FINAL

Kwinana Ammonium Nitrate Expansion – Air Dispersion Modelling Report

Prepared for:
CSBP Limited
Kwinana, WA

Prepared by:
ENVIRON Australia Pty Ltd

Date:
04 November 2010

Project Number:
AS110489

FINAL

Prepared by:				**Authorised by:**			
Name:	Ruth Rogan			Name:	Brian Bell		
Title:	Environmental Scientist			Title:	Principal		
Phone:	+61 8 9225 5199			Phone:	+61 8 9225 5199		
Email:	rrogan@environcorp.com.au			Email:	bbell@environcorp.com.au		
Signature:		Date:	04/11/10	Signature:		Date:	04/11/10

VERSION CONTROL RECORD

Document File Name	Date Issued	Version	Author	Reviewer
AS110489 - CSBP Kwinana Ammonium Nitrate Expansion - Air Dispersion Modelling Report_100811_Final.doc	11 August 2010	Final Report	Ruth Rogan	Brian Bell/CSBP
AS110489 - CSBP Kwinana Ammonium Nitrate Expansion - Air Dispersion Modelling Report_100825_R1.doc	25 August 2010	Final Report Revision 1	Ruth Rogan	Brian Bell/CSBP
AS110489 - CSBP Kwinana Ammonium Nitrate Expansion - Air Dispersion Modelling Report_100830_R2.doc	30 August 2010	Final Report Revision 2	Ruth Rogan	Brian Bell/CSBP
AS110489 - CSBP Kwinana Ammonium Nitrate Expansion - Air Dispersion Modelling Report_1011XX_R3.doc	04 November 2010	Final Report Revision 3	Ruth Rogan	Brian Bell

Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

1.1 Background

CSBP Limited (CSBP), one of Australia's largest manufacturers and suppliers of high quality fertilisers and industrial and mining chemical products, is proposing to increase the ammonium nitrate production capacity at its Kwinana Industrial Complex, located approximately 40 km south of Perth, Western Australia.

CSBP's Kwinana Industrial Complex is licensed under the *Environmental Protection Act 1986* (Licence Number: L6107/1967), and includes the following production facilities:

Ammonium Nitrate Business:

- Integrated Nitric Acid Ammonium Nitrate Plants 1 and 2; and
- 2008 Ammonium Nitrate Prilling Plant.

Other:

- Superphosphate Plant;
- Compound Fertiliser Granulating Plant; and
- Ammonia Plant.

The 2008 Ammonium Nitrate Prilling Plant (also referred to as Prilling Plant 2) was commissioned by CSBP in 2008 and makes use of improved pollution control technology. This plant replaced CSBP's original Prilling Plant, which was decommissioned in 2009.

The expansion would involve the construction of a third integrated Nitric Acid Ammonium Nitrate plant (Plant 3), debottlenecking of the two existing Nitric Acid Ammonium Nitrate plants and proposed third plant, construction of a second auxiliary boiler and an upgrade of the existing prilling plant. The expansion project would result in an increase in the total ammonium nitrate production capacity at CSBP's Kwinana Industrial Complex from 520,000 tonnes per annum (tpa) to 936,000 tpa.

CSBP engaged ENVIRON Australia Pty Ltd (ENVIRON) to undertake air dispersion modelling in order to assess the potential air quality impacts arising from the atmospheric emissions and to support the environmental regulatory approval for the expansion project. The air dispersion modelling study has been carried out in two phases: the impact of emissions from existing sources at the CSBP Kwinana Industrial Complex was first assessed in order to establish a baseline of air quality impacts (baseline emissions scenario), followed by an assessment of emissions from the new and upgraded emissions sources in order to determine the air quality impacts associated with the increased ammonium nitrate production (expansion emissions scenario).

1.2 Purpose of this Report

This report outlines the approach, methodology and results for both the baseline and expansion emission scenarios. Ground level concentrations (GLCs) of nitrogen dioxide (NO_2), particulate matter (as $PM_{2.5}$) and ammonia (NH_3) have been predicted for all non-trivial sources of these pollutants at CSBP's Kwinana Industrial Complex.

Air quality impacts have been assessed for both the baseline and expansion emission scenarios, with each source operating under normal conditions, as well as with the Nitric Acid Plants operating under start-up and shutdown conditions. Ambient monitoring data have also been utilised in order to assess the cumulative impact of emissions associated with CSBP's operations along with other sources of emissions within the Kwinana area.

1.3 Site Description and Plant Layout

The CSBP Kwinana Industrial Complex is located in the Kwinana Industrial Area (KIA) approximately 40 km south of Perth. The CSBP Kwinana Industrial Complex encompasses an area of 138 ha and is adjacent to the intersection of Kwinana Beach Road and Rockingham Beach Road (Figure 1). A layout of the site is provided as Figure 2 and the locations of the emission sources considered in this assessment are highlighted in Figure 3.

2 Process Description and Emissions Control

Brief descriptions of the processes and emission control technologies utilised by the production facilities associated with CSBP's expansion project (i.e. Nitric Acid Ammonium Nitrate Plants 1, 2 and 3, the Auxiliary Boiler and the 2008 Ammonium Nitrate Prilling Plant) are provided in the following sections.

2.1 Integrated Nitric Acid Ammonium Nitrate Plants

The nitric acid process involves the production of oxides of nitrogen (NO_x) through the oxidisation of ammonia (NH_3) with air over platinum/rhodium gauzes to form nitric oxide (NO) (an exothermic reaction which generates heat and which is used to generate electricity). The NO is oxidised to NO_2 with additional air and is then passed through the absorber tower (the tallest part of the plant) where it is absorbed in water to create nitric acid (HNO_3). Unabsorbed NO_x gas leaves the absorber tower as tail gas which is treated prior to discharge to atmosphere via the Nitric Acid Plant Stack. The HNO_3 is then reacted in a pipe reactor with NH_3 to form ammonium nitrate; this part of the process does not produce any gaseous emissions.

Each of the Nitric Acid Ammonium Nitrate plants has been designed and operates in the same manner.

It should be noted that as there are no gaseous emissions from the ammonium nitrate manufacturing component of the integrated plant, this report will refer to emissions from the Nitric Acid plants only, to ensure consistency with Environmental Protection Act Licence (L6107/1967).

2.1.1 Emission Control

The untreated tail gas leaving the absorber tower has a NO_x concentration of approximately 800 ppm. Before being exhausted to atmosphere, the tail gas NO_x content is reduced in a selective catalytic reactor (SCR). In the SCR, the NO_x is reduced to N_2 via reaction with small quantities of ammonia. The treated tail gas, with a NO_x concentration of approximately 50 ppm is then released to atmosphere through the stack, which is mounted alongside the absorber tower. The treated tail gas also contains small concentrations of NH_3 (typically less than 1 ppm) as a result of slippage of NH_3 past the SCR.

NO_x concentrations from the SCR are measured continuously by an analyser located immediately upstream of the Tail-Gas Expander following the SCR and these are configured to alarm on high NO_x concentrations, and trip the plant if elevated NO_x concentrations are detected for a duration of greater than five minutes. Alarms are also configured to detect possible faults with the NO_x analyser and detect low NH_3 flow to the SCR. The SCR catalyst performance is monitored continuously with alarms and trips when not operating at acceptable activity. Shut down of the SCR leads to a plant shut down on high NO_x concentration alarm.

Elevated emissions of NO_x occur during the start-up process as the tail gas is heated to the operating temperature required for effective performance of the SCR catalyst (around 200ºC). This process takes around 30-minutes, after which time NO_x emissions decrease. Shutdown of the Nitric Acid Plants can also lead to elevated NO_x emissions as it takes time for NO_x to be cleared from the plant. Analysis of stack monitoring data for Nitric Acid Plants 1 and 2 provided by CSBP, indicates that start-up and shutdown conditions occur no more than four times a month. As NH_3 slippage is only associated with the operation of the SCR, NH_3 emissions from the Nitric Acid Plants are not expected during start-up or shut down conditions, when the SCR is offline.

The existing and proposed additional Nitric Acid Ammonium Nitrate plants will be debottlenecked as part of the expansion project in order to increase capacity and improve efficiency. This process is expected to result in an increase in the volumetric flow rate of emissions from the Nitric Acid Plants stacks to 39.5 m^3/s, which represents an increase of approximately 33% for Nitric Acid Plant 1, and 10% for Nitric Acid Plant 2.

2.2 Auxiliary Boiler

The existing auxiliary boiler is a natural gas-fired package boiler used to supply supplementary steam to the ammonia plant for use in the production process. The existing boiler has a steam generating capacity of 27 tonnes/hour. The new boiler proposed as part of the expansion project will have a steam generating capacity of 40 tonnes/hour. CSBP anticipates that once the new boiler has been commissioned, the existing boiler will no longer be required, except in the event of multiple plant trips that may require start up of the Ammonia Plant at the same time as one of the Nitric Acid Plants and for boiler maintenance (no more than 5% of the time).

2.2.1 Emission Control

The auxiliary boiler flue gas is vented to atmosphere via the Auxiliary Boiler Stack. Controlled gas to air ratio and flue gas oxygen analysis assists in optimising combustion.

It is anticipated that the volumetric flow rate of emissions from the new boiler will be 50% greater, based on the 50% increase in steam generating capacity, as compared to the existing boiler. However, the concentration of NO_x emissions in the waste gas stream is expected to remain the same as that for the existing boiler.

2.3 2008 Ammonium Nitrate Prilling Plant

In the Prilling Plant (which contains a large tower approximately 60 m tall) hot ammonium nitrate solution is pumped to the top of the prilling tower and sprayed at a temperature of between 140ºC and 150ºC into the void inside the tower, where it falls under gravity against a fan forced air stream. The liquid cools as it falls, and creates the small round prill. The prill are then dried in the pre-dryer(s) and dryer, cooled, screened and coated to provide raw material for use in the mining industry.

2.3.1 Emission Control

The prilling air is scrubbed by the prilling air scrubber to remove any vaporised NH_3 and entrained fine particulates. NH_3 and ammonium nitrate (NH_4NH_3) particulates are caught by the slightly acidified and pH-controlled dilute NH_4NH_3 solution. After scrubbing the prilling air is recycled to the bottom of the prilling tower by the prilling air scrubber fans.

Waste air from the pre-dryer, dryer, and screen and transfer points dust recovery is sent to the final scrubber (a two stage packed tower scrubber) to be washed to remove NH_4NH_3 particulates and NH_3. Bleed air from the prilling tower air circulation system is also passed to the final scrubber. The pH of the scrubbing liquor is controlled automatically to ensure efficient removal of NH_3. Failure of scrubbing liquor circulation will result in a plant shut down.

After treatment, the waste air is discharged to atmosphere via the final scrubber fan to the Prilling Plant Stack, which runs to a height above the top of the prilling tower. The water effluent from the scrubber is recycled through the plant to recover the ammonium nitrate.

The Prilling Plant will be debottlenecked as part of the expansion project in order to increase capacity and improve efficiency. This process is expected to result in an increase in the volumetric flow rate of emissions from the Prilling Plant stack by up to 25%. However, the scrubbing system has sufficient capacity to accommodate the increased volume and the concentration of NH_3 and PM emissions in the exhaust gas stream is not expected to increase as part of the expansion project.

3 Air Quality Criteria

3.1 Ambient Air Quality Guidelines

In June 1998 the National Environment Protection Council (NEPC) set uniform standards for ambient air quality to allow for the adequate protection of human health and well being. This was achieved via the creation of the National Environmental Protection (Ambient Air Quality) Measure (NEPM) (NEPC, 2003) which defined ambient air quality standards for criteria pollutants, including NO_2 and PM_{10}. The NEPM also sets Advisory Reporting Standards for $PM_{2.5}$, with a goal to gather sufficient data to facilitate a review of Standards as part of the review of the ambient air quality NEPM that is currently underway. The Western Australian State Government has adopted the NEPM standards for ambient air quality as part of the *State Environmental (Ambient Air) Policy 2009* (EPA, 2009) and the NEPM standards for NO_2, PM_{10} and $PM_{2.5}$ have subsequently been applied in this assessment.

The Victorian State Environmental Protection Policy (Vic SEPP) (Vic EPA, 2001) has established 3-minute average Design Criteria for a number of pollutants, including NH_3. The Design Criteria have been derived from the National Occupational Health and Safety Commission's (NOHSC) exposure standards for atmospheric contaminants in the occupational environment (Vic EPA, 2001) and are designed to protect against adverse health effects. The UK Environmental Agency (UKEA) has also defined Environmental Assessment Levels (EALs) for NH_3 which are derived from the UK Health and Safety Executive (HSE)'s Occupational Exposure Limits 2001 (UKEA, 2009). The UKEA criteria were referenced by the DEC in its assessment of monitored NH_3 concentrations collected as part of the Background Air Quality (Air Toxics) Study.

In the absence of a NEPM standard for NH_3, both the Vic SEPP and UKEA EALs have been applied in this assessment. The Vic SEPP 3-minute average Design Criteria has been converted to a 1-hour average concentration using the power law for timescale conversion, based on the approach recommended by Hanna *et al.* (1977). A summary of the air quality criteria applied in this assessment is provided in Table 1.

Table 1: Ambient Air Quality Criteria

Compound	Averaging Period	Concentration ($\mu g/m^3$)	Goal[1]	Source
NO_2	1-hour	246	Not to be exceeded more than 1 day per year	NEPC NEPM
	Annual	62	NA	
PM_{10}	24-hour	50	Not to be exceeded more than 5 days per year	NEPC NEPM
$PM_{2.5}$	24-hour	25	Goal is to gather sufficient data nationally to facilitate a review of the Advisory Reporting Standards	NEPC NEPM
	Annual	8		
NH_3	1-hour	330[2]	NA	Vic SEPP
		2,500[3]	NA	UKEA
	Annual	180[4]	NA	

Notes

1. From July 2008.
2. Derived from 3-minute average Vic SEPP (2001) design criteria and converted to 1-hour average using the 0.2 power law for timescale conversion, based on the approach recommended by Hanna *et al.* (1977).
3. Derived from 15-minute average Occupational Exposure Level and converted to 1-hour average by UKEA.
4. Derived from 8-hour average Occupational Exposure Level and converted to annual mean by UKEA.

3.2 Emission Limits

CSBP's Kwinana Industrial Complex currently operates under an Environmental Licence (L6107/1967/16) which contains emission limits and targets for NO_x, Total Particulates and NH_3 for a number of sources including the Nitric Acid Plants (operating under normal and start-up conditions), Granulating Plant, Ammonia Plant and 2008 Ammonium Nitrate Prilling Plant. A summary of the atmospheric emission licence conditions relevant to this assessment is provided in Table 2.

Table 2: CSBP Environmental Licence Atmospheric Emission Conditions

Source	Compound	Averaging Period	Emission Limit[1]
Nitric Acid Plants – Normal Operations	NO_x	1-hour	0.41 g/m^3
Nitric Acid Plants – Start-up Operations	NO_x	30-minutes	2.0 g/m^3
Granulating Plant Scrubber	NH_3	Not specified	1.0 g/m^3
Ammonia Plant Primary Reformer	NO_x	1-hour	144 mg/m^3
Ammonia Plant Auxiliary Boiler	NO_x	1-hour	144 mg/m^3
2008 Ammonium Nitrate Prilling Plant	Total Particulates	1-hour	0.05 g/m^3

Notes
1. At dry standard temperature and pressure (i.e. 0ºC and 101.3 kPa, dry).

The licence conditions also specify that the two existing Nitric Acid Plants cannot be started up at the same time. CSBP is required to maintain a minimum of one hour between the start-up of each Plant.

While the Superphosphate Plant Scrubber and Granulation Plant Deduster stacks are not subject to TSP or NH_3 licence emission conditions, they have also been included in the modelling assessment as non-trivial sources of emissions including PM and NH_3.

4 Ambient Air Quality

Background ambient concentration data were available for two of the pollutants of interest in this study:

- NO_2; and
- NH_3.

The DEC has conduct ambient air quality monitoring of nitrogen oxide (NO) and NO_2 concentrations within the Kwinana region. Monitoring has been conducted at the Hope Valley (until April 2008 when this station was decommissioned) and North Rockingham stations, both located within approximately 5 km of the CSBP facility (Figure 1). The NO_2 concentrations are collected by the DEC in compliance with the NEPM (NEPC, 2003) and are made available in the annual DEC air monitoring reports.

As noted in the 2008 Western Australian Annual Air Monitoring Report (DEC, 2009a) the NEPM NO_2 1-hour standard of 0.12 ppm has not been exceeded at either the Hope Valley or North Rockingham monitoring stations over the last ten years (1999 to 2008). The highest maximum 1-hour NO_2 concentration monitored at Hope Valley between these years was 0.084 ppm (recorded in 2007). The highest maximum 1-hour NO_2 concentration monitored at North Rockingham during the same period was 0.055 ppm (recorded in 2004).

To assess the cumulative impacts of the current proposal on ambient NO_2 concentrations at each site, the maximum 1-hour and annual averaged NO_2 concentrations monitored between 1999 and 2008 have been used, as detailed in Table 3.

Table 3: Summary of Ambient NO_2 Concentrations Measured in Kwinana

Monitoring Station	Hope Valley			North Rockingham		
	ppm	µg/m³	% NEPM[1]	ppm	µg/m³	% NEPM[1]
1-hour Average						
Max. between 1999 and 2008	0.084[2]	173	70%	0.055[3]	113	46%
Annual Average						
2008	0.009	18	30%	0.013	27	43%

Notes
1. 1 hour NO_2 NEPM = 0.12 ppm; Annual NO_2 NEPM = 0.03 ppm.
2. As recorded in 2007.
3. As recorded in 2004.

The DEC conducted the Background Air Quality (Air Toxics) Study that involved monitoring of ambient concentrations of various air toxics in the Perth metropolitan area (including Kwinana). The results of the study are posted on the DEC website:

(http://portal.environment.wa.gov.au/portal/page?_pageid=54,3168889&_dad=portal&_schema=PORTAL).

Passive samplers were used to collect six day samples of NH_3 at Wells Park between May 2005 and July 2006. The average concentration of NH_3 collected over the duration of the study was found to be 17 µg/m^3, and is considered to be the best information available to determine the annual average background NH_3 concentration.

Due to the limitations of the passive samplers used in the Background Air Quality (Air Toxics) Study to measure NH_3 concentrations, shorter term average NH_3 background concentrations were not available for analysis within this study.

The 2008 Western Australia Air Monitoring Report (DEC 2009a) contains ambient air concentrations of PM_{10} and $PM_{2.5}$ throughout the Perth metropolitan region. The South Lake station is the closest site to Kwinana, however the site is between fifteen and twenty kilometres away and would not be representative of the PM_{10} and $PM_{2.5}$ concentrations in the model domain. Therefore, no PM_{10} or $PM_{2.5}$ background data were used in the analysis.

5 Modelling Methodology

5.1 Air Dispersion Models

The Gaussian dispersion models Dispmod (Version 2005) and the Industrial Source Complex 3 (ISC3) (Version 5.1.0) were both used in this study to predict the air quality impacts for the baseline emissions scenario. Dispmod was developed by the DEC and includes the effects of coastal fumigation on plume dispersion, and is therefore considered to be an appropriate model to predict dispersion characteristics of emissions on the Western Australian coastline. ISC3 was developed by the United States Environmental Protection Agency (USEPA) and includes enhanced treatment of the effects of buildings on plume dispersion. ISC3 has since been replaced by AERMOD as the USEPA's preferred model for most small scale regulatory applications, however it is still used extensively for regulatory assessments of industrial sources within Australia, particularly when buildings or structures are expected to impact the plume dispersion.

These two models have been chosen in order to ensure the modelling results account for coastal dispersion influences and building wake effects. The Dispmod air dispersion model has very limited capacity for considering the influence of building wake effects on plume dispersion, while the ISC3 model can account for building wakes but does not include an algorithm for coastal fumigation. As a general rule, building wake effects are likely to influence plume dispersion if the height of the exhaust stack is less than 2.5 times the height of the nearest building. As there are a number of buildings and structures within the vicinity of the modelled sources (refer to Figure 3), building wakes effects were considered a potential influence on plume dispersion.

Previous modelling carried out by ENVIRON (2009) for CSBP indicated that the worst case predicted impacts varied depending on source characteristics (i.e. stack height) and that no one model generated the most conservative results. As such, this assessment has also utilised both the Dispmod and ISC3 air dispersion models in order to predict NH_3, PM (as $PM_{2.5}$) and NO_2 GLCs.

5.2 Meteorological Data

Meteorological data collected by the DEC, at Hope Valley during the 1996 and 1997 calendar years were used for Dispmod and ISC3 modelling respectively. The Dispmod and ISC3 models have different meteorological data requirements and as data for a single year are not available in both of the required formats, meteorological data files for successive years were selected for this assessment. The 1996 and 1997 data files were also used by ENVIRON in past assessments for CSBP (e.g. ENVIRON, 2008).

Hope Valley is located approximately 4 km north northeast of the CSBP site (Figure 1) and is considered to be generally representative of the meteorology of the area. In addition, the meteorological data sets were chosen for consistency as these data sets have been used for several previous air quality assessments for CSBP and other Kwinana industries.

Annual wind roses derived from the 1996 and 1997 datasets are presented in Figures 4. Each windrose illustrates the strong influence of south-southwesterly and easterly winds on the meteorological conditions throughout the year. Moderate to strong south-southwesterly winds of between 4.5 and 9 m/s are common, as are easterly winds of between 1.5 and 4.5 m/s.

5.3 Model Parameterisation

The Dispmod and ISC3 models were used to predict the dispersion of NO_2, PM (as $PM_{2.5}$) and NH_3 emissions for each source operating under normal conditions, as well as for the Nitric Acid Plants operating under start-up and shutdown conditions. Each scenario was conservatively modelled assuming constant and continuous emissions from each source throughout the modelled year. The maximum predicted GLCs outside of the CSBP site boundary were assessed against the relevant ambient air quality criteria.

GLCs were predicted over a model domain of 4.8 km by 6.8 km. Gridded receptors were spaced at 200 m intervals. Boundary receptors were also incorporated into the ISC3 model at 25 m spacings in order to differentiate between on-site and off-site impacts. As the Dispmod model does not enable this same function, the Dispmod results were post-processed in order to define the predicted on-site and off-site GLCs.

The terrain of the modelled domain is considered to be relatively flat for modelling purposes and is not expected to influence the predicted GLCs. As such, terrain data were not incorporated into the ISC3 model (the Dispmod model does not have the option to incorporate terrain effects).

Dispmod was run in both statistical and non-statistical modes with the standard input configurations as defined in the *Instructions for use of Dispmod and Post Processing Software*, previously supplied to ENVIRON by the DEC. The development of a probabilistic emissions profile for use in the statistical analysis is described further in Section 5.4.1. A sample of the Dispmod model inputs for both statistical and non-statistical modes is provided in Appendix A.

ISC3 was run using regulatory default parameters and with both the urban and rural wind profile exponents. While the area within 3 km of CSBP is primarily rural, there are also industrial regions immediately surrounding the site which could influence the dispersive characteristics of the atmosphere. Both the urban and rural wind profile exponents were run in order to determine the most conservative setting. A sample of the ISC3 input file is provided in Appendix B.

Building wake effects were incorporated into the ISC3 model using the Building Profile Input Program (BPIP) – Plume Rise Model Enhancements (PRIME) building algorithm. Building locations and dimensions were based on facility drawings as provided by CSBP as part of previous air quality assessments (ENVIRON, 2008). The coordinates and building heights and the resulting PRIME algorithm parameters are provided as part of the sample ISC3 input file in Appendix B.

The ISC3 outputs were also post-processed using the Dispmod tools developed by the DEC to calculate GLCs from emissions that are described probabilistically. This approach is described further in Section 5.4.1.

5.4 Emission Estimates and Stack Parameters

The sources and associated compounds considered in the modelling assessment are as follows:

Ammonium Nitrate Business:

- Nitric Acid Plants Stacks: NO_x, NH_3;
- 2008 Ammonium Nitrate Prilling Plant: NH_3, PM (as $PM_{2.5}$); and
- Proposed Auxiliary Boiler Stack: NO_x.

Other:

- Superphosphate Plant Scrubber Stack: PM (as $PM_{2.5}$);
- Granulation Plant Scrubber Stack: NH_3, PM (as $PM_{2.5}$);
- Granulation Plant De-duster Stack: NH_3, PM (as $PM_{2.5}$);
- Ammonia Plant Primary Reformer Stack: NO_x; and
- Existing Auxiliary Boiler Stack: NO_x.

The stack parameters, exhaust characteristics and emissions estimates associated with each of the above sources were based on data provided by CSBP (unless otherwise indicated). It has been assumed that the exhaust characteristics for Nitric Acid Plant 3 are the same as Nitric Acid Plant 2, based on the same design and operation.

Stack monitoring data were analysed by ENVIRON in order to determine the average volumetric flow rate for each source for use in the modelling. The maximum mass emission rates measured under normal operations for each of the modelled compounds were also selected from the monitoring data for each source. However, analysis of continuous emissions monitoring data for the Nitric Acid Plants indicates that the concentration of NO_x emissions varies under 'normal' operating conditions and is generally much lower than the maximum concentrations. A probabilistic approach was adopted to model NO_x emissions during 'normal' operation of the Nitric Acid Plants in order to account for this variation in the emissions. The probabilistic emissions profile used in this assessment is described further in Section 5.4.1.

Emissions of NH_3 from the Nitric Acid Plants however, were modelled using a non-probabilistic approach. The modelled NH_3 emission rate was conservatively based on the maximum NH_3 concentration of 4.8 ppm, as recorded for Nitric Acid Plant 2 during normal operations (excluding data associated with calibration events). As this concentration is only expected to occur for a small proportion (0.02%) of the time and NH_3 concentrations are typically much lower (i.e. less than 1 ppm), the modelled NH_3 emission rate is considered conservative.

For the Nitric Acid Plants operating under start-up conditions, the modelled NO_x emission rate was conservatively based on the emission concentration limit of 2,000 mg/m^3 (at STP, dry) as specified in CSBP's Environmental Licence (see Section 3.2). In the absence of site specific data, a moisture content of 0.3% was adopted in order to calculate the mass emission rate at stack conditions. This percentage is based on the typical moisture content of tail gas from Nitric Acid Plants operating in line with best available pollution control techniques (EFMA, 2000).

The exhaust characteristics for the new Auxiliary Boiler were based on a 50% increase in emissions as compared to the existing boiler stack (refer to Section 2.2.1) based on a 50% larger boiler. It is assumed the new Auxiliary Boiler stack will be constructed to the same specifications as the existing boiler stack.

The volumetric flow rate and mass emission rate for the debottlenecked Prilling Plant were assumed to increase by 25%, as compared to the emission estimates defined for the baseline emissions scenario (refer to Section 2.3.1).

Exhaust gas density, which is required in order to run the Dispmod model, was based on the reported exhaust gas temperature. As Dispmod is not able to process negative buoyancy, sources which have a calculated density greater than that of air at 40ºC (i.e. 1.13 kg/m^3), were assumed to have an exhaust gas density of 1.13 kg/m^3 in order to enable the model to run. Negative buoyancy sources included the Granulation Plant De-duster Stack, Nitric Acid Plant 2 (during start-up), Nitric Acid Plant 1, 2 and 3 (during shut-down), and the 2008 Ammonium Nitrate Prilling Plant.

In the absence of particle sizing information, all reported PM emissions have conservatively been assumed to be $PM_{2.5}$. Compliance of the maximum predicted 24-hour average PM (as $PM_{2.5}$) GLCs with the respective NEPM advisory reporting standard would also indicate compliance with the higher 24-hour average PM_{10} standard.

The stack monitoring data from which the modelled PM (as $PM_{2.5}$) emission rate for the De-duster Stack was based consists of four separate samples collected over a 3-year period. The maximum of the reported particulate emission rates of 1.16 g/s (ECS, 2008) is not considered to be representative of normal operations (*Pers comm*. Nick Burkett, CSBP. 17 June 2010), and as such for the purposes of this assessment, has been excluded from the dataset. The maximum reported particulate emission rate of the remaining three samples (which range from 0.2 g/s to 0.3 g/s) has been adopted for modelling purposes.

Summaries of the source parameters and non-statistical emission estimates used in the model for the baseline and expansion emissions scenarios are provided in Tables 4 and 5 respectively.

