-Service Emissions program to better characterise emissions from in-service petrol vehicles. Work is also underway to determine emissions from in-service woodheaters. These studies will improve the accuracy of NPI estimates from these sources and better inform the development of national air quality initiatives.

Peter Firth & Natalie Madden
Rio Tinto Aluminium
Topic: Resourcing NPI Data Gathering at
RTA Yarwun Alumina Refinery
Abstract/Presentation Outline:

Rio Tinto Aluminium's (RTA) Yarwun Alumina Refinery has been operating since 2004; however, method for collecting, collating and reporting air, water and soil emissions was not finalized between RTA and the Qld EPA until late 2007.

This was around the time that the Clean and Healthy Air for Gladstone Study was being scoped. RTA Yarwun's Environment Team pre-empted the Qld Environment Protection Agency's move towards considering the value of measured emission data over calculated data, with reference to the chemical compounds likely to be required to be reported to Qld EPA in 2008 with some high degree of accuracy.

A review of the stack emission methods, environmental data quality and a comparison of calculated data versus actual measured emission data indicated that there was value in expanding the stack emission sampling across all emission points, but there were some gaps in technical knowledge about some of the metals and volatile organic compounds in the digestion process in the alumina refinery at Yarwun that were unique in Australia. The Environment Team at the RTA Yarwun refinery consulted other refineries, other industries in Gladstone, and the Alumina Industry Air Environment Forum membership, in addition to the on site Technical experts, and Air Specialists in the Environmental Protection Agency, to develop an accurate method of gathering NPI data for the calendar year report required to be presented to the Qld EPA 31 March 2008.

The method involves using stack emission sampling and analysis and process information management system, and aligning the Technical and Environmental Teams on the same program to prepare, review and report emissions to air, water and land and utilizing the bauxite quality until such time as the digestion process chemistry at the refinery is understood.

This paper presents the extent of professional disciplines and hours required to gather the 2007 NPI data and provide the NPI report.

Peter Thorning
Organisation: Queensland Environment
Protection Agency
Topic: History and purpose of the NPI
Abstract/Presentation Outline:

The National Pollutant Inventory has been in operation for 10 years. The NPI had its origins in overseas inventories such as the Toxics Release Inventory in the US and triggers in Australia, such as the Coode Island fire, which led to its development and implementation. The numbers of reporters has grown from 1200 in the first year of reporting to around 4000 now. The number of substances in the reporting list has grown from 36 in the first year to the current 93. Recent changes have seen the introduction of reporting on substances being transferred in addition to those being emitted. Emphasis has been on quality as well as increasing the scope of reporting and this has meant that significant changes have been made to the reporting forms and the guidance materials available. This paper will present a brief history of the NPI and a timeline showing significant developments.

Organisation: Griffith University /
Community Member
Topic: Community knowledge and use of
NPI
Abstract/Presentation Outline:

In Australia, the National Pollutant Inventory (NPI) commenced in 1998 and the first reports were published on the Internet (www.npi.gov.au) in 2000. Nine years of annual emission data on 90 substances from 4000 of the most significant pollutant emitters in Australia has been collected and published. Reporting to the NPI is mandatory if a facility exceeds certain thresholds relating to substance usage, fuel or waste burning or emissions to the environment. Like many other Pollutant Release and Transfer Registers (PRTRs), the NPI was established with Community Right to Know (CRTK) cited as one of the drivers. It therefore follows that the success of the NPI, and other PRTRs, is at least partly dependent on community knowledge and use of the information in the PRTR. Despite this, apart from the numerous case studies reported by the Working Group on Community Right-to-Know in the United States of America, there is little evidence in the literature of comprehensive analysis of the level of

knowledge and use of PRTRs by members of the community. The question about the level of knowledge and use of PRTRs is particularly relevant in Australia as there is anecdotal evidence suggesting that the NPI has been embraced less enthusiastically by environment groups than has been the case with some overseas inventories. This paper will present the findings of a survey of the general community and members of pro-environment community groups in Australia concerning the NPI. The survey sought information about individuals' knowledge and use of the NPI and on the organizations awareness of the NPI and whether it had used information from the NPI to plan or conduct actions against reporting facilities. It also sought information regarding barriers to community knowledge and use of the NPI. The results of the survey revealed that knowledge and use of the NPI was significantly higher than anecdotal evidence would suggest but that significant barriers exist which limit community knowledge and use of the NPI.

Peter Woods & Tony Truman
Organisation: Sustainable Infrastructure Australia
Topic: The use of biofilters for pollution mitigation in a Sewage Treatment Plant
Abstract/Presentation Outline:

Barwon Water, a statutory authority, is the largest regional water authority in Victoria. It provides quality water and sewerage services to a permanent population of 250,000 people. Its area of responsibility covers more than 8,100 square kilometres.