Table 4: Summary of Stack Parameters and Emission Estimates – Baseline Emissions Scenario

Source	Coordinates		Distance from Coast	Stack Height	Stack Diameter	Velocity[1]	Volumetric Flow rate[2]	Exhaust Density	Exhaust Temperature	Compound	Emission Rate[3]
	mE	mN	m	m	m	m/s	m^3/s	kg/m^3	K		g/s
Superphosphate Plant Scrubber	383,476	6,432,254	312	37.4	2.5	5.7	27.9	1.126	315	$PM_{2.5}$[4]	0.64
Granulation Plant Scrubber	383,615	6,432,437	430	43.1	1.8	7.1	18.7	1.074	330	NH_3	0.29
										$PM_{2.5}$[4]	0.18
Granulation Plant De-duster	383,620	6,432,451	430	36.8	1.6	12.2	24.0	1.157[5]	307	NH_3	0.24
										$PM_{2.5}$[4]	0.29
Nitric Acid Plant 1 (Normal)	383,624	6,432,497	460	63.8	1.1	31.4	29.8	0.932	378	NH_3	0.079[6]
										NO_x[7]	See Table 6
Nitric Acid Plant 1 (Shutdown)						32.1	30.5	1.191[5]	298	NO_x	70.37[8]
Nitric Acid Plant 2 (Normal)	383,626	6,432,564	456	70.7	1.1	37.8	35.9	0.932	378	NH_3	0.096[6]
										NO_x[7]	See Table 6
Nitric Acid Plant 2 (Start-up)[9]						22.3	21.2	1.159	306	NO_x	37.81[10]
Nitric Acid Plant 2 (Shutdown)						35.9	34.1	1.191[5]	298	NO_x	50.8[8]
Ammonia Plant Primary Reformer	383,811	6,432,690	640	30	2.1	13.7	48.9	0.774	458	NO_x	5.17
Ammonia Plant Auxiliary Boiler	383,812	6,432,704	640	30	1.2	5.7	6.5	0.802	443	NO_x	1.59
2008 Ammonium Nitrate Prilling Plant	383,913	6,432,587	728	65	1.7	16.6	38.5	1.171[5]	303	NH_3	0.04
										$PM_{2.5}$[4]	0.26

Notes
1. Based on average reported volumetric flow rate.
2. Average reported volumetric flow rate.
3. Maximum reported mass emission rate, except as noted.
4. In the absence of particulate sizing information, all reported PM was conservatively assumed to be $PM_{2.5}$.
5. An exhaust gas density of 1.13 kg/m^3 was selected for use in the Dispmod in order to avoid negative buoyancy and enable the model to run.
6. The mass emission rate has been conservatively based on the maximum reported half hour average emission concentration of 4.8 ppm. This concentration is only expected to occur for 0.02% of the time and NH_3 concentrations are typically less than 1 ppm.
7. A probabilistic emissions profile was applied to NO_x emissions from the Nitric Acid Plants operating under normal conditions. The probabilistic emissions profile is presented in Table 6.
8. The mass emission rate has been based on the maximum concentration, as contained in the emission monitoring data for Nitric Acid Plant shut-downs provide by CSBP.
9. As start-up of the Nitric Acid Plants is restricted to one plant at a time, the baseline start-up scenario was modelled assuming Nitric Acid Plant 1 was operating under normal conditions while Nitric Acid Plant 2 was starting up (refer to Section 5.4.2).
10. The mass emission rate has been conservatively based on the half hour average emission limit of 2,000 mg/m^3 (at 0^oC and 101.3 kPa, dry) and a moisture content of 0.3%.

Table 5: Summary of Stack Parameters and Emission Estimates – Expansion Emissions Scenario

Source	Coordinates		Distance from Coast	Stack Height	Stack Diameter	Velocity[1]	Volumetric Flow rate[2]	Exhaust Density	Exhaust Temperature	Compound	Emission Rate[3]
	mE	mN	m	m	m	m/s	m^3/s	kg/m^3	K		g/s
Superphosphate Plant Scrubber	383,476	6,432,254	312	37.4	2.5	5.7	27.9	1.126	315	$PM_{2.5}$[4]	0.64
Granulation Plant Scrubber	383,615	6,432,437	430	43.1	1.8	7.1	18.7	1.074	330	NH_3	0.29
										$PM_{2.5}$[4]	0.18
Granulation Plant De-duster	383,620	6,432,451	430	36.8	1.6	12.2	24.0	1.157[5]	307	NH_3	0.24
										$PM_{2.5}$[4]	0.29
Nitric Acid Plant 1 (Normal)	383,624	6,432,497	460	63.8	1.1	41.6	39.5	0.932	378	NH_3	0.11[6]
										NO_x[7]	See Table 6
Nitric Acid Plant 1 (Shutdown)						41.6	39.5	1.191[5]	298	NO_x	91.2[8]
Nitric Acid Plant 2 (Normal)	383,626	6,432,564	456	70.7	1.1	41.6	39.5	0.932	378	NH_3	0.11[6]
										NO_x[7]	See Table 6
Nitric Acid Plant 2 (Start-up)[9]						22.3	21.2	1.159[5]	306	NO_x	37.81[10]
Nitric Acid Plant 2 (Shutdown)						41.6	39.5	1.191[5]	298	NO_x	58.0[8]
Nitric Acid Plant 3 (Normal)	383,633	6,432,672	465	70.7	1.1	41.6	39.5	0.932	378	NH_3	0.11[6]
										NO_x[7]	See Table 6
Nitric Acid Plant 3 (Shutdown)						41.6	39.5	1.191[5]	298	NO_x	58.0[8]
Ammonia Plant Primary Reformer	383,811	6,432,690	640	30	2.1	13.7	48.9	0.774	458	NO_x	5.17
Ammonia Plant Auxiliary Boiler	383,812	6,432,704	640	30	1.2	5.7	6.5	0.802	443	NO_x	1.59
New Ammonia Plant Auxiliary Boiler	383,824	6,432,697	655	30	1.2	8.5	9.7	0.802	443	NO_x	2.39
2008 Ammonium Nitrate Prilling Plant (Debottlenecked)	383,913	6,432,587	728	65	1.7	20.7	48.1	1.171[5]	303	NH_3	0.04
										$PM_{2.5}$[4]	0.33

Notes
1. Based on average reported volumetric flow rate.
2. Average reported volumetric flow rate.
3. Maximum reported mass emission rate, except as noted.
4. In the absence of particulate sizing information, all reported PM was conservatively assumed to be $PM_{2.5}$.
5. An exhaust gas density of 1.13 kg/m^3 was selected for use in the Dispmod in order to avoid negative buoyancy and enable the model to run.
6. The mass emission rate has been conservatively based on the maximum reported half hour average emission concentration of 4.8 ppm. This concentration is only expected to occur for 0.02% of the time and NH_3 concentrations are typically less than 1 ppm.
7. A probabilistic emissions profile was applied to NO_x emissions from the Nitric Acid Plants operating under normal conditions. The probabilistic emissions profile is presented in Table 6.
8. The mass emission rate has been based on the maximum concentration, as contained in the emission monitoring data for Nitric Acid plant shut-downs provide by CSBP.
9. As start-up of the Nitric Acid Plants is restricted to one plant at a time, the baseline start-up scenario was modelled assuming Nitric Acid Plants 1 and 3 were operating under normal conditions while Nitric Acid Plant 2 was starting up (refer to Section 5.4.2).
10. The mass emission rate has conservatively been based on the half hour average emission limit of 2,000 mg/m^3 (at 0^oC and 101.3 kPa, dry) and a moisture content of 0.3%.

5.4.1 Identification and Treatment of Probabilistic Emissions

Analysis of the continuous emissions monitoring data provided by CSBP for the Nitric Acid Plants indicates that during 'normal' operations, the one hour average NO_x concentrations remain between 100 mg/m^3 (STP, dry) and 150 mg/m^3 (STP, dry) for the vast majority (>98%) of the time. However, peaks in the one hour average NO_x concentrations of up to 370 mg/m^3 (STP, dry) have occurred which is comparable to the licence limit of 410 mg/m^3 and are generally associated with a time period of a few hours following a start-up event. CSBP understands that these excursions are primarily related to the transition from manual to automatic operation of the Nitric Acid Plant NO_x emission control system following start-up of the plant(s).

In order to account for the short-term peak NO_x concentrations that occur during 'normal' operation of the Nitric Acid Plants, while also taking into consideration that NO_x concentrations remain much lower for the large majority of the time, a probabilistic approach was adopted to model the NO_x emissions from these sources.

A series of post-processing tools were developed by the DEC to determine the predicted GLCs associated with different frequencies of emissions from modelled sources as used for the Kwinana EPP sulphur dioxide redetermination (DEC, 2009b). In essence, these tools compute exceedance frequencies of a range of concentrations for a combination of emissions and multiply these exceedance frequencies by the probability that the emissions combination will occur, before summing the probability-weighted exceedance frequencies to give a final result.

Following the definition of emission profiles and the probability of occurrence associated with each case, the following modelling procedures are followed to determine the probability-weighted GLCs:

- The air dispersion model is run once with all emission sources using a representative emission rate (based on the emissions identified for each case). Fixed emissions sources (i.e. those sources for which emissions are not expected to vary significantly) are also included in the model run using their actual emission rates. The predicted concentrations for each variable emission source and for the fixed emission sources are saved to a file for each hour of the year and for each grid point such that they can be used by the post-processor.
- The potential combinations of the emissions cases across each source are reviewed to select the non-negligible "emissions scenarios" that need to be considered. This selection is done by computing the joint probability of every possible combination of emissions cases across all sources, screening out those combinations which fail an emissions-weighted probability threshold test and then re-assigning the screened fragments of probability such that the set of retained scenarios have probabilities which total 1.0. The emissions-weighted threshold is determined for each scenario by multiplying a user-specified constant threshold probability (e.g. 0.0001) by a factor which is the sum of all emissions represented by the scenario divided by the sum of all emissions when all industries are operating in "normal" (highest probability) mode. This weighting attaches importance to large emissions which might occur infrequently.

- For each non-negligible emissions scenario that is selected, the post-processor reads the ambient concentrations predicted by the air dispersion model, scales these concentrations by the ratio of the actual emission rates to those used in the model. The predicted concentrations resulting from each emission source are then accumulated and combined with the concentrations resulting from the constant emission sources, to determine the total ground-level concentration for each model grid point for each time-step. The post-processor checks for exceedances of each of 20 “reference levels” which span the expected range of ground-level concentrations (e.g. 20 points over the range 0 to 200 µg/m^3) and updates the running totals for each grid-point with the probability that the combination of emissions can occur and then proceeds to the next time-step.
- Once the post-processing of a scenario is complete the accumulated number of hours above each of the 20 reference levels are multiplied by the scenario’s probability of occurrence to calculate the total expected number of hours of exceedance for each reference level, at each grid point, for that scenario.
- All scenarios are processed sequentially and the probability-weighted exceedance counts for each reference level, across all scenarios, are summed at each grid-point. These resultant total exceedance counts include non-integer values which are interpreted as the average number of exceedances of a reference level per year (e.g. an exceedance count of 0.25 is interpreted to mean "once in four years").
- The output from the post-processor is a file that contains the count of exceedances for each grid point and for each reference level. This output file is used to extract exceedance counts of particular reference levels for contouring or calculation of cumulative frequencies. A single grid of 99.9 percentile concentrations is also computed by log linear interpolation between the exceedance grids to find, for each grid-point, the concentration at which the annual exceedance count is 8.77 (the 99.9 percentile level). The contour map produced from this grid is used to assess compliance with standards.

This approach has also been adopted in the recent redetermination of the maximum permissible quantities for sulphur dioxide at Kwinana (DEC, 2009b).

A summary of the probabilistic emissions profiles defined for the Nitric Acid Plants under the baseline and expansion emissions scenarios is presented in Table 6. Note start-up and shutdown operations have been excluded from the probabilistic approach and the predicted GLCs associated with these events have been determined separately as they are not totally independent events for each plant.

Table 6: Summary of Probabilistic Emissions Profile - Nitric Acid Plants, Normal Operations

Source	Volumetric Flowrate[1]	Exhaust Temp.	NO_x Concentration		NO_x Emission Rate	Probability
	m^3/s	K	mg/m^3, STP	mg/m^{3}[2]	g/s	%
Baseline Emissions Scenario						
Nitric Acid Plant 1	29.8	378	120	86	2.6	96%
			150	108	3.2	2%
			410[3]	295	8.8	2%
Nitric Acid Plant 2	35.9	378	120	86	3.1	96%
			150	108	3.9	2%
			410[3]	295	10.6	2%
Expansion Emissions Scenario						
Nitric Acid Plant 1	39.5	378	120	86	3.4	96%
			150	108	4.3	2%
			410[3]	295	11.7	2%
Nitric Acid Plant 2	39.5	378	120	86	3.4	96%
			150	108	4.3	2%
			410[3]	295	11.7	2%
Nitric Acid Plant 3	39.5	378	120	86	3.4	96%
			150	108	4.3	2%
			410[3]	295	11.7	2%

Notes
1. At stack conditions
2. Assumes a moisture content of 0.3%.
3. Hourly average NO_x emission concentration limit (excluding start-ups), as specified in CSBP's Environmental Licence.

5.4.2 Modelled Scenarios

Air quality impacts have been assessed for the baseline and expansion emissions scenarios operating under the following conditions:

- Normal Operations;
- Nitric Acid Plant Start-up; and
- Nitric Acid Plant Shutdown.

Under normal operations, each source was modelled assuming constant and continuous emissions throughout the modelled year, with the exception of NO_x emissions from the Nitric Acid Plants. A probabilistic emissions profile was developed for the Nitric Acid Plants to account for variations in the concentration of NO_x emissions during 'normal' operations (refer to Section 5.4.1).

As start-up of the Nitric Acid Plants is restricted to one plant at a time, the baseline start-up scenario was modelled assuming Nitric Acid Plant 1 was operating under normal conditions while Nitric Acid Plant 2 was starting up, and all other sources of NO_x emissions (i.e. the Ammonia Plant Primary Reformer and Auxiliary Boiler stacks) were operating under normal conditions. Under the expansion start-up scenario, Nitric Acid Plants 1 and 3 were assumed to be operating under normal conditions while Nitric Acid Plant 2 was starting up and all other sources of NO_x emissions were operating under normal conditions.

The assessment has also taken into account that the duration of a Nitric Acid Plant start-up is typically less than 30-minutes by modelling the cumulative impacts of the Nitric Acid Plant 2 operating under start-up conditions for 30-minutes and under normal conditions for the remaining 30-minutes, for each modelled hour. The Nitric Acid Plant 2 under start-up and under normal conditions was treated as two separate sources in the model and the average of the maximum 1-hour NO_x concentrations predicted for both 'sources' was determined by adjusting the respective NO_x emission rates by half.

Under certain upset conditions, such as loss of power to the site, it is possible that each Nitric Acid Plant would need to be shut down at the same time. As such, the 'shutdown' scenario was conservatively modelled assuming all Nitric Acid Plants would be shutdown simultaneously while all other sources of NO_x emissions (i.e. the Ammonia Plant Primary Reformer and Auxiliary Boiler stacks) were modelled under normal conditions. Similar to the treatment of Nitric Acid Plant start-ups, the assessment has taken into account that the duration of a Nitric Acid Plant shutdown is typically less than 10-minutes by modelling the cumulative impacts of each of the Nitric Acid Plants operating under shutdown conditions for 10-minutes and assuming no further NO_x emissions for the remaining 50-minutes (as the plants are in shut down mode), for each modelled hour.

While it is anticipated that the existing Auxiliary Boiler will operate for no more than 5% of the time (i.e. in the event of multiple plant start-ups), the maximum 1-hour NO_x GLCs have been predicted for normal, start-up and shutdown operations under the expansion scenario conservatively assuming that both the existing and proposed Auxiliary Boilers are operating simultaneously. The annual average NO_x GLCs have been predicted for normal operations under the expansion scenario assuming the existing Auxiliary Boiler was not in operation.

5.5 Treatment of Oxides of Nitrogen Concentrations

A key element in assessing the potential environmental impacts from ground level NO_2 concentrations is estimating the NO_2 concentrations from modelled NO_x emissions. The final NO_2 concentration is a combination of the NO_x emitted as NO_2 from the source stacks and the amount of NO_x that is converted to NO_2 by oxidation in the plume after release.

Generally, after NO_x is emitted from the stack, additional NO_2 is formed as the plume mixes and reacts with the surrounding air. There are several reactions that both form and destroy NO_2, but the primary reaction is oxidation with ozone according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2 \qquad \textit{Equation 1}$$

This reaction is essentially instantaneous as the plume entrains the surrounding air. It is limited by the amount of ozone available and by how quickly the plume mixes with the surrounding air. Thus, the ratio of NO_2 to NO_x increases as the plume disperses downwind.

In the absence of modelling including photochemistry directly, there are four common methods used to estimate the final ratio of NO_2 to NO_x. These are:

- Total Conversion: This method conservatively assumes all NO_x is converted to NO_2.
- United States Environmental Protection Agency (USEPA) Tier 2 Assumption: This method assumes a national default ratio of NO_2 to NO_x of 0.75.
- Ozone Limiting Method (OLM): This method commonly assumes 10% of the stack NO_x emissions are NO_2 and that ozone is the limiting reagent for Equation 1 (i.e. the ozone concentration is less than the remaining NO_x concentration). The estimated NO_2 concentration can be calculated using Equation 2 (the equation can vary depending on the NO_2 content of the stack emissions and whether ozone or NO_x is the limiting reagent):

$$NO_2 = (0.1 \times NO_x) + O_3 \qquad \textit{Equation 2}$$

Where:

NO_2 = estimated ground level concentration of nitrogen dioxide (ppm)

NO_x = predicted ground level concentration of oxides of nitrogen (ppm)

O_3 = measured background concentration of ozone (ppm)

The actual NO_2 in the stack emissions can be used should these data be available.

- Ambient Ratio Method (ARM): This method typically relies on at least a years worth of ambient monitoring data and assumes the final plume NO_2 to NO_x ratio will be equal to the existing ambient NO_2 to NO_x ratio. An equation developed by Dames and Moore (1993) based on monitoring data from Kwinana determined a NO_2 to NO_x ratio of 0.59 to 0.43 as follows:

$$[NO_2] = 0.59 \times [NO_x] - 0.00038 \times [NO_x]^2 \qquad \textit{Equation 3}$$

The suitability of each of these methods with regards to predicting NO_2 GLCs associated with emissions from CSBP was investigated by ENVIRON as part of a previous air quality assessment (ENVIRON, 2008). The Total Conversion and USEPA Tier 2 Assumption were considered overly conservative and did not allow for locally available data to be taken into account. The OLM was also considered likely to overestimate NO_2 concentrations as it would rely on very conservative estimates of background ozone concentrations (one hour maximum for the region).

The ARM method and the equation developed by Dames and Moore (1993) was considered the most appropriate method while still remaining conservative enough that actual NO_2 concentrations are likely less than those predicted by the modelling. This method was also selected for the purpose of this report as it is consistent with previous air quality studies carried out by ENVIRON for CSBP (i.e. ENVIRON, 2008) and other analyses conducted in the Kwinana region.

5.6 Ammonium Nitrate Deposition Over Cockburn Sound

Particulate emissions from the 2008 Ammonium Nitrate Prilling Plant are largely composed of ammonium nitrate particles. The Public Environmental Review (PER) completed for the previous Ammonium Nitrate Production Expansion Project (CSBP, 2005) looked at ammonium nitrate particle deposition over Cockburn Sound as a contributing factor to the total load of nitrogen entering the Sound. The assessment included emissions from Prilling Plant 1 (now decommissioned), and concluded that the nutrient addition from particulate ammonium nitrate were not significant when compared to the total load of nitrogen entering Cockburn Sound.

Since the 2005 PER was conducted, the estimated particulate emission load from the 2008 Ammonium Nitrate Prilling Plant has been revised from 2.8 g/s (derived originally from equipment design specifications), down to 0.26 g/s (derived from the results of stack testing during actual plant operations). The concentration of particulate emissions from the 2008 Ammonium Nitrate Prilling Plant will not be impacted as a result of the expansion project (refer to Section 2.3.1), however the particulate emission load is expected to increase by up to 25% (to 0.33 g/s), as a result of the increased volumetric flow rate of emissions arising from the debottlenecking (refer to Tables 4 and 5).

The particulate load from the 2008 Ammonium Nitrate Prilling Plant for the expansion project is estimated to be an order of magnitude lower than was used for the previous assessment of ammonium nitrate deposition over Cockburn Sound. As such, based on the findings from the previous assessment of ammonium nitrate deposition over Cockburn Sound conducted for the 2005 PER, emissions from the debottlenecked 2008 Ammonium Nitrate Prilling Plant are expected to remain a relatively minor contributor to the total load of nitrogen entering Cockburn Sound.

6 Modelling Results

6.1 Normal Operations

A summary of the maximum off-site NH_3, PM (as $PM_{2.5}$) and NO_x concentrations predicted by both the Dispmod and ISC3 dispersion models for the baseline and expansion emissions scenarios, under normal operating conditions is presented in Table 7. NO_2 concentrations have been calculated from the predicted NO_x concentrations using the Dames and Moore (1993) equation (refer to Section 5.5).

The concentrations predicted for CSBP operating under normal conditions in isolation have been compared to the relevant ambient air quality criteria and are expressed as percentages of the guideline values. The concentrations highlighted in bold represent the highest off-site GLC predicted by the alternative models and model options applied. Contours of the maximum short-term (1-hour or 24-hour average) and long-term (annual average) NH_3, PM (as $PM_{2.5}$) and NO_2 GLCs predicted by the most conservative model and configuration are presented as Figures 5 through 10.

Table 7: Summary of Maximum Predicted Off-site GLCs (µg/m^3) – Normal Operations

Compound	Averaging Period	Baseline Emissions Scenario			Expansion Emissions Scenario		
		Dispmod	ISC3		Dispmod	ISC3	
			Rural	Urban		Rural	Urban
NH_3	1-hour	11	**25**	24	11	**25**	24
	Guideline[1]	330	330	330	330	330	330
	% Guideline	3.3%	**7.6%**	7.3%	3.3%	**7.6%**	7.3%
	Annual	0.3	1.0	**1.1**	0.3	1.0	**1.1**
	Guideline[2]	180	180	180	180	180	180
	% Guideline	0.1%	0.5%	**0.6%**	0.1%	0.5%	**0.6%**
PM (as $PM_{2.5}$)	24-hour	3.8	**13.5**	13	3.8	**13.5**	13
	Guideline[3]	25	25	25	25	**25**	25
	% Guideline	15%	**54%**	52%	15%	**54%**	52%
	Annual	0.5	**2.1**	2.1	0.5	**2.1**	2.1
	Guideline[3]	8	8	8	8	**8**	8
	% Guideline	6.5%	**27%**	26%	6.5%	**27%**	26%
NO_x	1-hour	50	55	**100**	55	95	**155**
	Annual	0.7	2.0	**3.4**	1.4	3.7	**5.1**
NO_2	1-hour	29	31	**55**	31	53	**82**
	Guideline[3]	246	246	246	246	246	246
	% Guideline	12%	13%	**22%**	13%	21%	**34%**
	Annual	0.4	1.2	**2.0**	0.8	2.2	**3.0**
	Guideline[3]	62	62	62	62	62	62
	% Guideline	0.7%	1.9%	**3.2%**	1.4%	3.6%	**4.9%**

Notes
1. Source: Vic EPA (2001).
2. Source: UKEA (2009).
3. Source: NEPC (2003).

The data presented in Table 7 indicates that the expansion project is likely to result in an increase in the maximum off-site 1-hour and annual average NO_2 GLCs predicted for normal operations. However, the maximum off-site 1-hour and annual average NH_3 GLCs predicted for normal operations are expected to remain unchanged, as are the maximum off-site 24-hour and annual average PM (as $PM_{2.5}$) GLCs. All of the predicted GLCs comply with the relevant ambient air quality criteria, for both the baseline and expansion scenarios when CSBP's operations are considered in isolation.

The ISC3 model consistently predicts higher GLCs than the Dispmod model. The higher GLCs associated with ISC3 are likely to be a result of the building wake effects on the predicted plume dispersion. Within ISC3, the rural setting tends to predict higher short-term maximum concentrations, while the urban setting predicts higher long-term concentrations.

The maximum off-site 1-hour average NH_3 GLC predicted for both the baseline and expansion emissions scenarios for CSBP in isolation is 25 µg/m^3 (ISC3 rural setting). This concentration comfortably complies with the UKEA's 1-hour average NH_3 EAL of 2,500 µg/m^3 and the Vic SEPP equivalent design criteria of 330 µg/m^3. The maximum off-site annual average NH_3 GLC predicted for both the baseline and expansion scenarios is 1.1 µg/m^3 (ISC3 urban setting). This concentration also complies comfortably with the annual average NH_3 UKEA EAL of 180 µg/m^3.

Contours of the maximum 1-hour average NH_3 GLCs predicted for the baseline and expansion emission scenarios for CSBP's operations in isolation, as presented in Figure 5, illustrate that peak off-site impacts are predicted to occur immediately to the west of the CSBP site boundary. Contours of the annual average NH_3 GLCs also indicate peak off-site impacts are predicted to occur immediately to the west of the CSBP site boundary (Figure 6).

Analysis of the model results indicates that emissions from the Granulation Plant Scrubber Stack and De-duster Stack primarily drive the maximum predicted off-site NH_3 concentrations from CSBP's emission sources. As the Granulation Plant does not form part of the expansion project, the emissions and consequent GLCs arising from these sources remains the same as for existing operations. The combined emissions from the Nitric Acid Plants and Prilling Plant contribute less than 8% to the maximum predicted 1-hour or annual average NH_3 GLC under both the baseline and expansion scenarios. As such, the upgrade of the Nitric Acid Plants and Prilling Plant and the associated increase in NH_3 emissions from these sources under the expansion project do not significantly impact on the maximum off-site NH_3 GLCs predicted for CSBP's operations in isolation.

Emissions from the Prilling Plant contribute less than 6% to the maximum predicted 24-hour and annual average PM (as $PM_{2.5}$) GLCs under both the baseline and expansion scenarios. As such, the increase in PM emissions from this source under the expansion project has a minimum effect on the maximum predicted off-site PM GLCs. Analysis of the predicted PM (as $PM_{2.5}$) GLCs indicates that emissions from the Granulation Plant De-duster Stack contribute less than 36% to the maximum predicted 24-hour and annual average PM (as $PM_{2.5}$) GLCs for CSBP in isolation.

The maximum off-site 24-hour average PM (as $PM_{2.5}$) GLC predicted for both the baseline and expansion emissions scenarios for CSBP's operations in isolation is 13.5 µg/m^3 (ISC3 rural setting). This concentration complies with the 24-hour average advisory reporting standard for $PM_{2.5}$ of 25 µg/m^3. As all of the particulate emissions were assumed to be $PM_{2.5}$, compliance with the $PM_{2.5}$ standard also demonstrates compliance with the 24-hour average PM_{10} NEPM of 50 µg/m^3. The maximum off-site annual average PM (as $PM_{2.5}$) GLC predicted for both the baseline and expansion scenarios for CSBP's operations in isolation is 2.1 µg/m^3 (ISC3 rural setting). This concentration also complies with the annual average $PM_{2.5}$ advisory reporting standard of 8 µg/m^3.

Contours of the maximum predicted 24-hour average PM (as $PM_{2.5}$) GLCs predicted for both the baseline and expansion emission scenarios for CSBP's operations in isolation are presented in Figure 7 and indicate that peak off-site impacts are likely to occur to the west of the site boundary. Contours of the annual average PM (as $PM_{2.5}$) GLCs also indicate peak off-site impacts are predicted to occur immediately to the west of the CSBP site boundary (Figure 8).

The maximum off-site 1-hour average NO_2 GLC predicted under the expansion scenario for CSBP in isolation is 82 µg/m^3 (ISC3 urban setting). This concentration is 50% higher than the maximum 1-hour average NO_2 GLC predicted for the baseline scenario, but is well below the 1-hour average NEPM for NO_2 of 246 µg/m^3. The maximum off-site annual average NO_2 GLC predicted under the expansion scenario for CSBP in isolation is 3.0 µg/m^3 (ISC3 urban setting). This concentration is also 50% higher than the maximum off-site annual average NO_2 GLC predicted for the baseline scenario, but is well below the annual average NO_2 NEPM of 62 µg/m^3.

Contours of the maximum 1-hour average NO_2 GLCs predicted for the baseline and expansion emission scenarios for CSBP's operations in isolation are presented in Figure 9. Peak concentrations are predicted to occur across the model domain in each scenario (Figure 9). The annual average NO_2 GLCs predicted for the baseline and expansion emission scenarios indicate that the highest long-term NO_2 GLCs are predicted to occur immediately to the north of the CSBP site boundary (Figure 10).

6.1.1 Cumulative Impacts

A summary of the cumulative impacts of normal operations under the baseline and expansion emissions scenarios on ambient air quality at the available monitoring locations is presented in Table 8. Ambient NH_3 concentrations monitored at the Wells Park site and ambient NO_2 GLCs monitored at the Hope Valley and North Rockingham sites have been used in this assessment (refer to Section 4).

As the monitored GLCs effectively take into account the regional impact of emissions from CSBP's existing operations (i.e. the baseline emissions scenario), the cumulative impact of CSBP's proposed expansion project on ambient concentrations at each site has been determined by adding the maximum incremental change in predicted GLCs associated with the expansion project at each of the monitoring sites to the monitored GLCs at each site. It should be noted that this assessment is extremely conservative for the short term (i.e. 1-hour) averaging times as the maximum predicted incremental change in GLCs associated with the proposed expansion project at each of the monitoring sites has been added to the maximum ambient concentrations recorded at the monitoring sites, which is not expected to occur in reality.

The cumulative GLCs have been expressed as a percentage of the corresponding ambient air quality criteria. The concentrations highlighted in bold represent the greatest incremental change in GLCs predicted by the alternative models and model options applied. The measured ambient GLCs have also been expressed as a percentage of the corresponding ambient air quality criteria, to enable comparison of the relative increase in cumulative air quality impacts predicted to occur as a result of the expansion project, within the context of compliance with the relevant ambient air quality criteria.

Table 8: Summary of the Cumulative Maximum Predicted GLCs for the Expansion Emissions Scenario

Compound	Averaging Period	Reference Parameter	Maximum GLC (µg/m3)		
			Dispmod	ISC3	
				Rural	Urban
Hope Valley					
NO_2	1-hour	Maximum Incremental Change[1]	4.1	8.8	**11.6**
		Ambient GLC[2]	173	173	173
		Cumulative GLC[3]	177	182	**185**
		Guideline[4]	246	246	246
		% Guideline Ambient GLC	70%	70%	70%
		% Guideline Cumulative GLC	72%	74%	**75%**

Table 8: Summary of the Cumulative Maximum Predicted GLCs for the Expansion Emissions Scenario

Compound	Averaging Period	Reference Parameter	Maximum GLC (µg/m3)		
			Dispmod	ISC3 Rural	ISC3 Urban
NO_2	Annual	Maximum Incremental Change[1]	0.06	**0.11**	0.05
		Ambient GLC[2]	18	18	18
		Cumulative GLC[3]	18.1	**18.1**	18.1
		Guideline[4]	62	62	62
		% Guideline Ambient GLC	29.0%	29.0%	29.0%
		% Guideline Cumulative GLC	29.1%	**29.2%**	29.1%
North Rockingham					
NO_2	1-hour	Maximum Incremental Change[1]	4.3	9.3	**16**
		Ambient GLC[2]	113	113	113
		Cumulative GLC[3]	117	122	**129**
		Guideline[4]	246	246	246
		% Guideline Ambient GLC	46%	46%	46%
		% Guideline Cumulative GLC	48%	50%	**52%**
	Annual	Maximum Incremental Change[1]	0.02	0.12	**0.13**
		Ambient GLC[2]	27	27	27
		Cumulative GLC[3]	27.0	27.1	**27.1**
		Guideline[4]	62	62	62
		% Guideline Ambient GLC	43.5%	43.5%	43.5%
		% Guideline Cumulative GLC	43.6%	43.7%	**43.8%**

Table 8: Summary of the Cumulative Maximum Predicted GLCs for the Expansion Emissions Scenario

Compound	Averaging Period	Reference Parameter	Maximum GLC (µg/m3)		
			Dispmod	ISC3	
				Rural	Urban
Wells Park					
		Maximum Incremental Change[1]	0.004	**0.004**	0.01
		Ambient GLC[2]	17	17	17
		Cumulative GLC[3]	17	**17**	17
		Guideline[5]	180	180	180
		% Guideline	9.4%	**9.4%**	9.4%

Notes

1. Maximum incremental change in predicted GLCs associated with the expansion project.
2. Ambient GLC as monitored by the DEC.
3. The cumulative GLCs have been calculated by adding the maximum predicted incremental change in GLCs associated with the expansion project to the monitored GLCs at each site.
4. Source: NEPC (2003).
5. Source: UKEA (2009).

The data presented in Table 8 indicates that CSBP's expansion project may result in an increase in the short-term ambient NO_2 GLCs at the Hope Valley and North Rockingham monitoring stations, while long-term ambient NO_2 GLCs at these sites are expected to increase only marginally.

The maximum 1-hour average NO_2 GLC monitored at the Hope Valley site is 173 µg/m^3. Under the expansion project the cumulative 1-hour average NO_2 GLC is predicted to increase by approximately 7% to 185 µg/m^3 (ISC3 urban setting). This concentration remains below the 1-hour average NO_2 NEPM of 246 µg/m^3 and is primarily driven by the maximum 1-hour NO_2 GLC measured at Hope Valley. Furthermore, it is considered highly conservative as it assumes that the monitored and predicted maximum concentrations occur at the same time.

The highest annual average NO_2 GLC monitored at the Hope Valley site is 18 µg/m^3. Under the expansion project the cumulative annual average NO_2 GLC is predicted to increase by 0.6% to 18.1 µg/m^3 (ISC3 rural setting). This concentration remains well below the annual average NO_2 NEPM of 62 µg/m^3.

The maximum 1-hour average NO_2 GLC monitored at the North Rockingham site is 113 µg/m^3. Under the expansion project the cumulative 1-hour average NO_2 GLC is predicted to increase by approximately 14% to 129 µg/m^3 (ISC3 urban setting). This concentration is equal to 52% of the 1-hour average NO_2 NEPM and is primarily driven by the maximum 1-hour NO_2 GLC measured at North Rockingham. It is also considered highly conservative as it assumes that the monitored and predicted maximum concentrations occur at the same time.

The highest annual average NO_2 GLC monitored at the North Rockingham site is 27 µg/m^3. Under the expansion project the cumulative annual average NO_2 GLC is predicted to increase by 0.4% to 27.1 µg/m^3 (ISC3 urban setting) and remains below the annual average NO_2 NEPM of 62 µg/m^3.

The CSBP expansion project is not expected to impact on the cumulative long-term ambient NH_3 GLCs predicted at the Wells Park monitoring station. The long-term average NH_3 GLC monitored at the Wells Park site is 17 µg/m^3. This concentration is predicted to remain unchanged under the expansion project and complies comfortably with the annual average ammonia UKEA EAL of 180 µg/m^3.

Comparison of the predicted cumulative GLCs to monitored ambient concentrations, when expressed as a percentage of the relevant ambient air quality criteria, indicates that the expansion project is not expected to have a significant bearing upon achieving compliance with the relevant ambient air quality criteria in Hope Valley, North Rockingham or Wells Park, relative to existing cumulative air quality impacts.

6.2 Start-up Operations

A summary of the maximum off-site 1-hour NO_x concentrations predicted by both the Dispmod and ISC3 dispersion models for start-up conditions under both the baseline and expansion emissions scenarios is presented in Table 9. Each scenario has been modelled assuming Nitric Acid Plant 2 is operating under start-up conditions for 30-minutes and then normally for the other 30 minutes of every hour, while all other sources of NO_x emissions are operating under normal conditions.

NO_2 concentrations have been calculated from the predicted NO_x concentrations using the Dames and Moore (1993) equation (refer to Section 5.5). The predicted concentrations have been compared to the relevant ambient air quality criteria and are expressed as percentages of the guideline values. The concentrations highlighted in bold represent the highest off-site GLC predicted by the alternate models and model options applied. Contours of the most conservative maximum 1-hour average NO_2 GLCs as predicted by Dispmod are presented as Figure 11.

Table 9: Summary of Maximum Predicted Off-site GLCs (µg/m³) – Start-up Operations

Compound	Averaging Period	Baseline Emissions Scenario			Expansion Emissions Scenario		
		Dispmod	ISC3		Dispmod	ISC3	
			Rural	Urban		Rural	Urban
NO_x	1-hour	**403**	257	300	**524**	345	429
NO_2	1-hour	**176**	127	143	**205**	158	183
	Guideline[1]	246	246	246	246	246	246
	% Guideline	**72%**	51%	58%	**83%**	64%	75%

Notes
1. Source: NEPC (2003).

The data presented in Table 9 indicates that the maximum off-site 1-hour NO_2 GLCs predicted for start-up operations are expected to increase following the expansion project, although remain below the applicable ambient air quality criteria. The Dispmod model predicts higher GLCs than the ISC3 model. This is likely to be a result of start-up emissions from the Nitric Acid Plant 2 stack (which primarily drive the maximum predicted GLCs), being free from building wakes and the dominant influence of coastal fumigation (as considered in the Dispmod model) on the dispersion of emissions from this source.

The maximum off-site 1-hour average NO_2 GLC predicted under the expansion scenario is 205 µg/m³. This concentration is 16% higher than the maximum 1-hour average NO_2 GLC predicted for the baseline scenario, although remains below the 1-hour average NEPM for NO_2 of 246 µg/m³. The peak off-site 1-hour average NO_2 concentrations are predicted to occur along the western boundary of the site, as illustrated in Figure 11.

6.3 Shutdown Operations

A summary of the maximum off-site 1-hour NO_x concentrations predicted by both the Dispmod and ISC3 dispersion models for shutdown conditions under both the baseline and expansion emissions scenarios is presented in Table 10. The baseline scenario has been modelled assuming Nitric Acid Plants 1 and 2 are shutting down, while all other sources of NO_x emissions are operating under normal conditions. The expansion scenario has been modelled assuming Nitric Acid Plants 1, 2 and 3 are shutting down and all other sources of NO_x emissions are operating as normal.

NO_2 concentrations have been calculated from the predicted NO_x concentrations using the Dames and Moore (1993) equation (refer to Section 5.5). The predicted concentrations have been compared to the relevant ambient air quality criteria and are expressed as percentages of the guideline values. The concentrations highlighted in bold represent the highest off-site GLC predicted by the alternate models and model options applied. Contours of the most conservative maximum 1-hour average NO_2 GLCs as predicted by ISC3 (urban setting) are presented as Figure 12.

Table 10: Summary of Maximum Predicted Off-site GLCs (µg/m^3) – Shutdown Operations

Compound	Averaging Period	Baseline Emissions Scenario			Expansion Emissions Scenario		
		Dispmod	ISC3		Dispmod	ISC3	
			Rural	Urban		Rural	Urban
NO_x	1-hour	302	279	**260**	442	373	**400**
NO_2	1-hour	143	135	**128**	187	167	**175**
	Guideline[2]	246	246	246	246	246	246
	% Guideline	58%	55%	**52%**	76%	68%	**71%**

Notes
1. Source: NEPC (2003).

The data presented in Table 10 indicates that the maximum off-site 1-hour NO_2 GLCs predicted for shutdown operations are expected to increase following the expansion project, while remaining below the NEPM ambient air quality criteria. The ISC3 model (using the urban setting) predicts higher GLCs than the Dispmod model. This is likely to be a result of the building wake effects on the predicted plume dispersion.

The maximum off-site 1-hour average NO_2 GLC predicted under the expansion scenario is 175 µg/m^3. This concentration is 37% higher than the maximum 1-hour average NO_2 GLC predicted for shutdown operations under the baseline scenario, although remains below the 1-hour average NEPM for NO_2 of 246 µg/m^3. The peak off-site 1-hour average NO_2 concentrations are predicted to occur along the western boundary of the site, as illustrated in Figure 12.

6.4 Contribution to Photochemical Smog Pollution

Photochemical smog is an air pollution problem common in large cities. It is characterised by high ozone concentrations at ground level, and can be generated through the interaction of NO_x and reactive organic compounds (ROC) in the environment. Potential sources of NO_x and ROC include industrial processes, vehicle exhausts and bushfires.

Current ambient air quality monitoring of ozone concentrations reported by the DEC (2010) for the Perth airshed indicate that the NEPM 1-hour and 4-hour ozone standards (0.10 ppm and 0.08 ppm respectively) were exceeded at the inland Caversham and Rolling Green monitoring sites (located more than 40 km north east of Kwinana) during 2009. Only the 4-hour ozone concentrations recorded at Rolling Green did not meet the NEPM goal of no more than 1-day in excess of the standard. The DEC (2010) indicated that these events were smoke induced and were the first exceedences of the NEPM 1-hour and 4-hour ozone standards recorded since 2004.

The Perth Photochemical Smog Study (Western Power and Department of Environmental Protection, 1996) found that the control of photochemical smog is a complex issue in the Perth airshed. The study also reported that motor vehicles were the dominant cause of photochemical smog in the Perth airshed being the largest emission sources of NO_x and ROC.

Overall CSBP is a relatively small emitter of NO_x in the Perth airshed. Data from the National Pollutant Inventory (NPI) for 2008-2009 indicates that CSBP emitted 340 tonnes of NO_x compared to the total airshed emissions of 58,090 tonnes (or 0.59% of the total airshed emissions). In considering these figures, the 2008-2009 NPI data indicate that within the Perth airshed approximately 41,717 tonnes (out of the total of 58,090 tonnes) of NO_x emissions are from diffuse (i.e. non industrial) sources including motor vehicles (28,000 tonnes) and biogenic sources (8,400 tonnes) and that these diffuse emission estimates are for 1999.

The proposed NAP Expansion Project will apply Best Available Techniques (BAT) for controlling NO_x emissions and is conservatively estimated to add approximately 150 tonnes per year of NO_x to the Perth airshed (i.e. a further 0.26% to the total airshed NOx emissons). Due to the complexity of photochemistry in the Perth airshed, it is difficult to reliably quantify the impact of such a small increase in the overall NO_x emissions as the change in the total airshed's emission is very small and would be no more than "noise" in any numerical modelling assessment.

The Perth Photochemical Smog Study found that the emissions from the KIA "resulted in a significant quenching of ozone across those portions of the metropolitan area impacted by the Kwinana NO_x plume" (Western Power and Department of Environmental Protection, 1996). This quenching was due to the presence of NO and a low ROC:NO_x ratio within the KIA emissions. Therefore, as the proposal will result in a small increase in the airshed's NO_x emissions, it may result in further slight quenching of ozone in the airshed. The proposal will result in a small reduction in the ROC-NO_x ratio which may also contribute to a small reduction in the ozone formation potential.

7 Conclusions

Air dispersion modelling has been undertaken to assess the potential air quality impacts arising from the atmospheric emissions from CSBP's ammonium nitrate expansion project at the Kwinana Industrial Complex. The modelling approach used for the assessment is conservative (i.e. tends to over-predict GLCs) throughout, and as such the results are considered to be representative of potential worst-case air quality impacts.

The results of the air dispersion modelling assessment indicate that atmospheric emissions associated with the expansion project at the CSBP Kwinana Industrial Complex are not likely to result in unacceptable air quality impacts.

Under normal operating conditions, the model results indicate that the expansion project is likely to result in a 50% increase in the predicted maximum off-site 1-hour and annual average NO_2 GLCs. The maximum short-term and long-term off-site NH_3 and PM (as $PM_{2.5}$) GLCs predicted for the expansion emissions scenario are expected to remain unchanged.

The predicted concentrations for CSBP's operations in isolation and under the expansion emissions scenario comply with the relevant ambient air quality criteria, as follows:

- the maximum predicted 1-hour average NH_3 concentration of 25 µg/m^3 is equal to 3.3% of the Vic SEPP equivalent 1-hour average design criteria for NH_3;
- the maximum predicted annual average NH_3 GLC of 1.1 µg/m^3 is equal to 0.6% of the corresponding UKEA EAL;
- the maximum predicted 24-hour average PM (as $PM_{2.5}$) concentration of 13.5 µg/m^3 is equal to 54% of the 24-hour average $PM_{2.5}$ advisory reporting standard. As all of the particulate emissions were assumed to be $PM_{2.5}$, compliance with the $PM_{2.5}$ standard also demonstrates compliance with the 24-hour average PM_{10} NEPM of 50 µg/m^3. Emissions from the Prilling Plant contribute less than 6% to the maximum predicted 24-hour PM (as $PM_{2.5}$) GLCs;
- the maximum predicted annual average PM (as $PM_{2.5}$) concentration of 2.1 µg/m^3 is equal to 27% of the corresponding advisory reporting standard. Emissions from the Prilling Plant contribute less than 6% to the maximum predicted annual average PM (as $PM_{2.5}$);
- the maximum predicted 1-hour average NO_2 concentration of 82 µg/m^3 is equal to 34% of the 1-hour average NEPM for NO_2; and
- the maximum predicted annual average NO_2 concentration of 3.0 µg/m^3 is equal to 4.9% of the corresponding NEPM.

Under start-up and shutdown operations, the expansion project is expected to lead to increases of 16% and 31% respectively in the maximum 1-hour average NO_2 GLCs. However, the predicted concentrations for CSBP's operations in isolation comply with the NEPM criteria, as follows:

- With the Nitric Acid Plant 2 operating under start-up conditions for 30-minutes and then normally for the other 30 minutes of every hour and the remaining NO_2 emission sources operating under normal conditions, the maximum predicted 1-hour average

NO_2 concentration is 205 µg/m^3 and is equal to 83% of the 1-hour average NEPM for NO_2; and

- With Nitric Acid Plants 1, 2 and 3 operating under shutdown conditions and other NO_2 emission sources at normal conditions, the maximum predicted 1-hour average NO_2 concentration is 187 µg/m^3 and is equal to 76% of the 1-hour average NEPM for NO_2.

The maximum predicted concentrations for start-up and shutdown conditions are considered to be conservative as the emissions are expected to occur less than 1% of the time, and hence may not necessarily coincide with the occurrence of worst-case meteorological conditions.

Assessment of the cumulative impact of emissions associated with normal operations under the expansion scenario and background levels of air pollutants in the Kwinana area indicates that the expansion project may conservatively result in an increase in short-term ambient NO_2 GLCs at the Hope Valley and North Rockingham monitoring stations, as follows:

- the cumulative 1-hour NO_2 GLC is predicted to increase by approximately 7% to 185 µg/m^3 at Hope Valley; and
- the cumulative 1-hour NO_2 GLC is predicted to increase by 14% to 129 µg/m^3 at North Rockingham.

The cumulative concentrations however, are driven by the maximum measured NO_2 GLCs at each site and are considered highly conservative as it assumes that the monitored and predicted maximum concentrations occur at the same time.

CSBP's normal operations are predicted to contribute less than 1% to the cumulative annual average NO_2 GLC at the Hope Valley and North Rockingham sites and predicted increases associated with the expansion project are minimal. At Wells Park, the modelled sources are also predicted to contribute less than 1% to the cumulative long-term NH_3 average and the expansion project is not expected to impact on the ambient concentration.

Assessment of the impact of increased NO_x emissions on photochemical smog levels in the Perth airshed indicates that the proposed expansion project is conservatively expected to result in an increase of 0.26% to the total Perth airshed emissions of NO_x based on the 2008-2009 NPI data. While this increase is considered to be too small to be meaningfully considered within a complex photochemistry model, it is qualitatively expected to result in small additional quenching of ozone in the Perth airshed. The proposal is also expected to result in a very small reduction in the ROC-NO_x ratio which may also contribute to a very small reduction in the ozone formation potential of the Perth airshed.

A conservative approach has been adopted throughout the modelling assessment, including definition of the emissions for each of the modelled sources, set-up of the air dispersion models, calculation of NO_2 concentrations from predicted NO_x concentrations, assessment of the cumulative impacts of the expansion project and assessment of the impacts under start-up and shutdown conditions.

8 References

CSBP Limited (CSBP). 2005. “Ammonium Nitrate Production Facility Expansion Project Public Environmental Review.” CSBP, February 2005.

Dames and Moore. 1993. “Proposed Integrated Steel Mill and Utilities Complex. East Rockingham Industrial Park near Kwinana. Environmental Review and Management Plan.” Report prepared for Compact Steel, December 1993.

Department of Environment and Conservation (DEC). 2009a. “2008 Western Australia Air Monitoring Report.” Technical Report AQM 4, December 2009.

Department of Environment and Conservation (DEC). 2009b. “Redetermination of maximum permissible quantities of sulphur dioxide under the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999.” DEC, July 2009.

Department of Environment and Conservation (DEC). 2010. “2009 Western Australia Air Monitoring Report.” July 2010.

Environmental Consultancy Services (ECS). 2008. “Granulation Plant Deduster Annual Compliance.” ECS Report Number R08327, 22 October 2008.

ENVIRON Australia Pty Ltd (ENVIRON). 2008. “Air Quality Assessment Report – Chemical and Fertiliser Production Plants.” Report prepared for CSBP Limited, January 2008.

Environmental Protection Authority (EPA). (2009). “State Environmental (Ambient Air) Policy 2009.” Environmental Protection Authority, June 2009.

European Fertilizer Manufacturers Association (EFMA). 2000. “Best Available Techniques for Pollution Prevention and Control in the European Fertilizer Industry. Booklet No. 2 of 8: Production of Nitric Acid.” European Fertilizer Manufacturers Association.

Hanna SR, Briggs GA, Deardroff J, et al. 1977. “Summary of recommendations made by the AMS workshop on stability classification schemes and sigma curves.” Bulletin of American Meteorological Society 58: 1305–9.

National Environmental Protection Council (NEPC). 2003. “National Environmental Protection (Ambient Air Quality Measure).” National Environmental Protection Council, July 2003.

United Kingdom Environmental Agency (UKEA). 2009. “H1 Environmental Risk Assessment – Annex F Air Emissions.” Environmental Agency, UK.

Victorian Environmental Protection Authority (Vic EPA). 2001. “State Environmental Protection Policy (Air Quality Management).” Victorian Government Gazette No. S240, 21 December 2001.

Western Power and Department of Environmental Protection. 1996. “The Perth Photochemical Smog Study.” May, 1996.

9 Limitations

ENVIRON Australia prepared this report in accordance with the scope of work as outlined in our proposal to CSBP Limited dated 26 February 2010 and in accordance with our understanding and interpretation of current regulatory standards.

Site conditions may change over time. This report is based on conditions encountered at the site at the time of the report and ENVIRON disclaims responsibility for any changes that may have occurred after this time.

The conclusions presented in this report represent ENVIRON's professional judgement based on information made available during the course of this assignment and are true and correct to the best of ENVIRON's knowledge as at the date of the assessment.

ENVIRON did not independently verify all of the written or oral information provided to ENVIRON during the course of this investigation. While ENVIRON has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to ENVIRON was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

9.1 User Reliance

This report has been prepared exclusively for CSBP Limited and may not be relied upon by any other person or entity without ENVIRON's express written permission.

FINAL

Figures

Figure 1

Locations of the CSBP Kwinana Industrial Complex

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

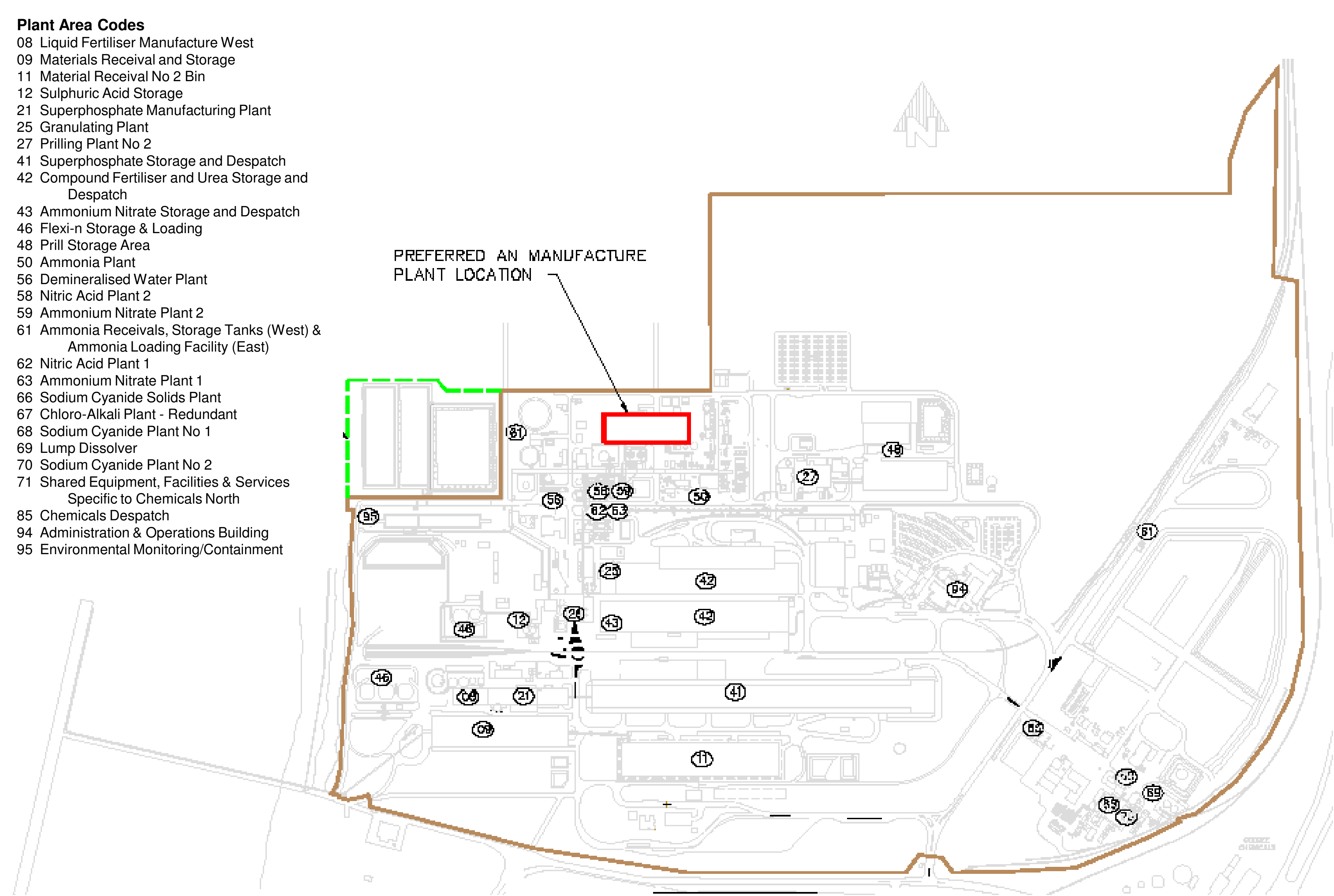


Figure 2

CSBP Kwinana Industrial Complex Site Layout

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Supplied by CSBP	Date: August 2010

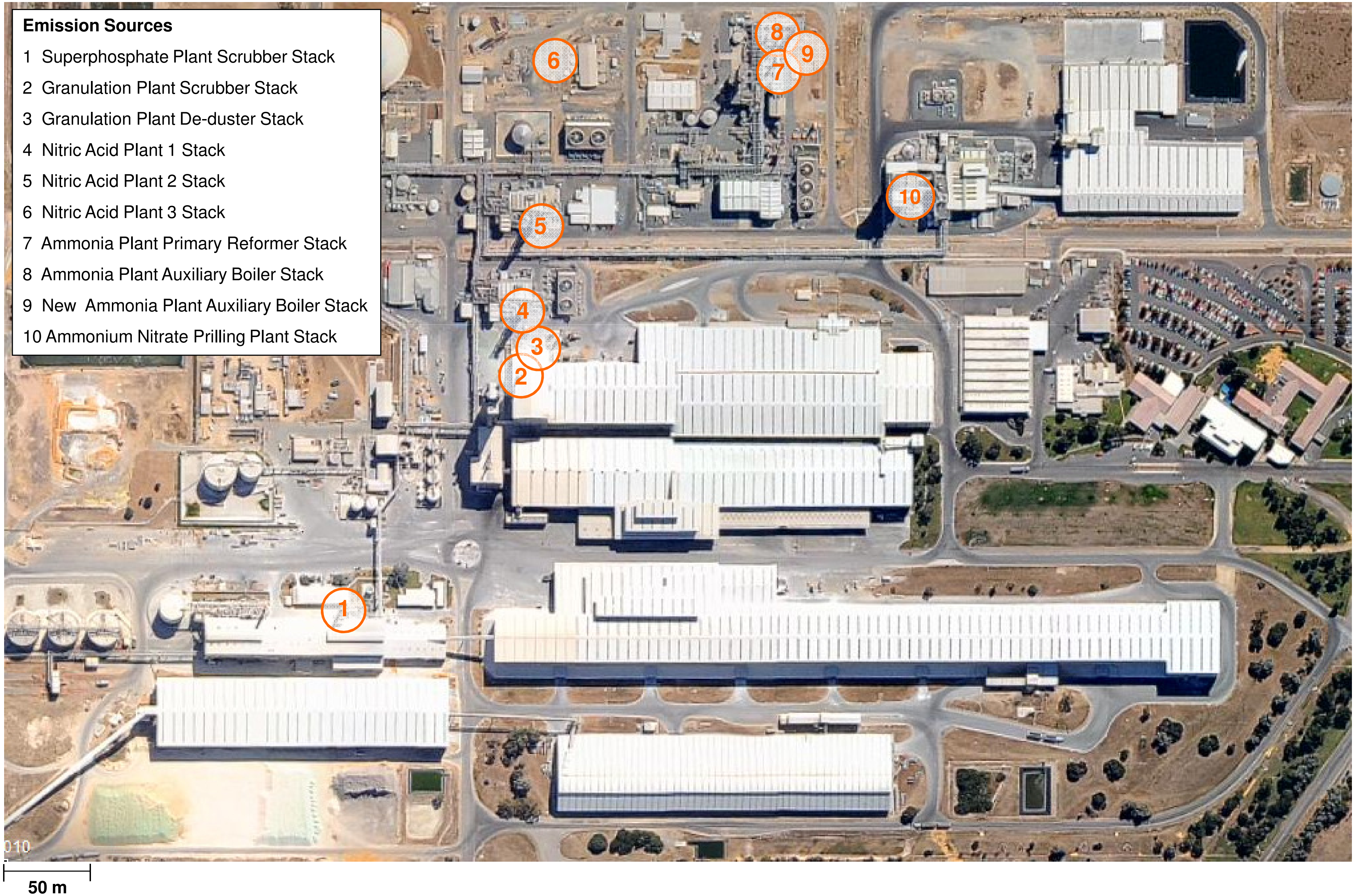
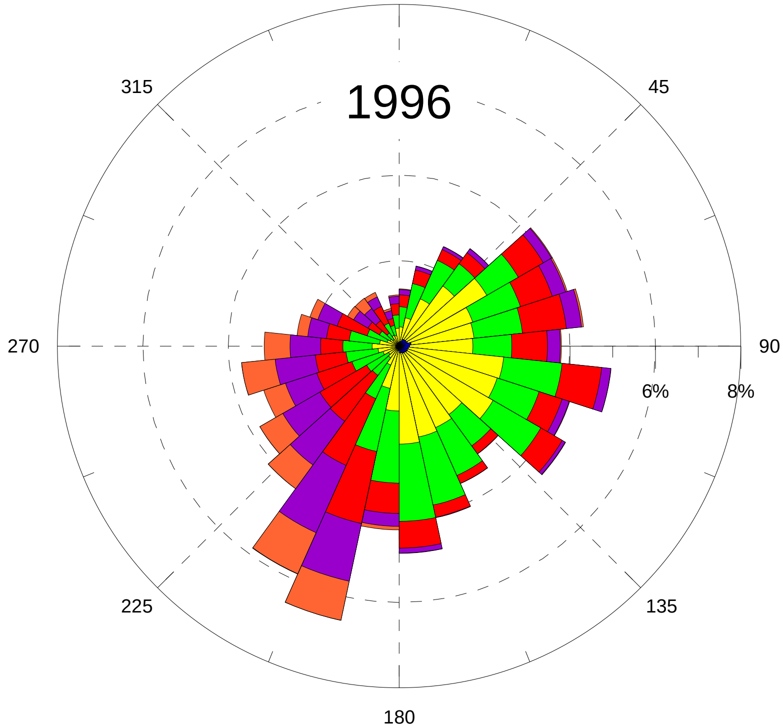