Barwon Water urgently needs to develop a sustainable programme for the treatment and beneficial use of biosolids. Without a sustainable biosolids management programme Barwon Water may not be able to meet its EPA licence requirements at BRWRP nor its statutory responsibilities to its customers or the environment.

This Project is strategically important for Barwon Water and the communities it serves and represents an exciting opportunity for Barwon Water to work with the private sector to deliver a project of State importance. Barwon Water seeks to address the need for a sustainable programme by requiring a solution that:

- Processes all biosolids produced by Barwon Water
- Uses any product from the biosolids treatment process in a beneficial way
- Meets all relevant EPA and other guidelines and laws *and*
- Appropriately addresses the concerns of the relevant local communities in the Geelong region.

SIA's role is to provide designs for three emission control systems aimed at eliminating off-site odour effects and reducing gaseous emissions to acceptable limits, with the additional aim of conserving energy and water resources.

Richard Sharp
Organisation: Sinclair Knight Merz
Topic: Australia's desalination industry
Abstract/Presentation Outline:

In October 2007, the Department of the Environment and Water Resources commissioned a report into the Australian desalination industry's possible reporting requirements under the National Pollutant Inventory (NPI).

The report confirmed that some information existed about environmental pollutants that are emitted from desalination facilities in Australia and that some of this was already reported in the NPI. The report also highlighted that there was likely to be a considerable expansion in the next few years in the number of medium to large desalination facilities in Australia, each of which may have an impact on the environment. The report suggested that existing emission estimation techniques are likely to be insufficient to assist the Australian desalination industry report emissions of listed substances to the NPI on the basis that processes within a desalination facility are variable and complex and are often entwined with other industrial processes including potable water treatment and wastewater treatment.

Robert Evans

Organisation: Botany Industrial Park

Topic: NPI reporting from Botany industrial park

Abstract/Presentation Outline:

Botany Industrial Park (BIP) is the largest chemical complex in NSW, occupying some 104 ha in eastern Sydney. It is the Sydney home for the Qenos polythene manufacturing facilities, the Huntsman Surfactants Plant and the ChlorAlkali and Groundwater Treatment Plants operated by Orica.

Emissions and transfers derive from a wide range of activities, including:

- Combustion of coal and gas
- Thermal cracking of hydrocarbons
- Reverse osmosis purification of waters
- Polymerisation
- Electrolysis of brine
- Direct reaction of hydrogen and chlorine to make HCl
- Management of contaminated soils
- Remediation of contaminated groundwaters
- Manufacture of ethylene oxide and its derivatives
- Large-scale storage of refrigerated liquefied hydrocarbon gases

Each year, BIP Pty Ltd prepares four NPI reports, reflecting the NSW DECC industry groupings. Nearly 50 substances are reported, making the BIP's reporting activity among the most comprehensive across Australia.

This paper will present the calculation protocols adopted since the early 1990's – initially as Cleaner Production tools and later to provide NPI and LBL statistics. Such protocols depend in large measure upon direct measurement and stoichiometry. Many substances make use of continuous measurement systems. The extension of the NPI to include transfers will utilise data sets that have been collected since the early 1990s.

Robin Ormerod

Organisation: Pacific Air and Environment

Topic: Uncertainty and quality issues surrounding NPI data: implications and remedies

Abstract/Presentation Outline:

All emissions data reported in the NPI are subject to some degree of uncertainty.

Uncertainty in emissions data can have important implications, for example in assessing projects for approval, in benchmarking the emissions performance of facilities against comparable industries or in evaluating trends in emissions over time.

A hierarchy of emissions estimation techniques (EETs) exists ranging from continuous emissions monitoring (CEM) through emission factors to engineering judgement. Emission factors are very widely used in NPI reporting. The various types of EETs potentially yield differing levels of uncertainty in emissions estimates, with the usual expectation that CEM will provide the most accurate data and engineering judgement the least accurate.

However, regardless of the EET applied, data quality can be seriously compromised if robust quality assurance/quality control (QA/QC) procedures are not enforced. Good QA/QC practice will produce results that are only as good as the estimation technique as well as the quality of the data used for the estimate. An overall QC/QA program comprises two distinct components, i.e., systematic quality control (QC) procedures and external QA activities. Unfortunately, NPI data for individual facilities do not identify these aspects, so the level of uncertainty is essentially unknown in most cases.

Even with the most accurate and reliable NPI data, there are limitations that affect how the data can be used. For example, NPI emissions data are reported as annual totals, which can provide a useful measure of performance, but they cannot provide the detailed source contributions and temporal variations that are necessary for detailed impact assessment.