Figure 3

Location of the Modelled Emission Sources

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010



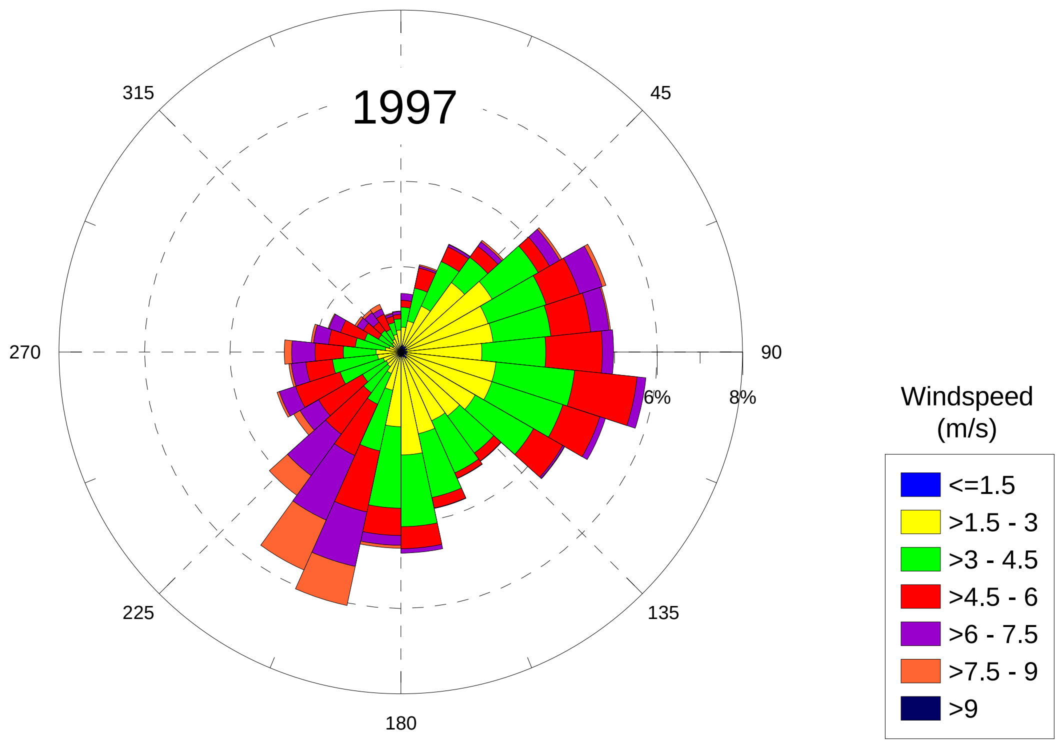


Figure 4

1996 and 1997 Annual Windroses, Hope Valley

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

Baseline Emissions Scenario | Expansion Emissions Scenario

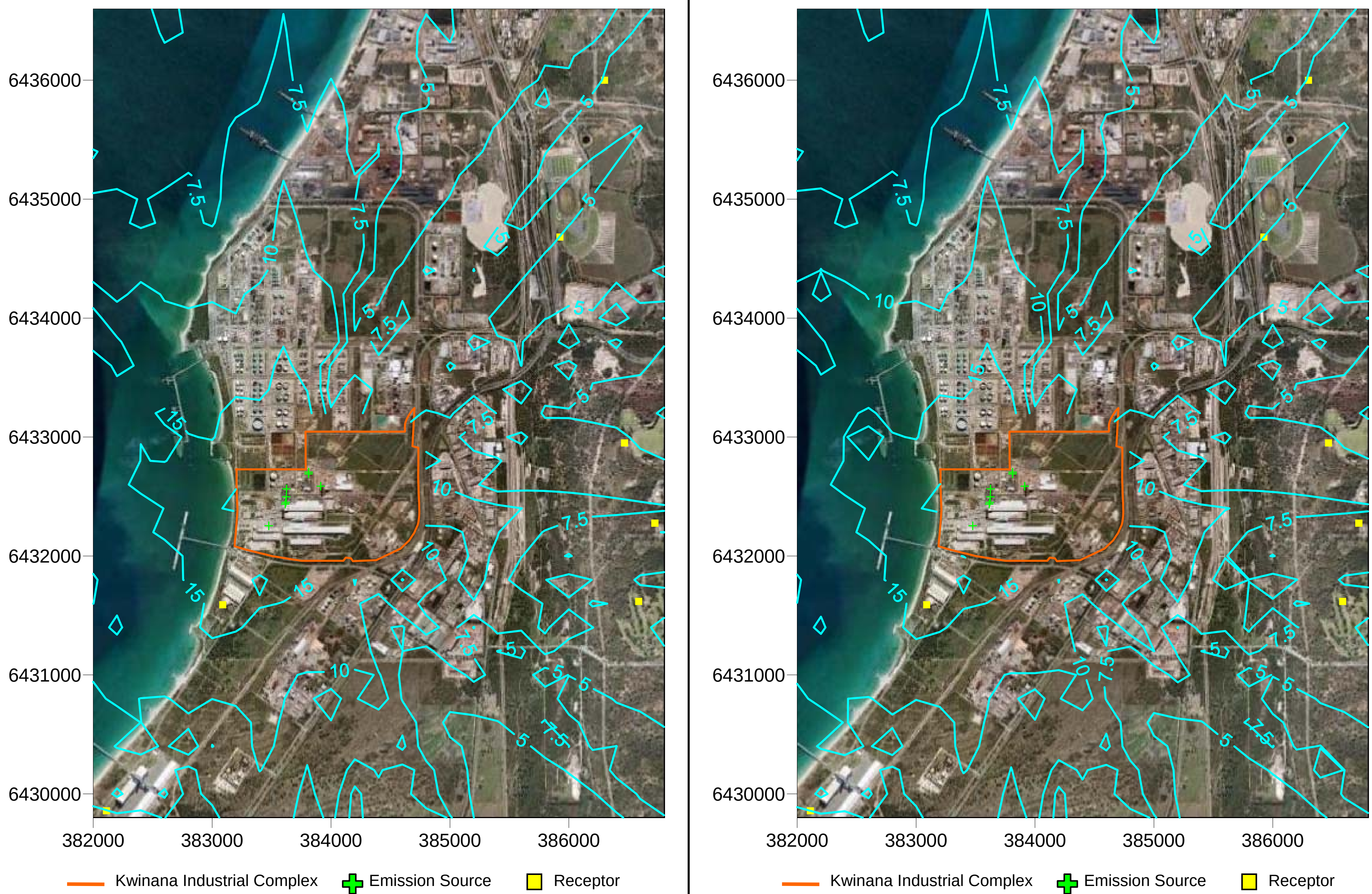


Figure 5 **Maximum Predicted 1-hour NH_3 GLCs – Normal Operations** ISC3 – Rural	Client: CSBP Limited	ENVIRON	
	Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

Baseline Emissions Scenario | **Expansion Emissions Scenario**

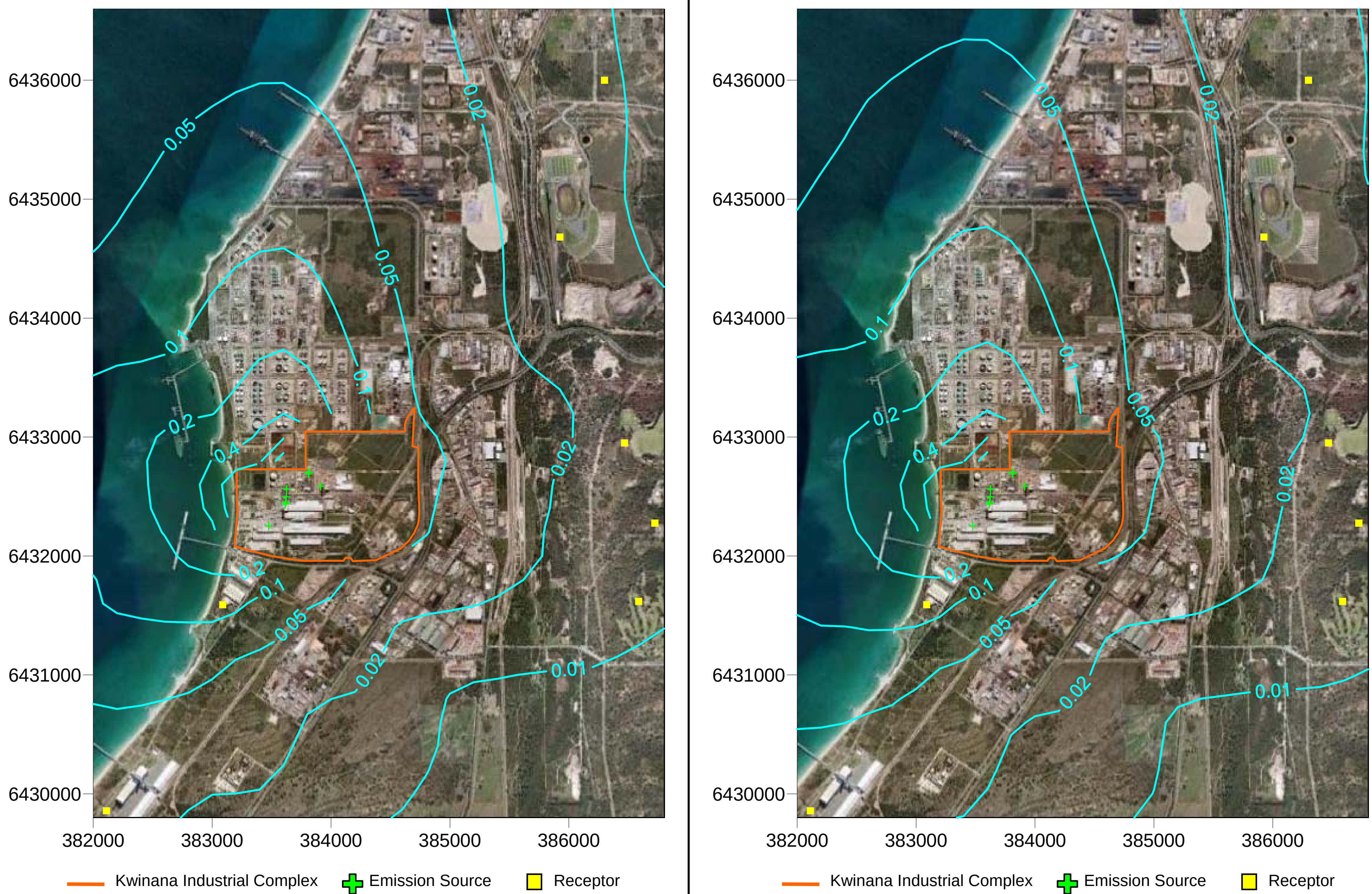


Figure 6

Predicted Annual Average NH_3 GLCs – Normal Operations
ISC3 – Urban

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

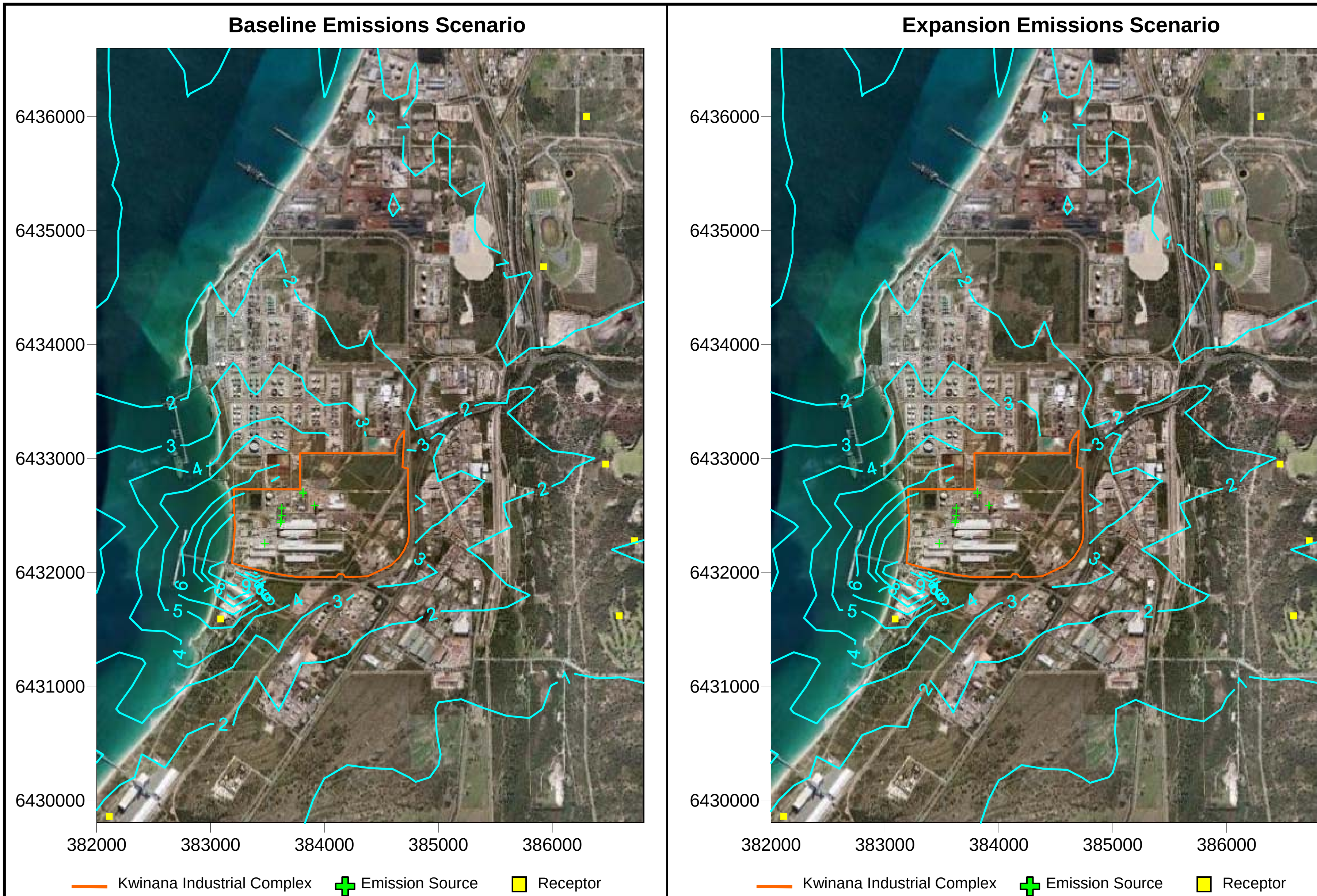


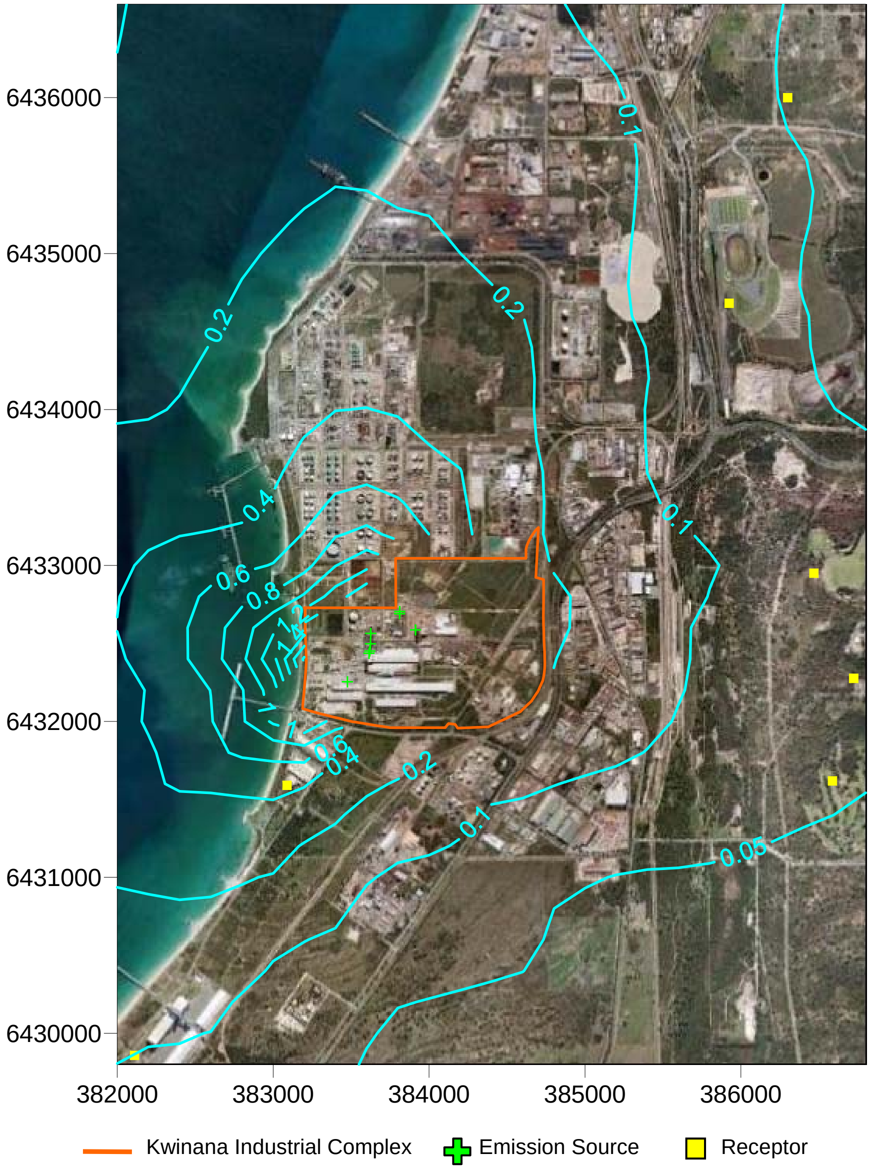
Figure 7

Maximum Predicted 24-hour PM (as $PM_{2.5}$) GLCs – Normal Operations

ISC3 – Rural

Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

Baseline Emissions Scenario



Expansion Emissions Scenario

Figure 8

Predicted Annual Average PM (as $PM_{2.5}$) GLCs – Normal Operations

ISC3 – Rural

Client: CSBP Limited	ENVIRON
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR / Date: August 2010

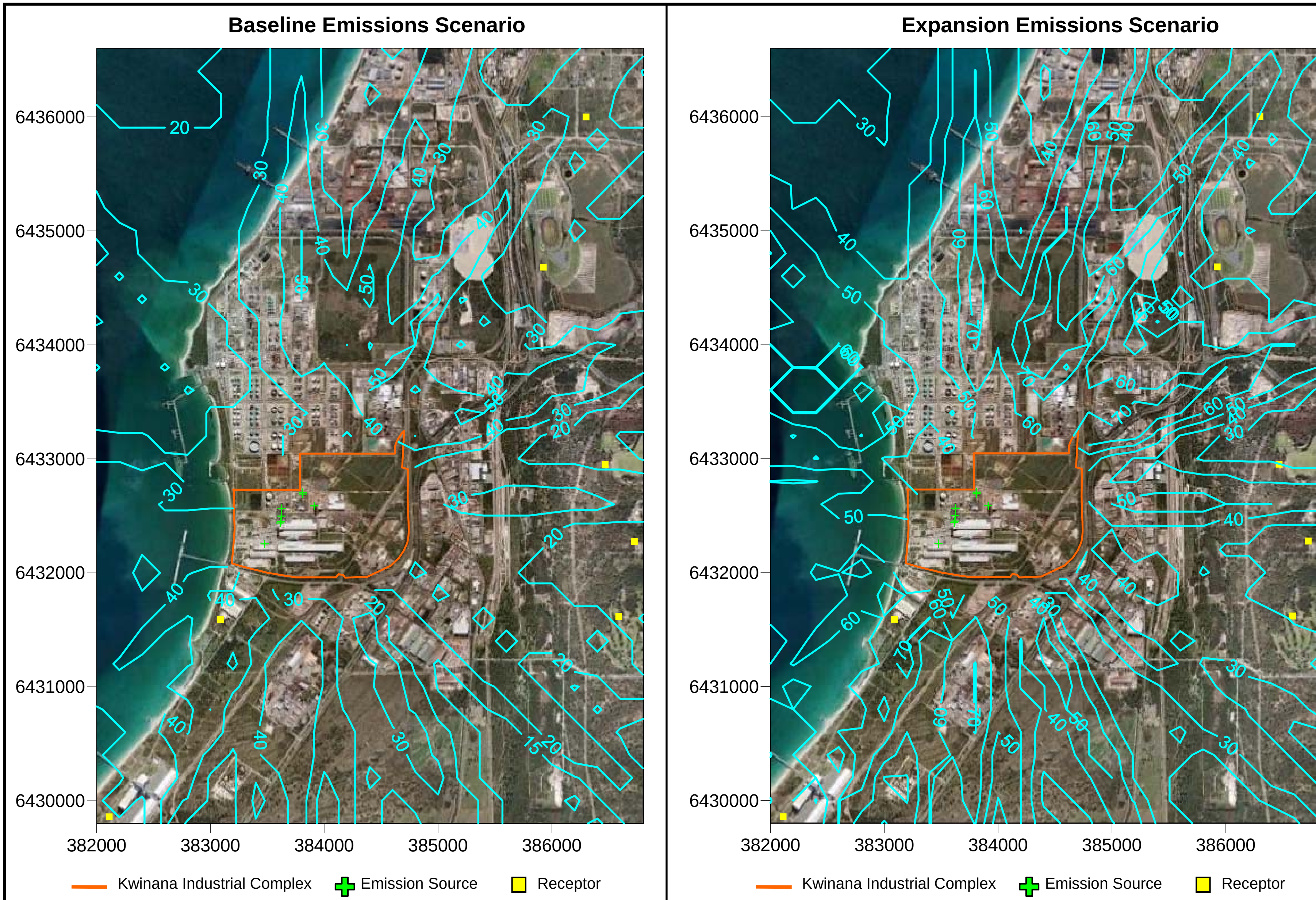


Figure 9	Client: CSBP Limited
Maximum Predicted 1-hour NO_2 GLCs – Normal Operations ISC3 – Urban	Project: Kwinana Ammonium Nitrate Expansion

Drawn: RR	Date: August 2010

Baseline Emissions Scenario

Expansion Emissions Scenario

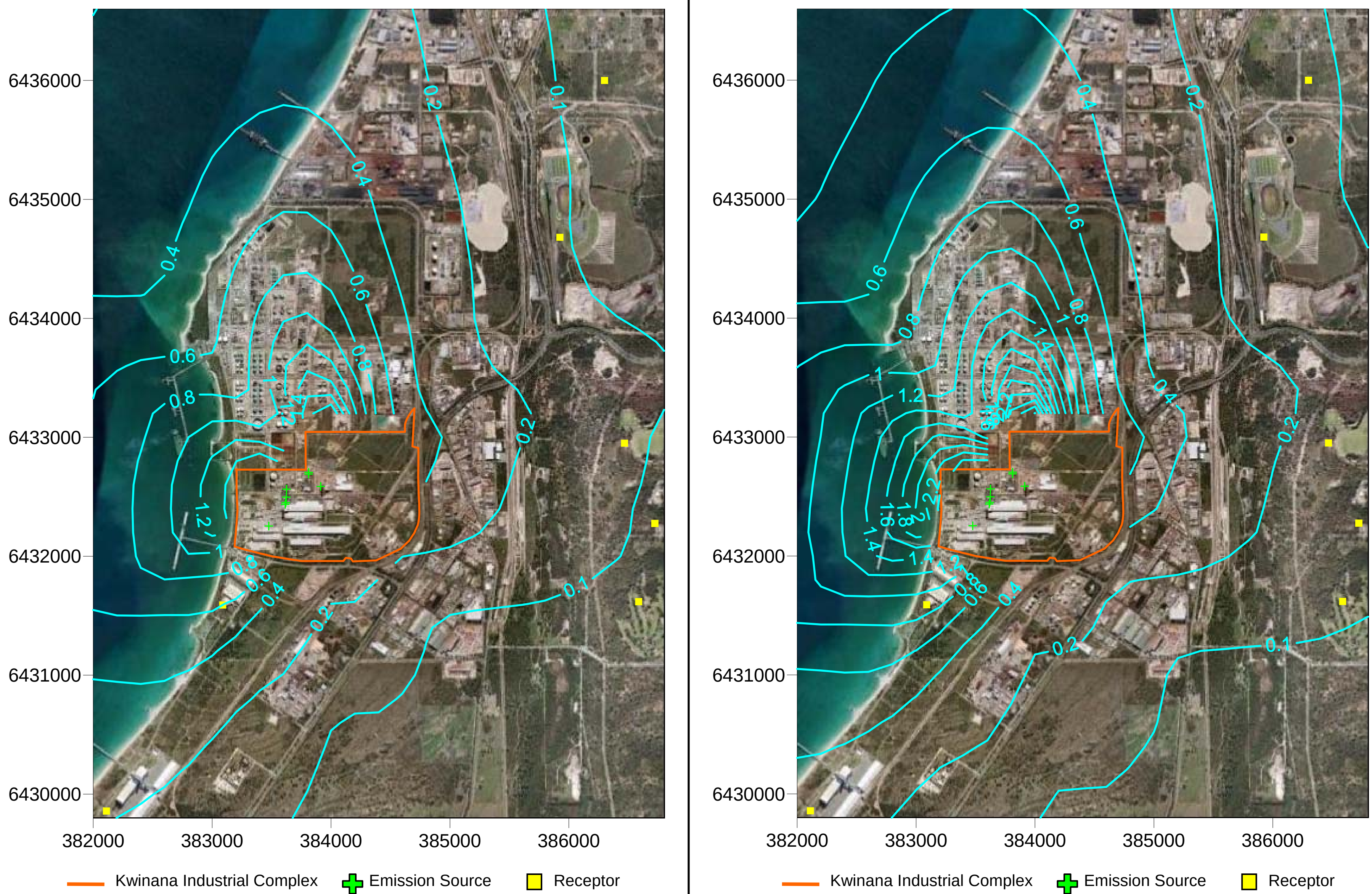


Figure 10

Predicted Annual Average NO_2 GLCs – Normal Operations
ISC3 – Urban

Client: CSBP Limited	ENVIRON
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR / Date: August 2010

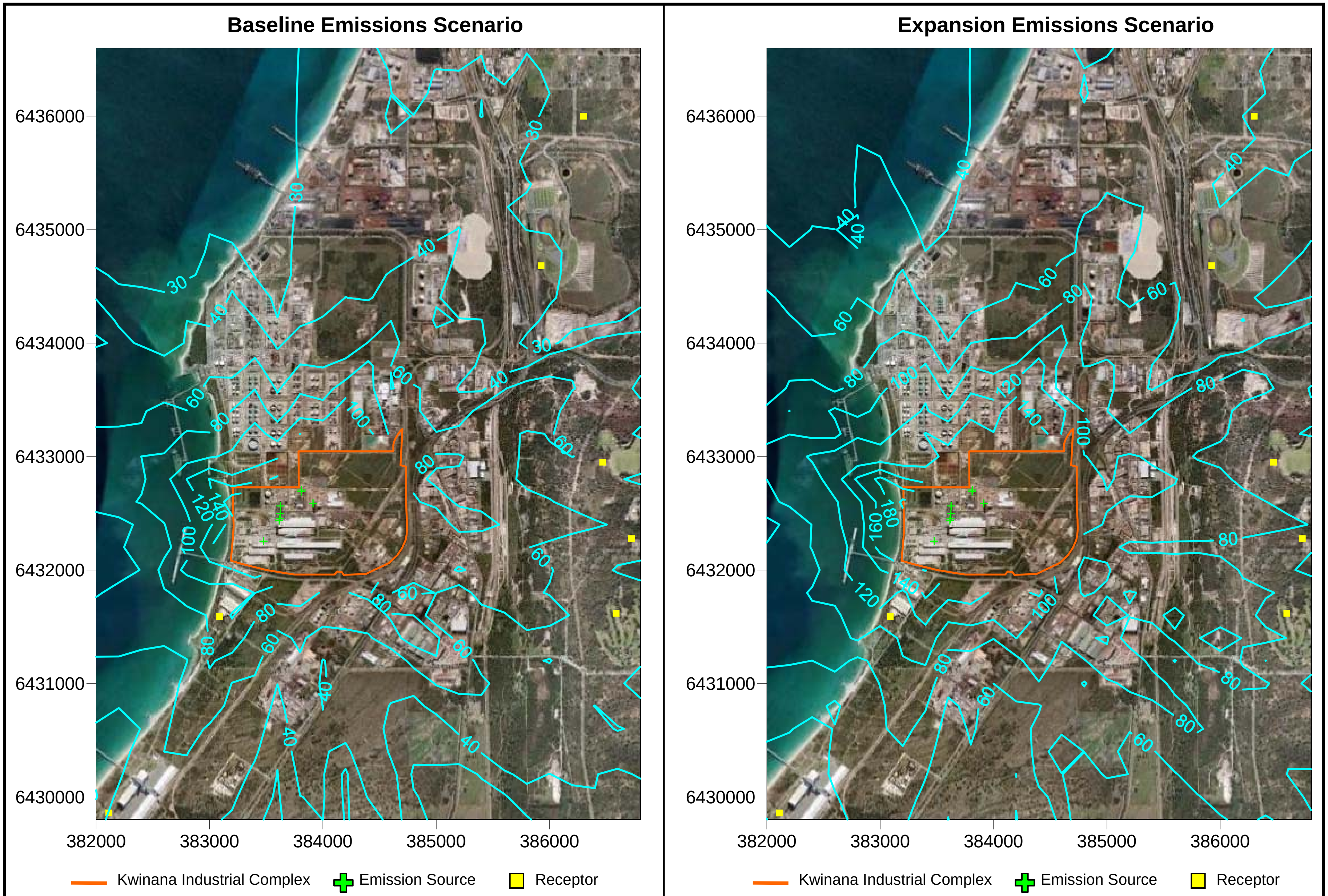
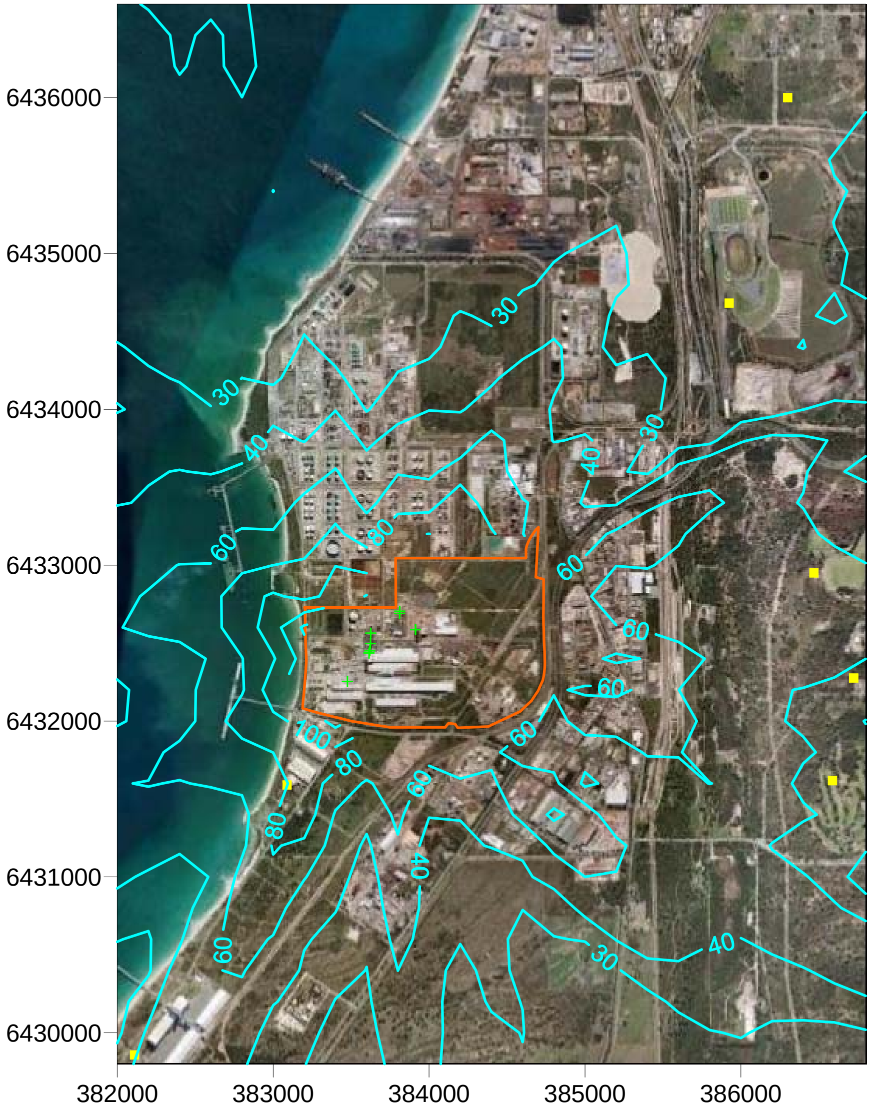


Figure 11

Maximum Predicted 1-hour NO_2 GLCs – Start-up Operations
Dispmod

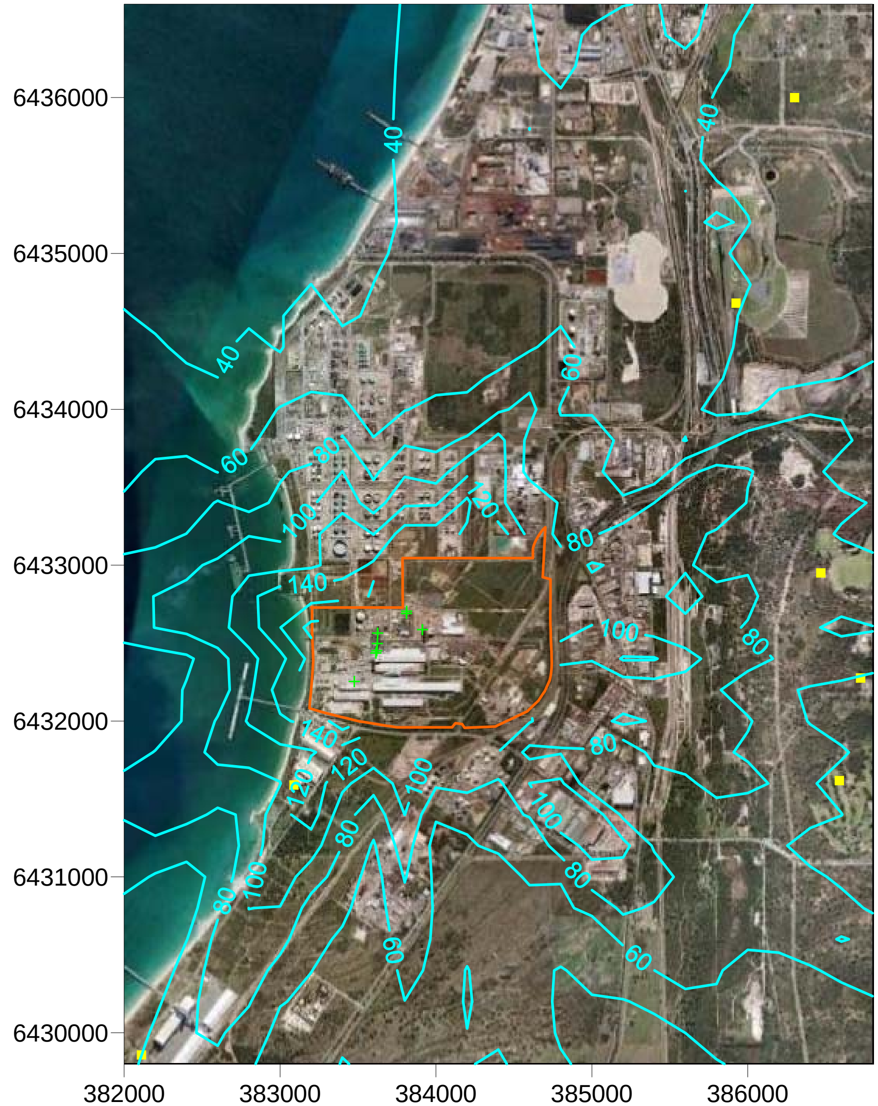
Client: CSBP Limited	ENVIRON	
Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

Baseline Emissions Scenario



Kwinana Industrial Complex Emission Source Receptor

Expansion Emissions Scenario



Kwinana Industrial Complex Emission Source Receptor

Figure 12 **Maximum Predicted 1-hour NO_2 GLCs – Shutdown Operations** ISC3 Urban	Client: CSBP Limited	ENVIRON	
	Project: Kwinana Ammonium Nitrate Expansion	Drawn: RR	Date: August 2010

FINAL

Appendix A
Dispmod Input Files

Control File

```
CSBP Kwinana Ammonium Nitrate Expansion Air Dispersion Modelling -
Expansion Case 11/7/10 Rerun
  382000. 6429800. 0200. 25 35 0.2833 -32.0 181.7 360.0   3.0  .083  .047
0.25
 01011996 31121996 0000 2400  3  1 77  1.9  2.3
 14 0.00 0350. 0500. 0700. 1000. 0   5000.
  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  2  3  4  5  6  7  8  9 10 11 12 13 14
  0         ! NUMBER OF STACKS THAT ARE NOT BEING USED
SMP SCRUBBER   37.4 2.50 383476 6432254 1.00  0. 312
GRAN SCRUBBER  43.1 1.83 383615 6432437 1.00  0. 430
GRAN DEDUSTER  36.8 1.58 383620 6432451 1.00  0. 430
NAP1           63.8 1.10 383624 6432497 1.00  0. 460
NAP1 SHUTDOWN  63.8 1.10 383624 6432497 1.00  0. 460
AP REFORM      30.0 2.13 383811 6432690 1.00  0. 640
AP AUX BOILER  30.0 1.20 383812 6432704 1.00  0. 640
NEW AUX BOIL   30.0 1.20 383824 6432697 1.00  0. 655
NAP2           70.7 1.10 383626 6432564 1.00  0. 456
NAP2 START UP  70.7 1.10 383626 6432564 1.00  0. 456
NAP2 SHUTDOWN  70.7 1.10 383626 6432564 1.00  0. 456
NAP3           70.7 1.10 383633 6432672 1.00  0. 465
NAP3 SHUTDOWN  70.7 1.10 383633 6432672 1.00  0. 465
PRILL PLANT 2  65.0 1.72 383913 6432587 1.00  0. 728
0
```

Emissions File – Non-statistical Mode

```
CSBP Kwinana Ammonium Nitrate Expansion Air Dispersion Modelling -
Expansion Case 11/7/10 Rerun
Name                Q       V     Rho  Nd  Nh Int
SMP SCRUBBER      .001     27.9   1.126          1
GRAN SCRUBBER     .001     18.7   1.074          1
GRAN DEDUSTER     .001     24.0   1.129          1
NAP1              .001     39.5   0.939          1
NAP1 SHUTDOWN     .001     39.5   1.129          1
AP REFORM         .001     48.9   0.774          1
AP AUX BOILER     .001      6.5   0.802          1
NEW AUX BOIL      .001      9.7   0.802          1
NAP2              .001     39.5   0.939          1
NAP2 START UP     .001     21.2   1.129          1
NAP2 SHUTDOWN     .001     39.5   1.129          1
NAP3              .001     39.5   0.939          1
NAP3 SHUTDOWN     .001     39.5   1.129          1
PRILL PLANT 2     .001     48.1   1.129          1
```

Emissions File – Statistical Mode

```
CSBP - Probabilistic NOx Assessment - Expansion DM

columns are Q (kg/s), V(m**3/s), rho(kg/m**3)

No. industries  4


Industry No.  1  No. cases   3  No. stacks 1
```

```
Case 1  Typical         probability 0.96000
NAP1            .00341    39.5    .932    1

Case 2  Peak            probability 0.02000
NAP1            .00427    39.5    .932    1

Case 3  Licence         probability 0.02000
NAP1            .01166    39.5    .932    1


Industry No.  2  No. cases   3  No. stacks  1

Case 1  Typical         probability 0.96000
NAP2            .00341    39.5    .932    1

Case 2  Peak            probability 0.02000
NAP2            .00427    39.5    .932    1

Case 3  Licence         probability 0.02000
NAP2            .01166    39.5    .932    1


Industry No.  3  No. cases   3  No. stacks  1

Case 1  Typical         probability 0.96000
NAP3            .00341    39.5    .932    1

Case 2  Peak            probability 0.02000
NAP3            .00427    39.5    .932    1

Case 3  Licence         probability 0.02000
NAP3            .01166    39.5    .932    1


Industry No.  4  No. cases   1  No. stacks  3

Case 1  Other           probability 1.00000
AP REFORM        .00517   48.9   0.774    0
AP AUX BOILER    .00159    6.5   0.802    0
NEW BOILER       .00239    9.7   0.802    0
```

Dispmod Input File

```
CSBP_Exp.ctl
z.out
y            ! plume spread in s.b. due to self gen turb?
y            ! use new PDF model for TIBL fumigation?
N            ! account for wind shear in TIBL PDF fumigation?
y            ! use numerical method to calculate TIBL height
95.              ! Tibl integration distance
y                ! use coastal AMG file
kwinana_GDA94.coa
Y            ! use pdf for convective dispersion within TIBL & PBL?
N            ! account for wind shear within the TIBL?
N            ! use stability classes? - not with PDF
N            ! plume centreline mode?
4            ! option for lapse rate determination
Y            ! apply seasonal variation to lapse rates?
N            ! use measured sigma theta?
n                ! mixing into TIBL sharper than SGPHI?
```

```
y           ! if direction meander sigma greater, use it
n           ! info to screen on big timestep concs?
2           ! plume penetration: 1 ISC, 2 Manins, 3 Ausplume, 4 Aermod
(Berkowicz)
n           ! include invers temp jump in pot temp lapse rate for
pentration?
y               ! write all concs to disk for post-processing?
wml_0-0_96.dat
pmkwin.dat
CSBP_Exp.emi
w_veer.dat
```

Appendix B
ISC Input File

FINAL

** BREEZE ISC GIS Pro v5.1.0 - V:\Expansion Emissions Scenario\ISC_Rural_Exp\CSBP Expansion - Rural.dat
** Trinity Consultants

** PRIME

CO STARTING
CO TITLEONE CSBP Kwinana Ammonium Nitrate Expansion Air Dispersion Modelling
CO TITLETWO Rural Landuse Selected - Expansion Emissions Scenario
CO MODELOPT DFAULT CONC RURAL
CO AVERTIME 1 ANNUAL
CO POLLUTID NOX_SHUT
CO TERRHGTS FLAT
CO RUNORNOT RUN
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION SRC1 POINT 383476.2 6432253.8 0
** SRCDESCR Superphosphate Plant Scrubber Stack
SO LOCATION SRC2 POINT 383614.6 6432436.5 0
** SRCDESCR Granulation Plant Scrubber Stack
SO LOCATION SRC3 POINT 383620.0 6432451.5 0
** SRCDESCR Granulation Plant De-Duster Stack
SO LOCATION SRC4 POINT 383624.0 6432497.0 0
** SRCDESCR Nitric Acid Plant 1
SO LOCATION SRC5 POINT 383624.0 6432497.0 0
** SRCDESCR Nitric Acid Plant 1 Shutdown
SO LOCATION SRC6 POINT 383810.8 6432690.2 0
** SRCDESCR Ammonia Plant Primary Reformer Stack
SO LOCATION SRC7 POINT 383812.0 6432704.2 0
** SRCDESCR Ammonia Plant Auxiliary Boiler Stack
SO LOCATION SRC8 POINT 383824.2 6432697.4 0
** SRCDESCR New Auxiliary Boiler
SO LOCATION SRC9 POINT 383625.7 6432563.6 0
** SRCDESCR NAP2
SO LOCATION SRC10 POINT 383625.7 6432563.6 0
** SRCDESCR NAP2 Start-up
SO LOCATION SRC11 POINT 383625.7 6432563.6 0
** SRCDESCR NAP2 Shutdown
SO LOCATION SRC12 POINT 383632.5 6432672.4 0
** SRCDESCR NAP3
SO LOCATION SRC13 POINT 383632.5 6432672.4 0
** SRCDESCR NAP3 Shutdown
SO LOCATION SRC14 POINT 383913.3 6432586.5 0
** SRCDESCR Prilling Plant 2 Debottlenecked
SO SRCPARAM SRC1 0.000000E+00 37.4 315 5.683741 2.5
SO SRCPARAM SRC2 0.000000E+00 43.1 330 7.109671 1.83
SO SRCPARAM SRC3 0.000000E+00 36.8 307 12.24072 1.58
SO SRCPARAM SRC4 0.000000E+00 63.8 378 41.56443 1.1
SO SRCPARAM SRC5 1.519000E+01 63.8 298 41.56443 1.1
SO SRCPARAM SRC6 5.170000E+00 30 458 13.72334 2.13
SO SRCPARAM SRC7 1.590000E+00 30 443 5.747261 1.2
SO SRCPARAM SRC8 2.390000E+00 30 443 8.576681 1.2
SO SRCPARAM SRC9 0.000000E+00 70.7 378 41.56443 1.1
SO SRCPARAM SRC10 0.000000E+00 70.7 306 22.308 1.1
SO SRCPARAM SRC11 9.800000E+00 70.7 298 41.56443 1.1
SO SRCPARAM SRC12 0.000000E+00 70.7 378 41.56443 1.1
SO SRCPARAM SRC13 9.800000E+00 70.7 298 41.56443 1.1
SO SRCPARAM SRC14 0.000000E+00 65 303 20.70133 1.72
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDHGT SRC1 24.4 24.4 24.4 24.4 24.4 24.4
SO BUILDWID SRC1 136.65 134.74 128.74 118.83 105.31 88.59
SO BUILDWID SRC1 69.18 47.66 24.7 47.66 69.18 88.59
SO BUILDWID SRC1 105.31 118.83 128.74 134.74 136.65 134.4
SO BUILDWID SRC1 136.65 134.74 128.74 118.83 105.31 88.59
SO BUILDWID SRC1 69.18 47.66 24.7 47.66 69.18 88.59
SO BUILDWID SRC1 105.31 118.83 128.74 134.74 136.65 134.4
SO BUILDLEN SRC1 47.66 69.18 88.59 105.31 118.83 128.74
SO BUILDLEN SRC1 134.74 136.65 134.4 136.65 134.74 128.74
SO BUILDLEN SRC1 118.83 105.31 88.59 69.18 47.66 24.7
SO BUILDLEN SRC1 47.66 69.18 88.59 105.31 118.83 128.74
SO BUILDLEN SRC1 134.74 136.65 134.4 136.65 134.74 128.74
SO BUILDLEN SRC1 118.83 105.31 88.59 69.18 47.66 24.7
SO XBADJ   SRC1 -43.65 -59.48 -73.5 -85.29 -94.48 -100.81
SO XBADJ   SRC1 -104.07 -104.17 -101.1 -99.25 -94.39 -86.66
SO XBADJ   SRC1 -76.29 -63.61 -48.99 -32.89 -15.78 1.8
SO XBADJ   SRC1 -4.01 -9.7 -15.09 -20.03 -24.35 -27.94
SO XBADJ   SRC1 -30.68 -32.48 -33.3 -37.4 -40.36 -42.09
SO XBADJ   SRC1 -42.54 -41.7 -39.6 -36.29 -31.88 -26.5
SO YBADJ   SRC1 30.93 27.02 22.28 16.87 10.95 4.7
SO YBADJ   SRC1 -1.7 -8.05 -14.15 -19.82 -24.89 -29.2
SO YBADJ   SRC1 -32.63 -35.06 -36.43 -36.7 -35.84 -33.9
SO YBADJ   SRC1 -30.93 -27.02 -22.28 -16.87 -10.95 -4.7
SO YBADJ   SRC1 1.7 8.05 14.15 19.82 24.89 29.2
SO YBADJ   SRC1 32.63 35.06 36.43 36.7 35.84 33.9
SO BUILDHGT SRC2 33.5 65.3 65.3 65.3 65.3 65.3
SO BUILDHGT SRC2 65.3 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC2 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC2 33.5 65.3 65.3 65.3 65.3 65.3
SO BUILDHGT SRC2 65.3 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC2 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDWID SRC2 50.74 16.54 16.6 16.54 16.54 16.6
SO BUILDWID SRC2 16.54 51.87 48.5 51.98 53.89 54.15
SO BUILDWID SRC2 52.77 49.79 45.29 39.42 55.53 49.7
SO BUILDWID SRC2 50.74 16.54 16.6 16.54 16.54 16.6
SO BUILDWID SRC2 16.54 51.87 48.5 51.98 53.89 54.15

SO BUILDWID SRC2 52.77 49.79 45.29 39.42 55.53 49.7
SO BUILDLEN SRC2 53.34 16.54 16.6 16.54 16.54 16.6
SO BUILDLEN SRC2 16.54 32.35 24.8 32.81 39.82 45.63
SO BUILDLEN SRC2 50.04 52.94 54.23 53.87 51.87 48.5
SO BUILDLEN SRC2 53.34 16.54 16.6 16.54 16.54 16.6
SO BUILDLEN SRC2 16.54 32.35 24.8 32.81 39.82 45.63
SO BUILDLEN SRC2 50.04 52.94 54.23 53.87 51.87 48.5
SO XBADJ SRC2 -36.37 -39.02 -40.76 -41.45 -41.17 -39.91
SO XBADJ SRC2 -37.64 -11.33 -5.7 -8.03 -10.11 -11.89
SO XBADJ SRC2 -13.3 -14.31 -14.89 -15.01 -14.68 -13.9
SO XBADJ SRC2 -16.97 22.47 24.15 24.91 24.63 23.31
SO XBADJ SRC2 21.1 -21.03 -19.1 -24.78 -29.71 -33.74
SO XBADJ SRC2 -36.74 -38.63 -39.34 -38.86 -37.19 -34.6
SO YBADJ SRC2 0.59 12.54 7.01 1.27 -4.51 -10.15
SO YBADJ SRC2 -15.49 -11.26 -10.35 -9.02 -7.42 -5.59
SO YBADJ SRC2 -3.59 -1.48 0.67 2.8 -6.74 -5.75
SO YBADJ SRC2 -0.59 -12.54 -7.01 -1.27 4.51 10.15
SO YBADJ SRC2 15.49 11.26 10.35 9.02 7.42 5.59
SO YBADJ SRC2 3.59 1.48 -0.67 -2.8 6.74 5.75
SO BUILDHGT SRC3 33.5 65.3 65.3 65.3 65.3 33.5
SO BUILDHGT SRC3 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC3 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC3 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC3 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDHGT SRC3 33.5 33.5 33.5 33.5 33.5 33.5
SO BUILDWID SRC3 50.74 16.54 16.6 16.54 16.54 54.23
SO BUILDWID SRC3 53.87 51.87 48.5 51.98 53.89 54.15
SO BUILDWID SRC3 52.77 49.79 45.29 39.42 55.53 49.7
SO BUILDWID SRC3 50.74 39.82 45.63 50.04 52.94 54.23
SO BUILDWID SRC3 53.87 51.87 48.5 51.98 53.89 54.15
SO BUILDWID SRC3 52.77 49.79 45.29 39.42 55.53 49.7
SO BUILDLEN SRC3 53.34 16.54 16.6 16.54 16.54 45.29
SO BUILDLEN SRC3 39.42 32.35 24.8 32.81 39.82 45.63
SO BUILDLEN SRC3 50.04 52.94 54.23 53.87 51.87 48.5
SO BUILDLEN SRC3 53.34 53.89 54.15 52.77 49.79 45.29
SO BUILDLEN SRC3 39.42 32.35 24.8 32.81 39.82 45.63
SO BUILDLEN SRC3 50.04 52.94 54.23 53.87 51.87 48.5
SO XBADJ SRC3 -52.08 -54.96 -56.45 -56.41 -54.94 -34.15
SO XBADJ SRC3 -27.11 -19.25 -11.1 -10.74 -10.05 -9.06
SO XBADJ SRC3 -7.8 -6.29 -4.6 -2.76 -0.84 1.1
SO XBADJ SRC3 -1.26 -3.58 -5.8 -7.83 -9.63 -11.14
SO XBADJ SRC3 -12.31 -13.1 -13.7 -22.07 -29.77 -36.56
SO XBADJ SRC3 -42.25 -46.65 -49.63 -51.11 -51.03 -49.6
SO YBADJ SRC3 3.3 12.49 4.19 -4.23 -12.53 -22.52
SO YBADJ SRC3 -24.17 -25.09 -25.35 -24.73 -23.36 -21.28
SO YBADJ SRC3 -18.55 -15.26 -11.51 -7.4 -14.66 -11.15
SO YBADJ SRC3 -3.3 9.86 13.75 17.23 20.18 22.52
SO YBADJ SRC3 24.17 25.09 25.35 24.73 23.36 21.28
SO YBADJ SRC3 18.55 15.26 11.51 7.4 14.66 11.15
SO BUILDHGT SRC4 65.3 65.3 65.3 19.7 19.7 19.7
SO BUILDHGT SRC4 19.7 19.5 19.5 23.2 23.2 23.2
SO BUILDHGT SRC4 23.2 23.2 33.5 33.5 33.5 33.5
SO BUILDHGT SRC4 33.5 33.5 33.5 19.7 19.7 19.7
SO BUILDHGT SRC4 19.7 19.5 19.5 23.2 23.2 23.2
SO BUILDHGT SRC4 23.2 23.2 33.5 33.5 33.5 33.5
SO BUILDWID SRC4 16.54 16.54 16.56 40.71 44.52 46.98
SO BUILDWID SRC4 48.01 26.31 28.2 100.16 147.68 190.7
SO BUILDWID SRC4 227.94 258.25 45.29 39.42 55.53 49.7
SO BUILDWID SRC4 50.74 39.82 45.63 40.71 44.52 46.98
SO BUILDWID SRC4 48.01 26.31 28.2 100.16 147.68 190.7
SO BUILDWID SRC4 227.94 258.25 45.29 39.42 55.53 49.7
SO BUILDLEN SRC4 16.54 16.54 16.6 44.52 40.71 35.67
SO BUILDLEN SRC4 29.54 56.31 60.6 300.39 295.06 280.76
SO BUILDLEN SRC4 257.93 227.27 54.23 53.87 51.87 48.5
SO BUILDLEN SRC4 53.34 53.89 54.15 44.52 40.71 35.67
SO BUILDLEN SRC4 29.54 56.31 60.6 300.39 295.06 280.76
SO BUILDLEN SRC4 257.93 227.27 54.23 53.87 51.87 48.5
SO XBADJ SRC4 -97.58 -99.08 -97.85 -78.7 -75.42 -69.85
SO XBADJ SRC4 -62.16 -48.56 -54.0 16.66 24.11 30.83
SO XBADJ SRC4 36.62 41.29 32.81 38.63 43.27 46.6
SO XBADJ SRC4 44.24 40.54 35.61 34.18 34.71 34.19
SO XBADJ SRC4 32.62 -7.75 -6.6 -317.05 -319.17 -311.6
SO XBADJ SRC4 -294.55 -268.56 -87.04 -92.49 -95.14 -95.1
SO YBADJ SRC4 16.44 0.68 -15.1 -2.98 -12.73 -22.1
SO YBADJ SRC4 -30.8 14.37 3.7 -41.93 -12.28 17.74
SO YBADJ SRC4 47.23 75.27 -37.72 -26.72 -26.5 -15.15
SO YBADJ SRC4 0.66 21.66 33.04 2.98 12.73 22.1
SO YBADJ SRC4 30.8 -14.37 -3.7 41.93 12.28 -17.74
SO YBADJ SRC4 -47.23 -75.27 37.72 26.72 26.5 15.15
SO BUILDHGT SRC5 65.3 65.3 65.3 19.7 19.7 19.7
SO BUILDHGT SRC5 19.7 19.5 19.5 23.2 23.2 23.2
SO BUILDHGT SRC5 23.2 23.2 33.5 33.5 33.5 33.5
SO BUILDHGT SRC5 33.5 33.5 33.5 19.7 19.7 19.7
SO BUILDHGT SRC5 19.7 19.5 19.5 23.2 23.2 23.2
SO BUILDHGT SRC5 23.2 23.2 33.5 33.5 33.5 33.5
SO BUILDWID SRC5 16.54 16.54 16.56 40.71 44.52 46.98