Roger Drew

Organisation: Toxicos

Topic: The concentration of no toxicological concern for air toxics

Abstract/Presentation Outline:

Health risk assessments of industrial emissions often only concern themselves with the 'major' components in the emissions, usually just the criteria pollutants. Some risk assessments may extend the evaluation to include additional chemicals for which internet trolling has unearthed a guideline from somewhere. However estimation of the types and concentration of chemicals in industrial emissions, by analytical measurement for existing facilities or by NPI techniques for proposed facilities, show many different

substances may be present. For most of these chemicals health based guidelines do not exist, and there are no appropriate toxicological data (NHMRC 2006) which can be used to establish guidelines. Fortunately many of the components in the emissions are predicted by dispersion modelling to be present in a persons breathing zone at very small concentrations. Although not stated, it is on this rationale that the majority of health risk assessments conveniently ignore most of the chemicals in the emissions. This does not sit well with communities; knowing there are many more substances in the emissions they often ask "What about the health effects and risks of the rest of the chemicals"? The answer usually given is "the concentrations are very low and trivial so we don't have to worry about them" (!). But in a toxicological sense, what does trivial mean and how is it defined when there are no health data for the substance? Toxikos has developed the concept of a 'concentration of no toxicological concern' (CoNTC) that can be applied as a screening tool to legitimately dismiss substances whose ground level concentrations are predicted to be 'trivial' (Drew & Frangos 2007). The CoNTC helps define trivial. The derivation of the CoNTC, its validation and limitations will be confirmed, and it's utility as screening risk assessment tool presented through case studies.

Ross Yarwood

**Organisation: Western Australia
Department of Environment and
Conservation**

**Topic: Auditing of NPI reporters: the WA
experience**

Abstract/Presentation Outline:

The Western Australian NPI team conducts on-site facility audits on an annual basis. Audit targets are selected to cover a wide range of industry groups with no geographical barriers. The primary aim is to address reporting anomalies, but the process also further educates reporters in correct reporting procedures and gives opportunity for discussion of reporting difficulties. The NPI team also gains additional knowledge of industrial processes. Many reporting errors have been identified and corrected, and facilities have acknowledged the benefits of participating in an audit.

Russell Colman

Organisation: ATMECO

**Topic: Fugitives – rewards for good
information**

Abstract/Presentation Outline:

Fugitive leaks can be a significant contributor to overall mass emissions to the atmosphere for a facility, particularly in large complex plants with many potential leak sources. Reducing fugitive losses usually involves a low cost, low risk and a highly effective means of reducing emissions, but frustratingly regulators and companies often pay little attention to this area.

This presentation will cover a brief overview of NPI fugitive emissions methodologies as well as discuss overseas practice in leak control and reduction of fugitive emissions. A view of the leak status of a typical petrochemical plant will be considered, and options will be given to reduce fugitive losses.

Su Wild-River

**Organisation: Australian National
University**

**Topic: Improving estimates, identifying
hazards**

Abstract/Presentation Outline:

The Australian National University (ANU) estimates, reports, collects and uses NPI data. This paper outlines the benefits received by ANU from the NPI, including assistance in identifying hazards, and helping to set priorities for environmental risk reduction. It also identifies past challenges to estimating NPI results and presents the solutions used by ANU.

ANU strives to be a leader in environmental management. Formal environmental commitments include a 10-year Environmental Plan which wraps up in 2008. ANU is also a signatory to the Talloires Declaration for sustainability in higher education, the National Union of Students Sustainable Universities Charter and the Australian Greenhouse Challenge Agreement.

Researchers have used the NPI database for many purposes, such as the design of tools to assist quantitative environmental risk assessment. We note that in some cases it may be useful to report on the storage, as well as the release of pollutants.

Thien Nguyen

Organisation: ACT Government

Topic: Implementing the NPI in the ACT

Abstract/Presentation Outline:

Thien will present on the implementation of the NPI in the ACT Topics will include:

- An overview of Territory and municipal services activities, goals and objectives
- Legislative and administrative framework
- Main reporting industries and emission trends

Vijay Parate

Organisation: GCD

Topic: What matters is not just destruction efficiency & thermal efficiency of equipment but a complete system – new approach for high volume low concentration contaminated air streams.

Abstract/Presentation Outline:

A major automotive component supplier needed to control the emissions from its paint spray process. The plant emissions had characteristics common to many paint spray plants: high air flow, low volatile organic compound (VOC) concentration and particulate. The company needed an emission control solution that had low operating costs and that could also fit in their limited space. System reliability was a major design consideration; since the company is a synchronized delivery partner to the automobile industry, plant downtime or process delays result in expensive fines.