FINAL

SO BUILDWID SRC5 48.01 26.31 28.2 100.16 147.68 190.7
SO BUILDWID SRC5 227.94 258.25 45.29 39.42 55.53 49.7
SO BUILDWID SRC5 50.74 39.82 45.63 40.71 44.52 46.98
SO BUILDWID SRC5 48.01 26.31 28.2 100.16 147.68 190.7
SO BUILDWID SRC5 227.94 258.25 45.29 39.42 55.53 49.7
SO BUILDLEN SRC5 16.54 16.54 16.6 44.52 40.71 35.67
SO BUILDLEN SRC5 29.54 56.31 60.6 300.39 295.06 280.76
SO BUILDLEN SRC5 257.93 227.27 54.23 53.87 51.87 48.5
SO BUILDLEN SRC5 53.34 53.89 54.15 44.52 40.71 35.67
SO BUILDLEN SRC5 29.54 56.31 60.6 300.39 295.06 280.76
SO BUILDLEN SRC5 257.93 227.27 54.23 53.87 51.87 48.5
SO XBADJ SRC5 -97.58 -99.08 -97.85 -78.7 -75.42 -69.85
SO XBADJ SRC5 -62.16 -48.56 -54.0 16.66 24.11 30.83
SO XBADJ SRC5 36.62 41.29 32.81 38.63 43.27 46.6
SO XBADJ SRC5 44.24 40.54 35.61 34.18 34.71 34.19
SO XBADJ SRC5 32.62 -7.75 -6.6 -317.05 -319.17 -311.6
SO XBADJ SRC5 -294.55 -268.56 -87.04 -92.49 -95.14 -95.1
SO YBADJ SRC5 16.44 0.68 -15.1 -2.98 -12.73 -22.1
SO YBADJ SRC5 -30.8 14.37 3.7 -41.93 -12.28 17.74
SO YBADJ SRC5 47.23 75.27 -37.72 -26.72 -26.5 -15.15
SO YBADJ SRC5 0.66 21.66 33.04 2.98 12.73 22.1
SO YBADJ SRC5 30.8 -14.37 -3.7 41.93 12.28 -17.74
SO YBADJ SRC5 -47.23 -75.27 37.72 26.72 26.5 15.15
SO BUILDHGT SRC6 23.5 23.5 18.0 18.0 18.0 18.0
SO BUILDHGT SRC6 18.0 18.0 18.0 12.0 12.0 12.0
SO BUILDHGT SRC6 12.0 12.0 23.5 23.5 23.5 18.0
SO BUILDHGT SRC6 23.5 23.5 18.0 18.0 18.0 18.0
SO BUILDHGT SRC6 18.0 18.0 18.0 12.0 12.0 12.0
SO BUILDHGT SRC6 12.0 12.0 23.5 23.5 23.5 18.0
SO BUILDWID SRC6 14.85 15.5 18.04 18.88 19.15 18.84
SO BUILDWID SRC6 26.6 26.95 26.55 117.59 113.51 105.98
SO BUILDWID SRC6 95.23 81.58 15.5 15.5 14.85 51.6
SO BUILDWID SRC6 14.85 15.5 18.04 18.88 19.15 18.84
SO BUILDWID SRC6 26.6 26.95 26.55 117.59 113.51 105.98
SO BUILDWID SRC6 95.23 81.58 15.5 15.5 14.85 51.6
SO BUILDLEN SRC6 15.5 17.03 18.84 19.15 18.88 18.04
SO BUILDLEN SRC6 17.72 14.75 12.4 27.8 47.35 65.46
SO BUILDLEN SRC6 81.58 95.23 18.04 17.03 15.5 85.0
SO BUILDLEN SRC6 15.5 17.03 18.84 19.15 18.88 18.04
SO BUILDLEN SRC6 17.72 14.75 12.4 27.8 47.35 65.46
SO BUILDLEN SRC6 81.58 95.23 18.04 17.03 15.5 85.0
SO XBADJ SRC6 -42.93 -41.95 -46.16 -47.57 -47.53 -46.05
SO XBADJ SRC6 -43.17 -38.98 -33.6 -23.63 -26.93 -29.42
SO XBADJ SRC6 -31.02 -31.67 22.4 25.43 27.69 29.1
SO XBADJ SRC6 27.42 24.92 27.31 28.41 28.65 28.01
SO XBADJ SRC6 25.45 24.23 21.2 -4.17 -20.41 -36.03
SO XBADJ SRC6 -50.56 -63.55 -40.44 -42.46 -43.19 -114.1
SO YBADJ SRC6 -6.96 -12.97 10.43 3.89 -2.76 -9.34
SO YBADJ SRC6 -11.31 -16.23 -20.62 -36.39 -37.53 -37.52
SO YBADJ SRC6 -36.38 -34.13 -17.28 -11.56 -5.49 -16.6
SO YBADJ SRC6 6.96 12.97 -10.43 -3.89 2.76 9.34
SO YBADJ SRC6 11.31 16.23 20.63 36.39 37.53 37.52
SO YBADJ SRC6 36.38 34.13 17.28 11.56 5.49 16.6
SO BUILDHGT SRC7 23.5 18.0 18.0 18.0 18.0 18.0
SO BUILDHGT SRC7 12.0 12.0 12.0 12.0 12.0 12.0
SO BUILDHGT SRC7 12.0 12.0 0.0 10.0 12.0 12.0
SO BUILDHGT SRC7 12.0 18.0 18.0 18.0 18.0 18.0
SO BUILDHGT SRC7 12.0 12.0 12.0 12.0 12.0 12.0
SO BUILDHGT SRC7 12.0 12.0 0.0 10.0 23.5 18.0
SO BUILDWID SRC7 14.61 45.79 18.04 18.88 19.15 25.49
SO BUILDWID SRC7 113.51 117.59 118.1 117.59 113.51 105.98
SO BUILDWID SRC7 95.23 81.58 0.0 125.2 37.43 28.8
SO BUILDWID SRC7 27.8 46.21 18.1 21.17 23.66 25.49
SO BUILDWID SRC7 113.51 117.59 118.1 117.59 113.51 105.98
SO BUILDWID SRC7 95.23 81.58 0.0 125.2 14.61 51.6
SO BUILDLEN SRC7 15.5 96.8 18.84 19.15 18.88 21.04
SO BUILDLEN SRC7 47.35 27.8 7.4 27.8 47.35 65.46
SO BUILDLEN SRC7 81.58 95.23 0.0 151.12 117.59 118.1
SO BUILDLEN SRC7 117.59 27.76 27.19 25.84 23.77 21.04
SO BUILDLEN SRC7 47.35 27.8 7.4 27.8 47.35 65.46
SO BUILDLEN SRC7 81.58 95.23 0.0 151.12 15.5 85.0
SO XBADJ SRC7 -56.92 -135.29 -58.88 -59.06 -57.45 -54.09
SO XBADJ SRC7 -56.21 -39.1 -20.8 -22.38 -23.27 -23.46
SO XBADJ SRC7 -22.94 -21.72 0.0 -17.36 -14.35 -10.9
SO XBADJ SRC7 -8.41 29.15 31.69 33.22 33.67 33.05
SO XBADJ SRC7 8.86 11.3 13.4 -5.42 -24.07 -42.0
SO XBADJ SRC7 -58.64 -73.51 0.0 -133.76 -56.76 -128.1
SO YBADJ SRC7 -8.21 -18.48 4.47 -4.19 -12.72 -17.54
SO YBADJ SRC7 -39.4 -44.45 -48.15 -50.39 -51.09 -50.25
SO YBADJ SRC7 -47.88 -44.05 0.0 -66.07 -20.39 -6.4
SO YBADJ SRC7 -8.48 1.8 -4.5 3.05 10.47 17.54
SO YBADJ SRC7 39.4 44.45 48.15 50.39 51.09 50.25

SO YBADJ SRC7 47.88 44.05 0.0 66.07 9.1 17.8
SO BUILDHGT SRC8 23.5 23.5 23.5 23.5 18.0 18.0
SO BUILDHGT SRC8 18.0 18.0 12.0 12.0 12.0 12.0
SO BUILDHGT SRC8 12.0 0.0 0.0 0.0 10.0 12.0
SO BUILDHGT SRC8 12.0 18.0 23.5 23.5 18.0 18.0
SO BUILDHGT SRC8 18.0 18.0 12.0 12.0 12.0 12.0
SO BUILDHGT SRC8 12.0 0.0 0.0 0.0 10.0 18.0
SO BUILDWID SRC8 14.85 16.55 17.5 17.5 19.15
18.84
SO BUILDWID SRC8 26.6 26.95 118.1 117.59 113.51
105.98
SO BUILDWID SRC8 95.23 0.0 0.0 0.0 128.4 28.8
SO BUILDWID SRC8 47.45 46.21 17.5 17.5 48.51
47.17
SO BUILDWID SRC8 44.45 40.43 118.1 117.59
113.51 105.98
SO BUILDWID SRC8 95.23 0.0 0.0 0.0 128.4 51.6
SO BUILDLEN SRC8 15.5 17.03 18.04 18.51 18.88
18.04
SO BUILDLEN SRC8 17.72 14.75 7.4 27.8 47.35
65.46
SO BUILDLEN SRC8 81.58 0.0 0.0 0.0 149.23 118.1
SO BUILDLEN SRC8 117.59 27.76 18.04 18.51 34.26
37.65
SO BUILDLEN SRC8 39.89 40.92 28.8 27.8 47.35
65.46
SO BUILDLEN SRC8 81.58 0.0 0.0 0.0 149.23 85.0
SO XBADJ SRC8 -52.34 -53.3 -52.63 -50.36 -62.42
-61.25
SO XBADJ SRC8 -58.22 -53.42 -33.0 -35.57 -37.06
-37.43
SO XBADJ SRC8 -36.66 0.0 0.0 0.0 -23.16 -17.7
SO XBADJ SRC8 -12.99 26.94 34.59 31.86 28.16
23.61
SO XBADJ SRC8 18.34 12.51 4.2 7.78 -10.28 -
28.03
SO XBADJ SRC8 -44.93 0.0 0.0 0.0 -126.06 -121.3
SO YBADJ SRC8 4.98 -2.84 -10.57 -17.98 0.33 -
8.87
SO YBADJ SRC8 -13.49 -20.99 -41.35 -45.81 -48.88
-50.46
SO YBADJ SRC8 -50.51 0.0 0.0 0.0 -62.22 -18.6
SO YBADJ SRC8 -11.85 -11.99 10.57 17.98 9.84
16.39
SO YBADJ SRC8 22.42 27.73 41.35 45.81 48.88
50.46
SO YBADJ SRC8 50.51 0.0 0.0 0.0 62.22 30.0
SO BUILDHGT SRC9 33.5 33.5 19.7 19.5 19.5 19.5
SO BUILDHGT SRC9 19.5 19.5 19.4 19.5 30.0 30.0
SO BUILDHGT SRC9 37.0 37.0 37.0 19.5 19.5 19.5
SO BUILDHGT SRC9 19.5 19.7 19.7 19.5 19.5 19.5
SO BUILDHGT SRC9 19.5 19.5 19.4 19.5 23.2 23.2
SO BUILDHGT SRC9 23.2 23.2 23.2 23.2 33.5 33.5
SO BUILDWID SRC9 50.74 50.53 35.67 46.15 40.02
32.48
SO BUILDWID SRC9 23.95 21.05 27.0 23.44 106.06
30.0
SO BUILDWID SRC9 49.82 49.82 50.0 54.61 56.31
56.3
SO BUILDWID SRC9 56.31 350.45 336.3 46.34 40.02
32.48
SO BUILDWID SRC9 23.95 21.05 27.0 23.44 147.68
190.7
SO BUILDWID SRC9 227.94 258.25 280.71 294.64
55.53 49.7
SO BUILDLEN SRC9 53.34 58.54 46.98 40.02 46.34
51.26
SO BUILDLEN SRC9 54.61 56.31 56.3 56.31 52.67
30.0
SO BUILDLEN SRC9 49.82 49.82 50.0 23.95 14.7 5.0
SO BUILDLEN SRC9 14.7 207.59 255.15 40.02 46.34
51.26
SO BUILDLEN SRC9 54.61 56.31 56.3 56.31 295.06
280.76
SO BUILDLEN SRC9 257.93 227.27 189.7 146.36
51.87 48.5
SO XBADJ SRC9 -163.47 -162.25 -138.12 -82.37 -
29.53 -34.15
SO XBADJ SRC9 -37.74 -40.18 -41.4 -42.23 -174.88
-151.18
SO XBADJ SRC9 -190.66 -191.08 -186.54 -22.05 -
15.46 -8.4
SO XBADJ SRC9 -10.86 1.6 -54.57 -16.01 -16.81 -
17.1
SO XBADJ SRC9 -16.87 -16.13 -14.9 -14.08 -340.36
-343.43
SO XBADJ SRC9 -336.06 -318.48 -291.23 -255.13 -
160.44 -161.7
SO YBADJ SRC9 -10.55 -37.49 -24.96 -21.95 13.04
11.73
SO YBADJ SRC9 10.08 4.94 4.9 -0.86 44.46 -17.54
SO YBADJ SRC9 16.91 -12.12 -40.8 -10.43 -12.02 -
13.25
SO YBADJ SRC9 -14.07 165.13 175.27 -13.94 -
13.04 -11.73
SO YBADJ SRC9 -10.08 -4.94 -4.9 0.86 75.44 40.78
SO YBADJ SRC9 4.89 -31.16 -66.26 -99.35 39.74
16.85
SO BUILDHGT SRC10 33.5 33.5 19.7 19.5 19.5 19.5
SO BUILDHGT SRC10 19.5 19.5 19.4 19.5 30.0 30.0
SO BUILDHGT SRC10 37.0 37.0 37.0 19.5 19.5 19.5
SO BUILDHGT SRC10 19.5 19.7 19.7 19.5 19.5 19.5
SO BUILDHGT SRC10 19.5 19.5 19.4 19.5 23.2 23.2
SO BUILDHGT SRC10 23.2 23.2 23.2 23.2 33.5 33.5
SO BUILDWID SRC10 50.74 50.53 35.67 46.15 40.02
32.48
SO BUILDWID SRC10 23.95 21.05 27.0 23.44 106.06
30.0
SO BUILDWID SRC10 49.82 49.82 50.0 54.61 56.31
56.3
SO BUILDWID SRC10 56.31 350.45 336.3 46.34
40.02 32.48
SO BUILDWID SRC10 23.95 21.05 27.0 23.44 147.68
190.7
SO BUILDWID SRC10 227.94 258.25 280.71 294.64
55.53 49.7
SO BUILDLEN SRC10 53.34 58.54 46.98 40.02 46.34
51.26
SO BUILDLEN SRC10 54.61 56.31 56.3 56.31 52.67
30.0
SO BUILDLEN SRC10 49.82 49.82 50.0 23.95 14.7
5.0
SO BUILDLEN SRC10 14.7 207.59 255.15 40.02
46.34 51.26
SO BUILDLEN SRC10 54.61 56.31 56.3 56.31 295.06
280.76
SO BUILDLEN SRC10 257.93 227.27 189.7 146.36
51.87 48.5
SO XBADJ SRC10 -163.47 -162.25 -138.12 -82.37 -
29.53 -34.15
SO XBADJ SRC10 -37.74 -40.18 -41.4 -42.23 -
174.88 -151.18
SO XBADJ SRC10 -190.66 -191.08 -186.54 -22.05 -
15.46 -8.4
SO XBADJ SRC10 -10.86 1.6 -54.57 -16.01 -16.81 -
17.1
SO XBADJ SRC10 -16.87 -16.13 -14.9 -14.08 -
340.36 -343.43
SO XBADJ SRC10 -336.06 -318.48 -291.23 -255.13
-160.44 -161.7
SO YBADJ SRC10 -10.55 -37.49 -24.96 -21.95
13.04 11.73
SO YBADJ SRC10 10.08 4.94 4.9 -0.86 44.46 -
17.54

SO YBADJ SRC10 16.91 -12.12 -40.8 -10.43 -12.02 -13.25
SO YBADJ SRC10 -14.07 165.13 175.27 -13.94 -13.04 -11.73
SO YBADJ SRC10 -10.08 -4.94 -4.9 0.86 75.44 40.78
SO YBADJ SRC10 4.89 -31.16 -66.26 -99.35 39.74 16.85
SO BUILDHGT SRC11 33.5 33.5 19.7 19.5 19.5 19.5
SO BUILDHGT SRC11 19.5 19.5 19.4 19.5 30.0 30.0
SO BUILDHGT SRC11 37.0 37.0 37.0 19.5 19.5 19.5
SO BUILDHGT SRC11 19.5 19.7 19.7 19.5 19.5 19.5
SO BUILDHGT SRC11 19.5 19.5 19.4 19.5 23.2 23.2
SO BUILDHGT SRC11 23.2 23.2 23.2 23.2 33.5 33.5
SO BUILDWID SRC11 50.74 50.53 35.67 46.15 40.02 32.48
SO BUILDWID SRC11 23.95 21.05 27.0 23.44 106.06 30.0
SO BUILDWID SRC11 49.82 49.82 50.0 54.61 56.31 56.3
SO BUILDWID SRC11 56.31 350.45 336.3 46.34 40.02 32.48
SO BUILDWID SRC11 23.95 21.05 27.0 23.44 147.68 190.7
SO BUILDWID SRC11 227.94 258.25 280.71 294.64 55.53 49.7
SO BUILDLEN SRC11 53.34 58.54 46.98 40.02 46.34 51.26
SO BUILDLEN SRC11 54.61 56.31 56.3 56.31 52.67 30.0
SO BUILDLEN SRC11 49.82 49.82 50.0 23.95 14.7 5.0
SO BUILDLEN SRC11 14.7 207.59 255.15 40.02 46.34 51.26
SO BUILDLEN SRC11 54.61 56.31 56.3 56.31 295.06 280.76
SO BUILDLEN SRC11 257.93 227.27 189.7 146.36 51.87 48.5
SO XBADJ SRC11 -163.47 -162.25 -138.12 -82.37 -29.53 -34.15
SO XBADJ SRC11 -37.74 -40.18 -41.4 -42.23 -174.88 -151.18
SO XBADJ SRC11 -190.66 -191.08 -186.54 -22.05 -15.46 -8.4
SO XBADJ SRC11 -10.86 1.6 -54.57 -16.01 -16.81 -17.1
SO XBADJ SRC11 -16.87 -16.13 -14.9 -14.08 -340.36 -343.43
SO XBADJ SRC11 -336.06 -318.48 -291.23 -255.13 -160.44 -161.7
SO YBADJ SRC11 -10.55 -37.49 -24.96 -21.95 13.04 11.73
SO YBADJ SRC11 10.08 4.94 4.9 -0.86 44.46 -17.54
SO YBADJ SRC11 16.91 -12.12 -40.8 -10.43 -12.02 -13.25
SO YBADJ SRC11 -14.07 165.13 175.27 -13.94 -13.04 -11.73
SO YBADJ SRC11 -10.08 -4.94 -4.9 0.86 75.44 40.78
SO YBADJ SRC11 4.89 -31.16 -66.26 -99.35 39.74 16.85
SO BUILDHGT SRC12 19.5 19.5 19.5 19.5 19.5 30.0
SO BUILDHGT SRC12 30.0 37.0 37.0 37.0 37.0 19.5
SO BUILDHGT SRC12 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDHGT SRC12 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDHGT SRC12 19.5 19.5 19.4 19.5 19.5 19.5
SO BUILDHGT SRC12 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDWID SRC12 56.02 54.33 51.0 46.11 39.83 30.0
SO BUILDWID SRC12 98.81 49.81 50.0 49.81 49.81 32.33
SO BUILDWID SRC12 39.83 46.11 51.0 54.33 56.02 56.0
SO BUILDWID SRC12 56.02 54.33 51.0 46.11 39.83 32.33
SO BUILDWID SRC12 23.85 20.61 28.0 23.22 23.85 32.33
SO BUILDWID SRC12 39.83 46.11 51.0 54.33 56.02 56.0
SO BUILDLEN SRC12 14.65 23.85 32.33 39.83 46.11 30.0
SO BUILDLEN SRC12 72.59 49.81 50.0 49.81 49.81 51.0
SO BUILDLEN SRC12 46.11 39.83 32.33 23.85 14.65 5.0
SO BUILDLEN SRC12 14.65 23.85 32.33 39.83 46.11 51.0
SO BUILDLEN SRC12 54.33 56.02 56.0 56.02 54.33 51.0
SO BUILDLEN SRC12 46.11 39.83 32.33 23.85 14.65 5.0
SO XBADJ SRC12 -10.7 -11.78 -12.5 -12.85 -12.8 -158.56
SO XBADJ SRC12 -159.51 -144.08 -147.9 -147.8 -144.05 -5.56
SO XBADJ SRC12 -4.05 -2.43 -0.73 1.0 2.69 4.3
SO XBADJ SRC12 -3.94 -12.07 -19.83 -26.98 -33.32 -38.64
SO XBADJ SRC12 -42.79 -45.64 -47.1 -48.0 -47.44 -45.44
SO XBADJ SRC12 -42.06 -37.4 -31.6 -24.85 -17.34 -9.3
SO YBADJ SRC12 -19.99 -20.27 -19.94 -19.0 -17.49 18.34
SO YBADJ SRC12 27.59 31.88 10.7 -10.8 -31.98 3.66
SO YBADJ SRC12 7.07 10.26 13.14 15.62 17.63 19.1
SO YBADJ SRC12 19.99 20.27 19.94 19.0 17.49 15.44
SO YBADJ SRC12 12.92 7.03 6.6 -0.91 -0.14 -3.66
SO YBADJ SRC12 -7.07 -10.26 -13.14 -15.62 -17.63 -19.1
SO BUILDHGT SRC13 19.5 19.5 19.5 19.5 19.5 30.0
SO BUILDHGT SRC13 30.0 37.0 37.0 37.0 37.0 19.5
SO BUILDHGT SRC13 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDHGT SRC13 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDHGT SRC13 19.5 19.5 19.4 19.5 19.5 19.5
SO BUILDHGT SRC13 19.5 19.5 19.5 19.5 19.5 19.5
SO BUILDWID SRC13 56.02 54.33 51.0 46.11 39.83 30.0
SO BUILDWID SRC13 98.81 49.81 50.0 49.81 49.81 32.33
SO BUILDWID SRC13 39.83 46.11 51.0 54.33 56.02 56.0
SO BUILDWID SRC13 56.02 54.33 51.0 46.11 39.83 32.33
SO BUILDWID SRC13 23.85 20.61 28.0 23.22 23.85 32.33
SO BUILDWID SRC13 39.83 46.11 51.0 54.33 56.02 56.0
SO BUILDLEN SRC13 14.65 23.85 32.33 39.83 46.11 30.0
SO BUILDLEN SRC13 72.59 49.81 50.0 49.81 49.81 51.0
SO BUILDLEN SRC13 46.11 39.83 32.33 23.85 14.65 5.0
SO BUILDLEN SRC13 14.65 23.85 32.33 39.83 46.11 51.0
SO BUILDLEN SRC13 54.33 56.02 56.0 56.02 54.33 51.0
SO BUILDLEN SRC13 46.11 39.83 32.33 23.85 14.65 5.0

SO XBADJ SRC13 -10.7 -11.78 -12.5 -12.85 -12.8 -158.56
SO XBADJ SRC13 -159.51 -144.08 -147.9 -147.8 -144.05 -5.56
SO XBADJ SRC13 -4.05 -2.43 -0.73 1.0 2.69 4.3
SO XBADJ SRC13 -3.94 -12.07 -19.83 -26.98 -33.32 -38.64
SO XBADJ SRC13 -42.79 -45.64 -47.1 -48.0 -47.44 -45.44
SO XBADJ SRC13 -42.06 -37.4 -31.6 -24.85 -17.34 -9.3
SO YBADJ SRC13 -19.99 -20.27 -19.94 -19.0 -17.49 18.34
SO YBADJ SRC13 27.59 31.88 10.7 -10.8 -31.98 3.66
SO YBADJ SRC13 7.07 10.26 13.14 15.62 17.63 19.1
SO YBADJ SRC13 19.99 20.27 19.94 19.0 17.49 15.44
SO YBADJ SRC13 12.92 7.03 6.6 -0.91 -0.14 -3.66
SO YBADJ SRC13 -7.07 -10.26 -13.14 -15.62 -17.63 -19.1
SO BUILDHGT SRC14 55.0 55.0 55.0 55.0 55.0 62.0
SO BUILDHGT SRC14 62.0 62.0 62.0 62.0 62.0 62.0
SO BUILDHGT SRC14 55.0 55.0 55.0 55.0 55.0 55.0
SO BUILDHGT SRC14 55.0 55.0 55.0 55.0 55.0 62.0
SO BUILDHGT SRC14 62.0 62.0 62.0 62.0 62.0 62.0
SO BUILDHGT SRC14 55.0 55.0 55.0 55.0 55.0 55.0
SO BUILDWID SRC14 20.34 21.26 21.53 21.15 20.13 14.34
SO BUILDWID SRC14 13.46 12.16 10.5 12.16 13.46 14.34
SO BUILDWID SRC14 19.74 20.83 21.28 21.09 20.25 18.8
SO BUILDWID SRC14 20.34 21.26 21.53 21.15 20.13 14.34
SO BUILDWID SRC14 13.46 12.16 10.5 12.16 13.46 14.34
SO BUILDWID SRC14 19.74 20.83 21.28 21.09 20.25 18.8
SO BUILDLEN SRC14 13.11 15.83 18.06 19.74 20.83 14.34
SO BUILDLEN SRC14 13.46 12.16 10.5 12.16 13.46 14.34
SO BUILDLEN SRC14 21.15 20.13 18.49 16.3 13.61 10.5
SO BUILDLEN SRC14 13.11 15.83 18.06 19.74 20.83 14.34
SO BUILDLEN SRC14 13.46 12.16 10.5 12.16 13.46 14.34
SO BUILDLEN SRC14 21.15 20.13 18.49 16.3 13.61 10.5
SO XBADJ SRC14 -4.07 -6.62 -8.96 -11.04 -12.77 -14.12
SO XBADJ SRC14 -15.04 -15.51 -15.5 -16.84 -17.68 -17.97
SO XBADJ SRC14 -17.72 -16.93 -15.63 -13.85 -11.65 -9.1
SO XBADJ SRC14 -9.04 -9.21 -9.1 -8.71 -8.06 -0.22
SO XBADJ SRC14 1.59 3.34 5.0 4.68 4.22 3.63
SO XBADJ SRC14 -3.43 -3.19 -2.86 -2.44 -1.95 -1.4
SO YBADJ SRC14 6.68 7.05 7.21 7.15 6.87 8.46
SO YBADJ SRC14 7.12 5.57 3.85 2.01 0.11 -1.79
SO YBADJ SRC14 -1.16 -2.36 -3.48 -4.5 -5.38 -6.1
SO YBADJ SRC14 -6.68 -7.05 -7.21 -7.15 -6.87 -8.46
SO YBADJ SRC14 -7.12 -5.57 -3.85 -2.01 -0.11 1.79
SO YBADJ SRC14 1.16 2.36 3.48 4.5 5.38 6.1
SO EMISUNIT 1.0E+06 GRAMS/SEC MICROGRAMS/M**3
SO SRCGROUP PM10 SRC1 SRC2 SRC3 SRC14
SO SRCGROUP NH3 SRC2 SRC3 SRC14
SO SRCGROUP NOXNORM1 SRC4 SRC6 SRC8 SRC9 SRC12
SO SRCGROUP NOXNORM2 SRC4 SRC6 SRC7 SRC8 SRC9 SRC12
SO SRCGROUP NOXSTART SRC4 SRC6 SRC7 SRC8 SRC9 SRC10 SRC12
SO SRCGROUP NOXSHUT SRC5 SRC6 SRC7 SRC8 SRC11 SRC13
SO SRCGROUP ALL
SO SRCGROUP SCR1 SRC1
SO SRCGROUP SCR2 SRC2
SO SRCGROUP SCR3 SRC3
SO SRCGROUP SCR14 SRC14
SO FINISHED

RE STARTING
** ONSITGRD STA
** RE GRIDCART GRD1 STA 1
** ** GRDDESCR Large Grid
** RE GRIDCART GRD1 XYINC 382000.0 25 200.0 6429800.0 35 200.0
** RE GRIDCART GRD1 END
** ONSITGRD END
** OFFSTRCP GRD1
RE DISCCART 382000.0 6429800.0
RE DISCCART 382200.0 6429800.0
RE DISCCART 382400.0 6429800.0
RE DISCCART 382600.0 6429800.0
RE DISCCART 382800.0 6429800.0
RE DISCCART 383000.0 6429800.0
RE DISCCART 383200.0 6429800.0
RE DISCCART 383400.0 6429800.0
RE DISCCART 383600.0 6429800.0
RE DISCCART 383800.0 6429800.0
RE DISCCART 384000.0 6429800.0
RE DISCCART 384200.0 6429800.0
RE DISCCART 384400.0 6429800.0
RE DISCCART 384600.0 6429800.0
RE DISCCART 384800.0 6429800.0
RE DISCCART 385000.0 6429800.0
RE DISCCART 385200.0 6429800.0
RE DISCCART 385400.0 6429800.0
RE DISCCART 385600.0 6429800.0
RE DISCCART 385800.0 6429800.0
RE DISCCART 386000.0 6429800.0
RE DISCCART 386200.0 6429800.0
RE DISCCART 386400.0 6429800.0
RE DISCCART 386600.0 6429800.0
RE DISCCART 386800.0 6429800.0
RE DISCCART 382000.0 6430000.0
RE DISCCART 382200.0 6430000.0
RE DISCCART 382400.0 6430000.0
RE DISCCART 382600.0 6430000.0
RE DISCCART 382800.0 6430000.0
RE DISCCART 383000.0 6430000.0
RE DISCCART 383200.0 6430000.0
RE DISCCART 383400.0 6430000.0
RE DISCCART 383600.0 6430000.0
RE DISCCART 383800.0 6430000.0
RE DISCCART 384000.0 6430000.0
RE DISCCART 384200.0 6430000.0
RE DISCCART 384400.0 6430000.0
RE DISCCART 384600.0 6430000.0
RE DISCCART 384800.0 6430000.0
RE DISCCART 385000.0 6430000.0
RE DISCCART 385200.0 6430000.0
RE DISCCART 385400.0 6430000.0
RE DISCCART 385600.0 6430000.0
RE DISCCART 385800.0 6430000.0
RE DISCCART 386000.0 6430000.0
RE DISCCART 386200.0 6430000.0
RE DISCCART 386400.0 6430000.0
RE DISCCART 386600.0 6430000.0

FINAL

```
RE DISCCART  386800.0  6430000.0
RE DISCCART  382000.0  6430200.0
RE DISCCART  382200.0  6430200.0
RE DISCCART  382400.0  6430200.0
RE DISCCART  382600.0  6430200.0
RE DISCCART  382800.0  6430200.0
RE DISCCART  383000.0  6430200.0
RE DISCCART  383200.0  6430200.0
RE DISCCART  383400.0  6430200.0
RE DISCCART  383600.0  6430200.0
RE DISCCART  383800.0  6430200.0
RE DISCCART  384000.0  6430200.0
RE DISCCART  384200.0  6430200.0
RE DISCCART  384400.0  6430200.0
RE DISCCART  384600.0  6430200.0
RE DISCCART  384800.0  6430200.0
RE DISCCART  385000.0  6430200.0
RE DISCCART  385200.0  6430200.0
RE DISCCART  385400.0  6430200.0
RE DISCCART  385600.0  6430200.0
RE DISCCART  385800.0  6430200.0
RE DISCCART  386000.0  6430200.0
RE DISCCART  386200.0  6430200.0
RE DISCCART  386400.0  6430200.0
RE DISCCART  386600.0  6430200.0
RE DISCCART  386800.0  6430200.0
RE DISCCART  382000.0  6430400.0
RE DISCCART  382200.0  6430400.0
RE DISCCART  382400.0  6430400.0
RE DISCCART  382600.0  6430400.0
RE DISCCART  382800.0  6430400.0
RE DISCCART  383000.0  6430400.0
RE DISCCART  383200.0  6430400.0
RE DISCCART  383400.0  6430400.0
RE DISCCART  383600.0  6430400.0
RE DISCCART  383800.0  6430400.0
RE DISCCART  384000.0  6430400.0
RE DISCCART  384200.0  6430400.0
RE DISCCART  384400.0  6430400.0
RE DISCCART  384600.0  6430400.0
RE DISCCART  384800.0  6430400.0
RE DISCCART  385000.0  6430400.0
RE DISCCART  385200.0  6430400.0
RE DISCCART  385400.0  6430400.0
RE DISCCART  385600.0  6430400.0
RE DISCCART  385800.0  6430400.0
RE DISCCART  386000.0  6430400.0
RE DISCCART  386200.0  6430400.0
RE DISCCART  386400.0  6430400.0
RE DISCCART  386600.0  6430400.0
RE DISCCART  386800.0  6430400.0
RE DISCCART  382000.0  6430600.0
RE DISCCART  382200.0  6430600.0
RE DISCCART  382400.0  6430600.0
RE DISCCART  382600.0  6430600.0
RE DISCCART  382800.0  6430600.0
RE DISCCART  383000.0  6430600.0
RE DISCCART  383200.0  6430600.0
RE DISCCART  383400.0  6430600.0
RE DISCCART  383600.0  6430600.0
RE DISCCART  383800.0  6430600.0
RE DISCCART  384000.0  6430600.0
RE DISCCART  384200.0  6430600.0
RE DISCCART  384400.0  6430600.0
RE DISCCART  384600.0  6430600.0
RE DISCCART  384800.0  6430600.0
RE DISCCART  385000.0  6430600.0
RE DISCCART  385200.0  6430600.0
RE DISCCART  385400.0  6430600.0
RE DISCCART  385600.0  6430600.0
RE DISCCART  385800.0  6430600.0
RE DISCCART  386000.0  6430600.0
RE DISCCART  386200.0  6430600.0
RE DISCCART  386400.0  6430600.0
RE DISCCART  386600.0  6430600.0
RE DISCCART  386800.0  6430600.0
RE DISCCART  382000.0  6430800.0
RE DISCCART  382200.0  6430800.0
RE DISCCART  382400.0  6430800.0
RE DISCCART  382600.0  6430800.0
RE DISCCART  382800.0  6430800.0
RE DISCCART  383000.0  6430800.0
RE DISCCART  383200.0  6430800.0
RE DISCCART  383400.0  6430800.0
RE DISCCART  383600.0  6430800.0
RE DISCCART  383800.0  6430800.0
RE DISCCART  384000.0  6430800.0
RE DISCCART  384200.0  6430800.0
RE DISCCART  384400.0  6430800.0
RE DISCCART  384600.0  6430800.0
RE DISCCART  384800.0  6430800.0
RE DISCCART  385000.0  6430800.0
RE DISCCART  385200.0  6430800.0
RE DISCCART  385400.0  6430800.0
RE DISCCART  385600.0  6430800.0
RE DISCCART  385800.0  6430800.0
RE DISCCART  386000.0  6430800.0
RE DISCCART  386200.0  6430800.0
RE DISCCART  386400.0  6430800.0
RE DISCCART  386600.0  6430800.0
RE DISCCART  386800.0  6430800.0
RE DISCCART  382000.0  6431000.0
RE DISCCART  382200.0  6431000.0
RE DISCCART  382400.0  6431000.0
RE DISCCART  382600.0  6431000.0
RE DISCCART  382800.0  6431000.0
RE DISCCART  383000.0  6431000.0
RE DISCCART  383200.0  6431000.0
RE DISCCART  383400.0  6431000.0
RE DISCCART  383600.0  6431000.0
RE DISCCART  383800.0  6431000.0
RE DISCCART  384000.0  6431000.0
RE DISCCART  384200.0  6431000.0
RE DISCCART  384400.0  6431000.0
RE DISCCART  384600.0  6431000.0
RE DISCCART  384800.0  6431000.0
RE DISCCART  385000.0  6431000.0
RE DISCCART  385200.0  6431000.0
RE DISCCART  385400.0  6431000.0
RE DISCCART  385600.0  6431000.0
RE DISCCART  385800.0  6431000.0
RE DISCCART  386000.0  6431000.0
RE DISCCART  386200.0  6431000.0
RE DISCCART  386400.0  6431000.0
RE DISCCART  386600.0  6431000.0
RE DISCCART  386800.0  6431000.0
RE DISCCART  382000.0  6431200.0
RE DISCCART  382200.0  6431200.0
RE DISCCART  382400.0  6431200.0
RE DISCCART  382600.0  6431200.0
RE DISCCART  382800.0  6431200.0
RE DISCCART  383000.0  6431200.0
RE DISCCART  383200.0  6431200.0
RE DISCCART  383400.0  6431200.0
RE DISCCART  383600.0  6431200.0
RE DISCCART  383800.0  6431200.0
RE DISCCART  384000.0  6431200.0
RE DISCCART  384200.0  6431200.0
RE DISCCART  384400.0  6431200.0
RE DISCCART  384600.0  6431200.0
RE DISCCART  384800.0  6431200.0
RE DISCCART  385000.0  6431200.0
RE DISCCART  385200.0  6431200.0
RE DISCCART  385400.0  6431200.0
RE DISCCART  385600.0  6431200.0
RE DISCCART  385800.0  6431200.0
```

RE DISCCART 386000.0 6431200.0
RE DISCCART 386200.0 6431200.0
RE DISCCART 386400.0 6431200.0
RE DISCCART 386600.0 6431200.0
RE DISCCART 386800.0 6431200.0
RE DISCCART 382000.0 6431400.0
RE DISCCART 382200.0 6431400.0
RE DISCCART 382400.0 6431400.0
RE DISCCART 382600.0 6431400.0
RE DISCCART 382800.0 6431400.0
RE DISCCART 383000.0 6431400.0
RE DISCCART 383200.0 6431400.0
RE DISCCART 383400.0 6431400.0
RE DISCCART 383600.0 6431400.0
RE DISCCART 383800.0 6431400.0
RE DISCCART 384000.0 6431400.0
RE DISCCART 384200.0 6431400.0
RE DISCCART 384400.0 6431400.0
RE DISCCART 384600.0 6431400.0
RE DISCCART 384800.0 6431400.0
RE DISCCART 385000.0 6431400.0
RE DISCCART 385200.0 6431400.0
RE DISCCART 385400.0 6431400.0
RE DISCCART 385600.0 6431400.0
RE DISCCART 385800.0 6431400.0
RE DISCCART 386000.0 6431400.0
RE DISCCART 386200.0 6431400.0
RE DISCCART 386400.0 6431400.0
RE DISCCART 386600.0 6431400.0
RE DISCCART 386800.0 6431400.0
RE DISCCART 382000.0 6431600.0
RE DISCCART 382200.0 6431600.0
RE DISCCART 382400.0 6431600.0
RE DISCCART 382600.0 6431600.0
RE DISCCART 382800.0 6431600.0
RE DISCCART 383000.0 6431600.0
RE DISCCART 383200.0 6431600.0
RE DISCCART 383400.0 6431600.0
RE DISCCART 383600.0 6431600.0
RE DISCCART 383800.0 6431600.0
RE DISCCART 384000.0 6431600.0
RE DISCCART 384200.0 6431600.0
RE DISCCART 384400.0 6431600.0
RE DISCCART 384600.0 6431600.0
RE DISCCART 384800.0 6431600.0
RE DISCCART 385000.0 6431600.0
RE DISCCART 385200.0 6431600.0
RE DISCCART 385400.0 6431600.0
RE DISCCART 385600.0 6431600.0
RE DISCCART 385800.0 6431600.0
RE DISCCART 386000.0 6431600.0
RE DISCCART 386200.0 6431600.0
RE DISCCART 386400.0 6431600.0
RE DISCCART 386600.0 6431600.0
RE DISCCART 386800.0 6431600.0
RE DISCCART 382000.0 6431800.0
RE DISCCART 382200.0 6431800.0
RE DISCCART 382400.0 6431800.0
RE DISCCART 382600.0 6431800.0
RE DISCCART 382800.0 6431800.0
RE DISCCART 383000.0 6431800.0
RE DISCCART 383200.0 6431800.0
RE DISCCART 383400.0 6431800.0
RE DISCCART 383600.0 6431800.0
RE DISCCART 383800.0 6431800.0
RE DISCCART 384000.0 6431800.0
RE DISCCART 384200.0 6431800.0
RE DISCCART 384400.0 6431800.0
RE DISCCART 384600.0 6431800.0
RE DISCCART 384800.0 6431800.0
RE DISCCART 385000.0 6431800.0
RE DISCCART 385200.0 6431800.0
RE DISCCART 385400.0 6431800.0
RE DISCCART 385600.0 6431800.0
RE DISCCART 385800.0 6431800.0
RE DISCCART 386000.0 6431800.0
RE DISCCART 386200.0 6431800.0
RE DISCCART 386400.0 6431800.0
RE DISCCART 386600.0 6431800.0
RE DISCCART 386800.0 6431800.0
RE DISCCART 382000.0 6432000.0
RE DISCCART 382200.0 6432000.0
RE DISCCART 382400.0 6432000.0
RE DISCCART 382600.0 6432000.0
RE DISCCART 382800.0 6432000.0
RE DISCCART 383000.0 6432000.0
RE DISCCART 383200.0 6432000.0
RE DISCCART 383400.0 6432000.0
RE DISCCART 384600.0 6432000.0
RE DISCCART 384800.0 6432000.0
RE DISCCART 385000.0 6432000.0
RE DISCCART 385200.0 6432000.0
RE DISCCART 385400.0 6432000.0
RE DISCCART 385600.0 6432000.0
RE DISCCART 385800.0 6432000.0
RE DISCCART 386000.0 6432000.0
RE DISCCART 386200.0 6432000.0
RE DISCCART 386400.0 6432000.0
RE DISCCART 386600.0 6432000.0
RE DISCCART 386800.0 6432000.0
RE DISCCART 382000.0 6432200.0
RE DISCCART 382200.0 6432200.0
RE DISCCART 382400.0 6432200.0
RE DISCCART 382600.0 6432200.0
RE DISCCART 382800.0 6432200.0
RE DISCCART 383000.0 6432200.0
RE DISCCART 384800.0 6432200.0
RE DISCCART 385000.0 6432200.0
RE DISCCART 385200.0 6432200.0
RE DISCCART 385400.0 6432200.0
RE DISCCART 385600.0 6432200.0
RE DISCCART 385800.0 6432200.0
RE DISCCART 386000.0 6432200.0
RE DISCCART 386200.0 6432200.0
RE DISCCART 386400.0 6432200.0
RE DISCCART 386600.0 6432200.0
RE DISCCART 386800.0 6432200.0
RE DISCCART 382000.0 6432400.0
RE DISCCART 382200.0 6432400.0
RE DISCCART 382400.0 6432400.0
RE DISCCART 382600.0 6432400.0
RE DISCCART 382800.0 6432400.0
RE DISCCART 383000.0 6432400.0
RE DISCCART 383200.0 6432400.0
RE DISCCART 384800.0 6432400.0
RE DISCCART 385000.0 6432400.0
RE DISCCART 385200.0 6432400.0
RE DISCCART 385400.0 6432400.0
RE DISCCART 385600.0 6432400.0
RE DISCCART 385800.0 6432400.0
RE DISCCART 386000.0 6432400.0
RE DISCCART 386200.0 6432400.0
RE DISCCART 386400.0 6432400.0
RE DISCCART 386600.0 6432400.0
RE DISCCART 386800.0 6432400.0
RE DISCCART 382000.0 6432600.0
RE DISCCART 382200.0 6432600.0
RE DISCCART 382400.0 6432600.0
RE DISCCART 382600.0 6432600.0
RE DISCCART 382800.0 6432600.0
RE DISCCART 383000.0 6432600.0
RE DISCCART 383200.0 6432600.0
RE DISCCART 384800.0 6432600.0
RE DISCCART 385000.0 6432600.0
RE DISCCART 385200.0 6432600.0
RE DISCCART 385400.0 6432600.0

FINAL

```
RE DISCCART  385600.0  6432600.0
RE DISCCART  385800.0  6432600.0
RE DISCCART  386000.0  6432600.0
RE DISCCART  386200.0  6432600.0
RE DISCCART  386400.0  6432600.0
RE DISCCART  386600.0  6432600.0
RE DISCCART  386800.0  6432600.0
RE DISCCART  382000.0  6432800.0
RE DISCCART  382200.0  6432800.0
RE DISCCART  382400.0  6432800.0
RE DISCCART  382600.0  6432800.0
RE DISCCART  382800.0  6432800.0
RE DISCCART  383000.0  6432800.0
RE DISCCART  383200.0  6432800.0
RE DISCCART  383400.0  6432800.0
RE DISCCART  383600.0  6432800.0
RE DISCCART  384800.0  6432800.0
RE DISCCART  385000.0  6432800.0
RE DISCCART  385200.0  6432800.0
RE DISCCART  385400.0  6432800.0
RE DISCCART  385600.0  6432800.0
RE DISCCART  385800.0  6432800.0
RE DISCCART  386000.0  6432800.0
RE DISCCART  386200.0  6432800.0
RE DISCCART  386400.0  6432800.0
RE DISCCART  386600.0  6432800.0
RE DISCCART  386800.0  6432800.0
RE DISCCART  382000.0  6433000.0
RE DISCCART  382200.0  6433000.0
RE DISCCART  382400.0  6433000.0
RE DISCCART  382600.0  6433000.0
RE DISCCART  382800.0  6433000.0
RE DISCCART  383000.0  6433000.0
RE DISCCART  383200.0  6433000.0
RE DISCCART  383400.0  6433000.0
RE DISCCART  383600.0  6433000.0
RE DISCCART  384800.0  6433000.0
RE DISCCART  385000.0  6433000.0
RE DISCCART  385200.0  6433000.0
RE DISCCART  385400.0  6433000.0
RE DISCCART  385600.0  6433000.0
RE DISCCART  385800.0  6433000.0
RE DISCCART  386000.0  6433000.0
RE DISCCART  386200.0  6433000.0
RE DISCCART  386400.0  6433000.0
RE DISCCART  386600.0  6433000.0
RE DISCCART  386800.0  6433000.0
RE DISCCART  382000.0  6433200.0
RE DISCCART  382200.0  6433200.0
RE DISCCART  382400.0  6433200.0
RE DISCCART  382600.0  6433200.0
RE DISCCART  382800.0  6433200.0
RE DISCCART  383000.0  6433200.0
RE DISCCART  383200.0  6433200.0
RE DISCCART  383400.0  6433200.0
RE DISCCART  383600.0  6433200.0
RE DISCCART  383800.0  6433200.0
RE DISCCART  384000.0  6433200.0
RE DISCCART  384200.0  6433200.0
RE DISCCART  384400.0  6433200.0
RE DISCCART  384600.0  6433200.0
RE DISCCART  384800.0  6433200.0
RE DISCCART  385000.0  6433200.0
RE DISCCART  385200.0  6433200.0
RE DISCCART  385400.0  6433200.0
RE DISCCART  385600.0  6433200.0
RE DISCCART  385800.0  6433200.0
RE DISCCART  386000.0  6433200.0
RE DISCCART  386200.0  6433200.0
RE DISCCART  386400.0  6433200.0
RE DISCCART  386600.0  6433200.0
RE DISCCART  386800.0  6433200.0
RE DISCCART  382000.0  6433400.0
RE DISCCART  382200.0  6433400.0
RE DISCCART  382400.0  6433400.0
RE DISCCART  382600.0  6433400.0
RE DISCCART  382800.0  6433400.0
RE DISCCART  383000.0  6433400.0
RE DISCCART  383200.0  6433400.0
RE DISCCART  383400.0  6433400.0
RE DISCCART  383600.0  6433400.0
RE DISCCART  383800.0  6433400.0
RE DISCCART  384000.0  6433400.0
RE DISCCART  384200.0  6433400.0
RE DISCCART  384400.0  6433400.0
RE DISCCART  384600.0  6433400.0
RE DISCCART  384800.0  6433400.0
RE DISCCART  385000.0  6433400.0
RE DISCCART  385200.0  6433400.0
RE DISCCART  385400.0  6433400.0
RE DISCCART  385600.0  6433400.0
RE DISCCART  385800.0  6433400.0
RE DISCCART  386000.0  6433400.0
RE DISCCART  386200.0  6433400.0
RE DISCCART  386400.0  6433400.0
RE DISCCART  386600.0  6433400.0
RE DISCCART  386800.0  6433400.0
RE DISCCART  382000.0  6433600.0
RE DISCCART  382200.0  6433600.0
RE DISCCART  382400.0  6433600.0
RE DISCCART  382600.0  6433600.0
RE DISCCART  382800.0  6433600.0
RE DISCCART  383000.0  6433600.0
RE DISCCART  383200.0  6433600.0
RE DISCCART  383400.0  6433600.0
RE DISCCART  383600.0  6433600.0
RE DISCCART  383800.0  6433600.0
RE DISCCART  384000.0  6433600.0
RE DISCCART  384200.0  6433600.0
RE DISCCART  384400.0  6433600.0
RE DISCCART  384600.0  6433600.0
RE DISCCART  384800.0  6433600.0
RE DISCCART  385000.0  6433600.0
RE DISCCART  385200.0  6433600.0
RE DISCCART  385400.0  6433600.0
RE DISCCART  385600.0  6433600.0
RE DISCCART  385800.0  6433600.0
RE DISCCART  386000.0  6433600.0
RE DISCCART  386200.0  6433600.0
RE DISCCART  386400.0  6433600.0
RE DISCCART  386600.0  6433600.0
RE DISCCART  386800.0  6433600.0
RE DISCCART  382000.0  6433800.0
RE DISCCART  382200.0  6433800.0
RE DISCCART  382400.0  6433800.0
RE DISCCART  382600.0  6433800.0
RE DISCCART  382800.0  6433800.0
RE DISCCART  383000.0  6433800.0
RE DISCCART  383200.0  6433800.0
RE DISCCART  383400.0  6433800.0
RE DISCCART  383600.0  6433800.0
RE DISCCART  383800.0  6433800.0
RE DISCCART  384000.0  6433800.0
RE DISCCART  384200.0  6433800.0
RE DISCCART  384400.0  6433800.0
RE DISCCART  384600.0  6433800.0
RE DISCCART  384800.0  6433800.0
RE DISCCART  385000.0  6433800.0
RE DISCCART  385200.0  6433800.0
RE DISCCART  385400.0  6433800.0
RE DISCCART  385600.0  6433800.0
RE DISCCART  385800.0  6433800.0
RE DISCCART  386000.0  6433800.0
RE DISCCART  386200.0  6433800.0
RE DISCCART  386400.0  6433800.0
RE DISCCART  386600.0  6433800.0
```

RE DISCCART 386800.0 6433800.0
RE DISCCART 382000.0 6434000.0
RE DISCCART 382200.0 6434000.0
RE DISCCART 382400.0 6434000.0
RE DISCCART 382600.0 6434000.0
RE DISCCART 382800.0 6434000.0
RE DISCCART 383000.0 6434000.0
RE DISCCART 383200.0 6434000.0
RE DISCCART 383400.0 6434000.0
RE DISCCART 383600.0 6434000.0
RE DISCCART 383800.0 6434000.0
RE DISCCART 384000.0 6434000.0
RE DISCCART 384200.0 6434000.0
RE DISCCART 384400.0 6434000.0
RE DISCCART 384600.0 6434000.0
RE DISCCART 384800.0 6434000.0
RE DISCCART 385000.0 6434000.0
RE DISCCART 385200.0 6434000.0
RE DISCCART 385400.0 6434000.0
RE DISCCART 385600.0 6434000.0
RE DISCCART 385800.0 6434000.0
RE DISCCART 386000.0 6434000.0
RE DISCCART 386200.0 6434000.0
RE DISCCART 386400.0 6434000.0
RE DISCCART 386600.0 6434000.0
RE DISCCART 386800.0 6434000.0
RE DISCCART 382000.0 6434200.0
RE DISCCART 382200.0 6434200.0
RE DISCCART 382400.0 6434200.0
RE DISCCART 382600.0 6434200.0
RE DISCCART 382800.0 6434200.0
RE DISCCART 383000.0 6434200.0
RE DISCCART 383200.0 6434200.0
RE DISCCART 383400.0 6434200.0
RE DISCCART 383600.0 6434200.0
RE DISCCART 383800.0 6434200.0
RE DISCCART 384000.0 6434200.0
RE DISCCART 384200.0 6434200.0
RE DISCCART 384400.0 6434200.0
RE DISCCART 384600.0 6434200.0
RE DISCCART 384800.0 6434200.0
RE DISCCART 385000.0 6434200.0
RE DISCCART 385200.0 6434200.0
RE DISCCART 385400.0 6434200.0
RE DISCCART 385600.0 6434200.0
RE DISCCART 385800.0 6434200.0
RE DISCCART 386000.0 6434200.0
RE DISCCART 386200.0 6434200.0
RE DISCCART 386400.0 6434200.0
RE DISCCART 386600.0 6434200.0
RE DISCCART 386800.0 6434200.0
RE DISCCART 382000.0 6434400.0
RE DISCCART 382200.0 6434400.0
RE DISCCART 382400.0 6434400.0
RE DISCCART 382600.0 6434400.0
RE DISCCART 382800.0 6434400.0
RE DISCCART 383000.0 6434400.0
RE DISCCART 383200.0 6434400.0
RE DISCCART 383400.0 6434400.0
RE DISCCART 383600.0 6434400.0
RE DISCCART 383800.0 6434400.0
RE DISCCART 384000.0 6434400.0
RE DISCCART 384200.0 6434400.0
RE DISCCART 384400.0 6434400.0
RE DISCCART 384600.0 6434400.0
RE DISCCART 384800.0 6434400.0
RE DISCCART 385000.0 6434400.0
RE DISCCART 385200.0 6434400.0
RE DISCCART 385400.0 6434400.0
RE DISCCART 385600.0 6434400.0
RE DISCCART 385800.0 6434400.0
RE DISCCART 386000.0 6434400.0
RE DISCCART 386200.0 6434400.0
RE DISCCART 386400.0 6434400.0
RE DISCCART 386600.0 6434400.0
RE DISCCART 386800.0 6434400.0
RE DISCCART 382000.0 6434600.0
RE DISCCART 382200.0 6434600.0
RE DISCCART 382400.0 6434600.0
RE DISCCART 382600.0 6434600.0
RE DISCCART 382800.0 6434600.0
RE DISCCART 383000.0 6434600.0
RE DISCCART 383200.0 6434600.0
RE DISCCART 383400.0 6434600.0
RE DISCCART 383600.0 6434600.0
RE DISCCART 383800.0 6434600.0
RE DISCCART 384000.0 6434600.0
RE DISCCART 384200.0 6434600.0
RE DISCCART 384400.0 6434600.0
RE DISCCART 384600.0 6434600.0
RE DISCCART 384800.0 6434600.0
RE DISCCART 385000.0 6434600.0
RE DISCCART 385200.0 6434600.0
RE DISCCART 385400.0 6434600.0
RE DISCCART 385600.0 6434600.0
RE DISCCART 385800.0 6434600.0
RE DISCCART 386000.0 6434600.0
RE DISCCART 386200.0 6434600.0
RE DISCCART 386400.0 6434600.0
RE DISCCART 386600.0 6434600.0
RE DISCCART 386800.0 6434600.0
RE DISCCART 382000.0 6434800.0
RE DISCCART 382200.0 6434800.0
RE DISCCART 382400.0 6434800.0
RE DISCCART 382600.0 6434800.0
RE DISCCART 382800.0 6434800.0
RE DISCCART 383000.0 6434800.0
RE DISCCART 383200.0 6434800.0
RE DISCCART 383400.0 6434800.0
RE DISCCART 383600.0 6434800.0
RE DISCCART 383800.0 6434800.0
RE DISCCART 384000.0 6434800.0
RE DISCCART 384200.0 6434800.0
RE DISCCART 384400.0 6434800.0
RE DISCCART 384600.0 6434800.0
RE DISCCART 384800.0 6434800.0
RE DISCCART 385000.0 6434800.0
RE DISCCART 385200.0 6434800.0
RE DISCCART 385400.0 6434800.0
RE DISCCART 385600.0 6434800.0
RE DISCCART 385800.0 6434800.0
RE DISCCART 386000.0 6434800.0
RE DISCCART 386200.0 6434800.0
RE DISCCART 386400.0 6434800.0
RE DISCCART 386600.0 6434800.0
RE DISCCART 386800.0 6434800.0
RE DISCCART 382000.0 6435000.0
RE DISCCART 382200.0 6435000.0
RE DISCCART 382400.0 6435000.0
RE DISCCART 382600.0 6435000.0
RE DISCCART 382800.0 6435000.0
RE DISCCART 383000.0 6435000.0
RE DISCCART 383200.0 6435000.0
RE DISCCART 383400.0 6435000.0
RE DISCCART 383600.0 6435000.0
RE DISCCART 383800.0 6435000.0
RE DISCCART 384000.0 6435000.0
RE DISCCART 384200.0 6435000.0
RE DISCCART 384400.0 6435000.0
RE DISCCART 384600.0 6435000.0
RE DISCCART 384800.0 6435000.0
RE DISCCART 385000.0 6435000.0
RE DISCCART 385200.0 6435000.0
RE DISCCART 385400.0 6435000.0
RE DISCCART 385600.0 6435000.0
RE DISCCART 385800.0 6435000.0

FINAL

RE DISCCART 386000.0 6435000.0
RE DISCCART 386200.0 6435000.0
RE DISCCART 386400.0 6435000.0
RE DISCCART 386600.0 6435000.0
RE DISCCART 386800.0 6435000.0
RE DISCCART 382000.0 6435200.0
RE DISCCART 382200.0 6435200.0
RE DISCCART 382400.0 6435200.0
RE DISCCART 382600.0 6435200.0
RE DISCCART 382800.0 6435200.0
RE DISCCART 383000.0 6435200.0
RE DISCCART 383200.0 6435200.0
RE DISCCART 383400.0 6435200.0
RE DISCCART 383600.0 6435200.0
RE DISCCART 383800.0 6435200.0
RE DISCCART 384000.0 6435200.0
RE DISCCART 384200.0 6435200.0
RE DISCCART 384400.0 6435200.0
RE DISCCART 384600.0 6435200.0
RE DISCCART 384800.0 6435200.0
RE DISCCART 385000.0 6435200.0
RE DISCCART 385200.0 6435200.0
RE DISCCART 385400.0 6435200.0
RE DISCCART 385600.0 6435200.0
RE DISCCART 385800.0 6435200.0
RE DISCCART 386000.0 6435200.0
RE DISCCART 386200.0 6435200.0
RE DISCCART 386400.0 6435200.0
RE DISCCART 386600.0 6435200.0
RE DISCCART 386800.0 6435200.0
RE DISCCART 382000.0 6435400.0
RE DISCCART 382200.0 6435400.0
RE DISCCART 382400.0 6435400.0
RE DISCCART 382600.0 6435400.0
RE DISCCART 382800.0 6435400.0
RE DISCCART 383000.0 6435400.0
RE DISCCART 383200.0 6435400.0
RE DISCCART 383400.0 6435400.0
RE DISCCART 383600.0 6435400.0
RE DISCCART 383800.0 6435400.0
RE DISCCART 384000.0 6435400.0
RE DISCCART 384200.0 6435400.0
RE DISCCART 384400.0 6435400.0
RE DISCCART 384600.0 6435400.0
RE DISCCART 384800.0 6435400.0
RE DISCCART 385000.0 6435400.0
RE DISCCART 385200.0 6435400.0
RE DISCCART 385400.0 6435400.0
RE DISCCART 385600.0 6435400.0
RE DISCCART 385800.0 6435400.0
RE DISCCART 386000.0 6435400.0
RE DISCCART 386200.0 6435400.0
RE DISCCART 386400.0 6435400.0
RE DISCCART 386600.0 6435400.0
RE DISCCART 386800.0 6435400.0
RE DISCCART 382000.0 6435600.0
RE DISCCART 382200.0 6435600.0
RE DISCCART 382400.0 6435600.0
RE DISCCART 382600.0 6435600.0
RE DISCCART 382800.0 6435600.0
RE DISCCART 383000.0 6435600.0
RE DISCCART 383200.0 6435600.0
RE DISCCART 383400.0 6435600.0
RE DISCCART 383600.0 6435600.0
RE DISCCART 383800.0 6435600.0
RE DISCCART 384000.0 6435600.0
RE DISCCART 384200.0 6435600.0
RE DISCCART 384400.0 6435600.0
RE DISCCART 384600.0 6435600.0
RE DISCCART 384800.0 6435600.0
RE DISCCART 385000.0 6435600.0
RE DISCCART 385200.0 6435600.0
RE DISCCART 385400.0 6435600.0
RE DISCCART 385600.0 6435600.0
RE DISCCART 385800.0 6435600.0
RE DISCCART 386000.0 6435600.0
RE DISCCART 386200.0 6435600.0
RE DISCCART 386400.0 6435600.0
RE DISCCART 386600.0 6435600.0
RE DISCCART 386800.0 6435600.0
RE DISCCART 382000.0 6435800.0
RE DISCCART 382200.0 6435800.0
RE DISCCART 382400.0 6435800.0
RE DISCCART 382600.0 6435800.0
RE DISCCART 382800.0 6435800.0
RE DISCCART 383000.0 6435800.0
RE DISCCART 383200.0 6435800.0
RE DISCCART 383400.0 6435800.0
RE DISCCART 383600.0 6435800.0
RE DISCCART 383800.0 6435800.0
RE DISCCART 384000.0 6435800.0
RE DISCCART 384200.0 6435800.0
RE DISCCART 384400.0 6435800.0
RE DISCCART 384600.0 6435800.0
RE DISCCART 384800.0 6435800.0
RE DISCCART 385000.0 6435800.0
RE DISCCART 385200.0 6435800.0
RE DISCCART 385400.0 6435800.0
RE DISCCART 385600.0 6435800.0
RE DISCCART 385800.0 6435800.0
RE DISCCART 386000.0 6435800.0
RE DISCCART 386200.0 6435800.0
RE DISCCART 386400.0 6435800.0
RE DISCCART 386600.0 6435800.0
RE DISCCART 386800.0 6435800.0
RE DISCCART 382000.0 6436000.0
RE DISCCART 382200.0 6436000.0
RE DISCCART 382400.0 6436000.0
RE DISCCART 382600.0 6436000.0
RE DISCCART 382800.0 6436000.0
RE DISCCART 383000.0 6436000.0
RE DISCCART 383200.0 6436000.0
RE DISCCART 383400.0 6436000.0
RE DISCCART 383600.0 6436000.0
RE DISCCART 383800.0 6436000.0
RE DISCCART 384000.0 6436000.0
RE DISCCART 384200.0 6436000.0
RE DISCCART 384400.0 6436000.0
RE DISCCART 384600.0 6436000.0
RE DISCCART 384800.0 6436000.0
RE DISCCART 385000.0 6436000.0
RE DISCCART 385200.0 6436000.0
RE DISCCART 385400.0 6436000.0
RE DISCCART 385600.0 6436000.0
RE DISCCART 385800.0 6436000.0
RE DISCCART 386000.0 6436000.0
RE DISCCART 386200.0 6436000.0
RE DISCCART 386400.0 6436000.0
RE DISCCART 386600.0 6436000.0
RE DISCCART 386800.0 6436000.0
RE DISCCART 382000.0 6436200.0
RE DISCCART 382200.0 6436200.0
RE DISCCART 382400.0 6436200.0
RE DISCCART 382600.0 6436200.0
RE DISCCART 382800.0 6436200.0
RE DISCCART 383000.0 6436200.0
RE DISCCART 383200.0 6436200.0
RE DISCCART 383400.0 6436200.0
RE DISCCART 383600.0 6436200.0
RE DISCCART 383800.0 6436200.0
RE DISCCART 384000.0 6436200.0
RE DISCCART 384200.0 6436200.0
RE DISCCART 384400.0 6436200.0
RE DISCCART 384600.0 6436200.0
RE DISCCART 384800.0 6436200.0
RE DISCCART 385000.0 6436200.0

RE DISCCART 385200.0 6436200.0
RE DISCCART 385400.0 6436200.0
RE DISCCART 385600.0 6436200.0
RE DISCCART 385800.0 6436200.0
RE DISCCART 386000.0 6436200.0
RE DISCCART 386200.0 6436200.0
RE DISCCART 386400.0 6436200.0
RE DISCCART 386600.0 6436200.0
RE DISCCART 386800.0 6436200.0
RE DISCCART 382000.0 6436400.0
RE DISCCART 382200.0 6436400.0
RE DISCCART 382400.0 6436400.0
RE DISCCART 382600.0 6436400.0
RE DISCCART 382800.0 6436400.0
RE DISCCART 383000.0 6436400.0
RE DISCCART 383200.0 6436400.0
RE DISCCART 383400.0 6436400.0
RE DISCCART 383600.0 6436400.0
RE DISCCART 383800.0 6436400.0
RE DISCCART 384000.0 6436400.0
RE DISCCART 384200.0 6436400.0
RE DISCCART 384400.0 6436400.0
RE DISCCART 384600.0 6436400.0
RE DISCCART 384800.0 6436400.0
RE DISCCART 385000.0 6436400.0
RE DISCCART 385200.0 6436400.0
RE DISCCART 385400.0 6436400.0
RE DISCCART 385600.0 6436400.0
RE DISCCART 385800.0 6436400.0
RE DISCCART 386000.0 6436400.0
RE DISCCART 386200.0 6436400.0
RE DISCCART 386400.0 6436400.0
RE DISCCART 386600.0 6436400.0
RE DISCCART 386800.0 6436400.0
RE DISCCART 382000.0 6436600.0
RE DISCCART 382200.0 6436600.0
RE DISCCART 382400.0 6436600.0
RE DISCCART 382600.0 6436600.0
RE DISCCART 382800.0 6436600.0
RE DISCCART 383000.0 6436600.0
RE DISCCART 383200.0 6436600.0
RE DISCCART 383400.0 6436600.0
RE DISCCART 383600.0 6436600.0
RE DISCCART 383800.0 6436600.0
RE DISCCART 384000.0 6436600.0
RE DISCCART 384200.0 6436600.0
RE DISCCART 384400.0 6436600.0
RE DISCCART 384600.0 6436600.0
RE DISCCART 384800.0 6436600.0
RE DISCCART 385000.0 6436600.0
RE DISCCART 385200.0 6436600.0
RE DISCCART 385400.0 6436600.0
RE DISCCART 385600.0 6436600.0
RE DISCCART 385800.0 6436600.0
RE DISCCART 386000.0 6436600.0
RE DISCCART 386200.0 6436600.0
RE DISCCART 386400.0 6436600.0
RE DISCCART 386600.0 6436600.0
RE DISCCART 386800.0 6436600.0
** BOUNDARY BND1
RE DISCCART 383206.2 6432728.7
RE DISCCART 383206.2 6432703.7
RE DISCCART 383206.2 6432678.7
RE DISCCART 383206.2 6432653.7
RE DISCCART 383206.2 6432628.7
RE DISCCART 383206.2 6432603.7
RE DISCCART 383206.2 6432578.7
RE DISCCART 383206.2 6432568.6
RE DISCCART 383207.14 6432543.62
RE DISCCART 383208.07 6432518.64
RE DISCCART 383209.01 6432493.65
RE DISCCART 383209.94 6432468.67
RE DISCCART 383210.88 6432443.69
RE DISCCART 383211.81 6432418.71
RE DISCCART 383212.75 6432393.72
RE DISCCART 383213.1 6432384.3
RE DISCCART 383211.24 6432359.37
RE DISCCART 383209.38 6432334.44
RE DISCCART 383207.51 6432309.51
RE DISCCART 383205.65 6432284.58
RE DISCCART 383203.79 6432259.65
RE DISCCART 383201.93 6432234.72
RE DISCCART 383200.07 6432209.79
RE DISCCART 383199.2 6432198.2
RE DISCCART 383196.7 6432173.33
RE DISCCART 383194.2 6432148.45
RE DISCCART 383192.2 6432128.6
RE DISCCART 383190.4 6432103.67
RE DISCCART 383188.8 6432081.6
RE DISCCART 383212.77 6432074.5
RE DISCCART 383236.74 6432067.41
RE DISCCART 383260.71 6432060.31
RE DISCCART 383282.7 6432053.8
RE DISCCART 383306.97 6432047.82
RE DISCCART 383331.25 6432041.84
RE DISCCART 383355.52 6432035.86
RE DISCCART 383379.8 6432029.88
RE DISCCART 383404.07 6432023.9
RE DISCCART 383428.35 6432017.92
RE DISCCART 383452.62 6432011.94
RE DISCCART 383476.89 6432005.96
RE DISCCART 383501.17 6431999.98
RE DISCCART 383508.8 6431998.1
RE DISCCART 383533.49 6431994.17
RE DISCCART 383558.18 6431990.24
RE DISCCART 383582.87 6431986.31
RE DISCCART 383607.56 6431982.38
RE DISCCART 383632.25 6431978.45
RE DISCCART 383656.94 6431974.52
RE DISCCART 383681.62 6431970.59
RE DISCCART 383706.31 6431966.66
RE DISCCART 383731.0 6431962.73
RE DISCCART 383748.8 6431959.9
RE DISCCART 383773.8 6431959.9
RE DISCCART 383798.8 6431959.9
RE DISCCART 383823.8 6431959.9
RE DISCCART 383848.8 6431959.9
RE DISCCART 383873.8 6431959.9
RE DISCCART 383898.8 6431959.9
RE DISCCART 383923.8 6431959.9
RE DISCCART 383948.8 6431959.9
RE DISCCART 383973.8 6431959.9
RE DISCCART 383998.8 6431959.9
RE DISCCART 384023.8 6431959.9
RE DISCCART 384048.8 6431959.9
RE DISCCART 384073.8 6431959.9
RE DISCCART 384098.8 6431959.9
RE DISCCART 384103.7 6431959.9
RE DISCCART 384119.28 6431979.45
RE DISCCART 384124.5 6431986.0
RE DISCCART 384149.32 6431982.98
RE DISCCART 384168.0 6431980.7
RE DISCCART 384181.57 6431959.7
RE DISCCART 384183.7 6431956.4
RE DISCCART 384208.68 6431957.51
RE DISCCART 384233.65 6431958.61
RE DISCCART 384258.63 6431959.72
RE DISCCART 384283.6 6431960.82
RE DISCCART 384308.58 6431961.93
RE DISCCART 384333.55 6431963.03
RE DISCCART 384358.53 6431964.14
RE DISCCART 384380.2 6431965.1
RE DISCCART 384402.79 6431975.82
RE DISCCART 384425.37 6431986.53
RE DISCCART 384447.96 6431997.25
RE DISCCART 384470.55 6432007.96

RE DISCCART 384493.13 6432018.68
RE DISCCART 384515.72 6432029.4
RE DISCCART 384538.31 6432040.11
RE DISCCART 384560.9 6432050.83
RE DISCCART 384583.48 6432061.54
RE DISCCART 384585.5 6432062.5
RE DISCCART 384603.62 6432079.73
RE DISCCART 384621.73 6432096.95
RE DISCCART 384639.85 6432114.18
RE DISCCART 384656.8 6432130.3
RE DISCCART 384670.66 6432151.11
RE DISCCART 384684.52 6432171.91
RE DISCCART 384698.38 6432192.72
RE DISCCART 384698.5 6432192.9
RE DISCCART 384708.65 6432215.75
RE DISCCART 384718.81 6432238.59
RE DISCCART 384728.96 6432261.44
RE DISCCART 384733.3 6432271.2
RE DISCCART 384736.1 6432296.04
RE DISCCART 384738.9 6432320.88
RE DISCCART 384741.71 6432345.73
RE DISCCART 384743.7 6432363.4
RE DISCCART 384742.74 6432388.38
RE DISCCART 384741.78 6432413.36
RE DISCCART 384740.83 6432438.34
RE DISCCART 384739.87 6432463.33
RE DISCCART 384738.91 6432488.31
RE DISCCART 384737.95 6432513.29
RE DISCCART 384737.0 6432538.27
RE DISCCART 384736.04 6432563.25
RE DISCCART 384735.08 6432588.23
RE DISCCART 384734.12 6432613.22
RE DISCCART 384733.3 6432634.7
RE DISCCART 384733.45 6432659.7
RE DISCCART 384733.61 6432684.7
RE DISCCART 384733.76 6432709.7
RE DISCCART 384733.92 6432734.7
RE DISCCART 384734.07 6432759.7
RE DISCCART 384734.23 6432784.7
RE DISCCART 384734.38 6432809.7
RE DISCCART 384734.54 6432834.7
RE DISCCART 384734.69 6432859.7
RE DISCCART 384734.85 6432884.7
RE DISCCART 384735.0 6432909.6
RE DISCCART 384710.9 6432916.25
RE DISCCART 384686.8 6432922.89
RE DISCCART 384684.6 6432923.5
RE DISCCART 384685.96 6432948.46
RE DISCCART 384687.31 6432973.43
RE DISCCART 384688.67 6432998.39
RE DISCCART 384690.03 6433023.35
RE DISCCART 384691.39 6433048.32
RE DISCCART 384692.74 6433073.28
RE DISCCART 384694.1 6433098.24
RE DISCCART 384695.46 6433123.2
RE DISCCART 384696.82 6433148.17
RE DISCCART 384698.17 6433173.13
RE DISCCART 384699.53 6433198.09
RE DISCCART 384700.89 6433223.06
RE DISCCART 384702.0 6433243.5
RE DISCCART 384688.1 6433231.3
RE DISCCART 384673.24 6433211.2
RE DISCCART 384663.7 6433198.3
RE DISCCART 384650.87 6433176.84
RE DISCCART 384642.9 6433163.5
RE DISCCART 384633.42 6433140.37
RE DISCCART 384627.2 6433125.2
RE DISCCART 384622.0 6433100.9
RE DISCCART 384622.0 6433075.9
RE DISCCART 384622.0 6433050.9
RE DISCCART 384622.0 6433045.2
RE DISCCART 384597.0 6433045.2
RE DISCCART 384572.0 6433045.2
RE DISCCART 384547.0 6433045.2
RE DISCCART 384522.0 6433045.2
RE DISCCART 384497.0 6433045.2
RE DISCCART 384472.0 6433045.2
RE DISCCART 384447.0 6433045.2
RE DISCCART 384422.0 6433045.2
RE DISCCART 384397.0 6433045.2
RE DISCCART 384372.0 6433045.2
RE DISCCART 384347.0 6433045.2
RE DISCCART 384322.0 6433045.2
RE DISCCART 384297.0 6433045.2
RE DISCCART 384272.0 6433045.2
RE DISCCART 384247.0 6433045.2
RE DISCCART 384222.0 6433045.2
RE DISCCART 384197.0 6433045.2
RE DISCCART 384172.0 6433045.2
RE DISCCART 384147.0 6433045.2
RE DISCCART 384122.0 6433045.2
RE DISCCART 384097.0 6433045.2
RE DISCCART 384072.0 6433045.2
RE DISCCART 384047.0 6433045.2
RE DISCCART 384022.0 6433045.2
RE DISCCART 383997.0 6433045.2
RE DISCCART 383972.0 6433045.2
RE DISCCART 383947.0 6433045.2
RE DISCCART 383922.0 6433045.2
RE DISCCART 383897.0 6433045.2
RE DISCCART 383872.0 6433045.2
RE DISCCART 383847.0 6433045.2
RE DISCCART 383822.0 6433045.2
RE DISCCART 383797.0 6433045.2
RE DISCCART 383785.4 6433045.2
RE DISCCART 383785.53 6433020.2
RE DISCCART 383785.67 6432995.2
RE DISCCART 383785.8 6432970.2
RE DISCCART 383785.94 6432945.2
RE DISCCART 383786.07 6432920.2
RE DISCCART 383786.21 6432895.2
RE DISCCART 383786.34 6432870.2
RE DISCCART 383786.47 6432845.2
RE DISCCART 383786.61 6432820.2
RE DISCCART 383786.74 6432795.2
RE DISCCART 383786.88 6432770.2
RE DISCCART 383787.01 6432745.2
RE DISCCART 383787.1 6432728.7
RE DISCCART 383762.1 6432728.7
RE DISCCART 383737.1 6432728.7
RE DISCCART 383712.1 6432728.7
RE DISCCART 383687.1 6432728.7
RE DISCCART 383662.1 6432728.7
RE DISCCART 383637.1 6432728.7
RE DISCCART 383612.1 6432728.7
RE DISCCART 383587.1 6432728.7
RE DISCCART 383562.1 6432728.7
RE DISCCART 383537.1 6432728.7
RE DISCCART 383512.1 6432728.7
RE DISCCART 383487.1 6432728.7
RE DISCCART 383462.1 6432728.7
RE DISCCART 383437.1 6432728.7
RE DISCCART 383412.1 6432728.7
RE DISCCART 383387.1 6432728.7
RE DISCCART 383362.1 6432728.7
RE DISCCART 383337.1 6432728.7
RE DISCCART 383312.1 6432728.7
RE DISCCART 383287.1 6432728.7
RE DISCCART 383262.1 6432728.7
RE DISCCART 383237.1 6432728.7
RE DISCCART 383212.1 6432728.7
RE DISCCART 383200.9 6432728.7
RE DISCCART 383209.6 6432730.4
RE FINISHED

ME STARTING

```
ME INPUTFIL  V:\kw97aus.isc
ME ANEMHGHT  10  METERS
ME SURFDATA  1  1997
ME UAIRDATA  1  1997
ME STARTEND  1997  01  01  1  1997  12  31  24
ME WDROTATE  180
ME FINISHED

OU STARTING
OU RECTABLE  1  FIRST
OU PLOTFILE  1  NOXSHUT  FIRST  "V:\Expansion
Emissions Scenario\ISC_Rural_Exp\CSBP Expansion -
Rural_NOxShut_1hr.PLT"
OU FINISHED

** PROJECTN  0 104 7 -177 0 0.9996 500000 0
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
LAYOUT22.JPG" "CSBP LAYOUT22" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 383111.43
384872.91 6431893.26 6432839.55
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
LAYOUT42.JPG" "CSBP LAYOUT42" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 383425.22
384023.89 6432476.39 6432798
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
LAYOUT52.JPG" "CSBP LAYOUT52" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215 0 0 1 1
384128.82 384723.2 6431933.6 6432251
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
LAYOUT32.JPG" "CSBP LAYOUT32" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 383292.7
383882.87 6432225.81 6432542.86
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP W
AERIAL1.JPG" "CSBP W AERIAL1" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215 0 0 1 1
376819.74 388838.78 6429266.93 6436015.22
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP S
AERIAL2.JPG" "CSBP S AERIAL2" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215 0 0 1 1
380710.29 388112.25 6427877.74 6432017.73
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP N
AERIAL1.JPG" "CSBP N AERIAL1" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215 0 0 1 1
380755.77 388230.52 6431834.46 6436031.28
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP ROAD
MAP1.JPG" "CSBP ROAD MAP1" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215 0 0 1 1
381263.37 387261.93 6430981.13 6434468.75
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
AERIAL11.JPG" "CSBP AERIAL11" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 381633.7
386801.59 6431276.68 6434137.41
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
AERIAL22.JPG" "CSBP AERIAL22" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 382975.67
384848.18 6431895.74 6432762.3
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
AERIAL43.JPG" "CSBP AERIAL43" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 383288.79
383903.83 6432239.34 6432537.99
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
AERIAL52.JPG" "CSBP AERIAL52" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 384197.18
384595.93 6431985.56 6432207.15
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP
AERIAL62.JPG" "CSBP AERIAL62" 3 UNKNOWN
UNKNOWN 1 0 0 0 0 0 0 1 0 0 0 0 0 0 1 1 383539.01
383939.5 6432550.56 6432770.82
** MAPLAYER "C:\PROGRAM
FILES\BREEZE\ISC5\PROJECTS\CSBP\CSBP LAYOUT
PROP BOUND1.JPG" "CSBP LAYOUT PROP BOUND1"
3 UNKNOWN UNKNOWN 1 0 0 0 0 0 0 0 0 0 0 16777215
0 0 1 1 382423.91 385193.44 6431804.96 6433292.79
** OUTFILE  "V:\Expansion Emissions
Scenario\ISC_Rural_Exp\CSBP Expansion - Rural.LST"
** RAWFILE  "V:\Expansion Emissions
Scenario\ISC_Rural_Exp\CSBP Expansion - Rural.RAW"
** RAWFMT  2
** HILLBOUN  0 0 0 0

** POLLUTNT IDN  01  PM10  X
** POLLUTNT NAM  01  PM10
** POLLUTNT IDN  02  NH3  X
** POLLUTNT NAM  02  NH3
** POLLUTNT IDN  03  NOX_NORM1  X
** POLLUTNT NAM  03  NOx - Normal with new boiler
** POLLUTNT IDN  04  NOX_START  X
** POLLUTNT NAM  04  NOx - Startup
** POLLUTNT IDN  05  NOX_SHUT  X
** POLLUTNT NAM  05  NOx - Shutdown
** POLLUTNT IDN  06  NOX_NORM2  X
** POLLUTNT NAM  06  NOx - Normal with both boilers
** POLLUTNT EMS  SRC1 6.400000E-01 0 0 0 0 0
** POLLUTNT EMS  SRC2 1.810000E-01 2.900000E-01 0
0 0 0
** POLLUTNT EMS  SRC3 2.900000E-01 2.350000E-01 0
0 0 0
** POLLUTNT EMS  SRC4 0 0 1.067000E+01
1.067000E+01 0 1.067000E+01
** POLLUTNT EMS  SRC5 0 0 0 0 1.519000E+01 0
** POLLUTNT EMS  SRC6 0 0 5.170000E+00
5.170000E+00 5.170000E+00 5.170000E+00
** POLLUTNT EMS  SRC7 0 0 0 1.590000E+00
1.590000E+00 1.590000E+00
** POLLUTNT EMS  SRC8 0 0 2.390000E+00
2.390000E+00 2.390000E+00 2.390000E+00
** POLLUTNT EMS  SRC9 0 0 1.462000E+01
7.310000E+00 0 1.462000E+01
** POLLUTNT EMS  SRC10 0 0 0 1.890000E+01 0 0
** POLLUTNT EMS  SRC11 0 0 0 0 9.800000E+00 0
** POLLUTNT EMS  SRC12 0 0 1.462000E+01
1.462000E+01 0 1.462000E+01
** POLLUTNT EMS  SRC13 0 0 0 0 9.800000E+00 0
** POLLUTNT EMS  SRC14 3.300000E-01 4.400000E-02
0 0 0 0

** BUILDING BLD  1  1  0  22.3  5
** BUILDING IDN  BLD1
** BUILDING NAM  Prilling Plant
** BUILDING CRN  383583.6  6432396.9
** BUILDING CRN  383583.6  6432356.3
** BUILDING CRN  383598.9  6432356.3
** BUILDING CRN  383598.9  6432396.9
** BUILDING CRN  383583.6  6432396.9
** BUILDING BLD  2  1  0  65.3  24
** BUILDING IDN  BLD2
** BUILDING NAM  Prill Plant Stack
** BUILDING TNK  383592.3  6432411.9  8.3
** BUILDING BLD  4  1  0  18.9  4
** BUILDING IDN  BLD4
** BUILDING NAM  No 1 Compuonds Bin
** BUILDING CRN  383608.7  6432389.6
** BUILDING CRN  383608.7  6432341.3
```

** BUILDING CRN 383914.2 6432341.3
** BUILDING CRN 383914.2 6432389.6
** BUILDING BLD 5 1 0 25.9 4
** BUILDING IDN BLD5
** BUILDING NAM S No 1 Compounds Bin
** BUILDING CRN 383686.6 6432341.3
** BUILDING CRN 383686.6 6432317.5
** BUILDING CRN 383763.1 6432317.5
** BUILDING CRN 383763.1 6432341.3
** BUILDING BLD 6 1 0 21.34 6
** BUILDING IDN BLD6
** BUILDING NAM S of No 1 Compounds Bin
** BUILDING CRN 383762.6 6432341.3
** BUILDING CRN 383762.6 6432330.8
** BUILDING CRN 383877.9 6432331.0
** BUILDING CRN 383877.9 6432330.3
** BUILDING CRN 383877.9 6432341.3
** BUILDING CRN 383761.6 6432341.3
** BUILDING BLD 7 1 0 10 4
** BUILDING IDN BLD7
** BUILDING NAM W side Prilling Plant
** BUILDING CRN 383583.6 6432376.3
** BUILDING CRN 383578.8 6432376.3
** BUILDING CRN 383578.8 6432355.6
** BUILDING CRN 383583.6 6432355.6
** BUILDING BLD 8 1 0 33.5 5
** BUILDING IDN BLD8
** BUILDING NAM W of Gran Plant
** BUILDING CRN 383604.8 6432438.2
** BUILDING CRN 383604.8 6432426.4
** BUILDING CRN 383608.9 6432426.4
** BUILDING CRN 383608.7 6432438.4
** BUILDING CRN 383603.6 6432438.2
** BUILDING BLD 9 1 0 33.5 5
** BUILDING IDN BLD9
** BUILDING NAM Gran Plant
** BUILDING CRN 383609.2 6432450.2
** BUILDING CRN 383609.2 6432401.9
** BUILDING CRN 383633.7 6432402.1
** BUILDING CRN 383633.5 6432450.4
** BUILDING CRN 383608.9 6432450.4
** BUILDING BLD 11 1 0 23.2 5
** BUILDING IDN BLD11
** BUILDING NAM No. 2 Compounds Bin
** BUILDING CRN 383633.7 6432450.4
** BUILDING CRN 383633.5 6432401.9
** BUILDING CRN 383929.3 6432402.6
** BUILDING CRN 383929.0 6432451.5
** BUILDING CRN 383632.7 6432450.4
** BUILDING BLD 12 1 0 18.3 5
** BUILDING IDN BLD12
** BUILDING NAM N of No. 2 Compounds Bin
** BUILDING CRN 383704.3 6432477.5
** BUILDING CRN 383704.5 6432442.5
** BUILDING CRN 383891.7 6432442.5
** BUILDING CRN 383891.2 6432477.8
** BUILDING CRN 383704.3 6432477.8
** BUILDING BLD 14 1 0 19.7 4
** BUILDING IDN BLD14
** BUILDING NAM Compounds Building
** BUILDING CRN 383582.6 6432474.7
** BUILDING CRN 383582.6 6432429.0
** BUILDING CRN 383597.4 6432429.0
** BUILDING CRN 383597.4 6432474.7
** BUILDING BLD 15 1 0 10 4
** BUILDING IDN BLD15
** BUILDING NAM Cooling Tower 1
** BUILDING CRN 383641.7 6432520.0
** BUILDING CRN 383641.6 6432488.5
** BUILDING CRN 383656.6 6432488.5
** BUILDING CRN 383656.6 6432520.1
** BUILDING BLD 16 1 0 7 12
** BUILDING IDN BLD16
** BUILDING NAM W of Nitric Acid Plant
** BUILDING CRN 383515.5 6432524.7
** BUILDING CRN 383515.5 6432494.3
** BUILDING CRN 383535.7 6432494.3
** BUILDING CRN 383535.4 6432502.1
** BUILDING CRN 383543.9 6432502.1
** BUILDING CRN 383543.9 6432491.5
** BUILDING CRN 383552.9 6432491.5
** BUILDING CRN 383552.9 6432523.3
** BUILDING CRN 383543.9 6432523.3
** BUILDING CRN 383543.9 6432519.3
** BUILDING CRN 383535.7 6432519.3
** BUILDING CRN 383535.7 6432524.7
** BUILDING BLD 17 1 0 19.5 4
** BUILDING IDN BLD17
** BUILDING NAM Nitric Acid Plant 1
** BUILDING CRN 383598.0 6432514.7
** BUILDING CRN 383598.0 6432504.1
** BUILDING CRN 383621.5 6432504.1
** BUILDING CRN 383621.4 6432514.8
** BUILDING BLD 18 1 0 19.5 4
** BUILDING IDN BLD18
** BUILDING NAM Nitric Acid Plant 2
** BUILDING CRN 383601.0 6432520.9
** BUILDING CRN 383601.0 6432515.0
** BUILDING CRN 383606.1 6432515.0
** BUILDING CRN 383606.1 6432520.9
** BUILDING BLD 19 1 0 19.5 4
** BUILDING IDN BLD19
** BUILDING NAM Nitric Acid Plant 3
** BUILDING CRN 383592.0 6432499.5
** BUILDING CRN 383592.0 6432487.3
** BUILDING CRN 383599.1 6432487.3
** BUILDING CRN 383599.1 6432499.4
** BUILDING BLD 20 1 0 19.5 5
** BUILDING IDN BLD20
** BUILDING NAM Nitric Acid Plant 4
** BUILDING CRN 383570.1 6432498.2
** BUILDING CRN 383570.1 6432486.6
** BUILDING CRN 383578.5 6432486.7
** BUILDING CRN 383578.5 6432498.4
** BUILDING CRN 383570.0 6432498.2
** BUILDING BLD 21 1 0 7 4
** BUILDING IDN BLD21
** BUILDING NAM W of Prill Plant
** BUILDING CRN 383509.9 6432430.1
** BUILDING CRN 383509.6 6432403.4
** BUILDING CRN 383520.1 6432403.7
** BUILDING CRN 383520.1 6432430.1
** BUILDING BLD 22 1 0 7 4
** BUILDING IDN BLD22
** BUILDING NAM W of Prill Plant
** BUILDING CRN 383520.2 6432373.8
** BUILDING CRN 383538.9 6432373.8
** BUILDING CRN 383538.9 6432391.8
** BUILDING CRN 383520.2 6432391.8
** BUILDING BLD 23 1 0 7 4
** BUILDING IDN BLD23
** BUILDING NAM W of Prill Plant
** BUILDING CRN 383506.2 6432379.4
** BUILDING CRN 383520.0 6432379.4
** BUILDING CRN 383520.0 6432391.8
** BUILDING CRN 383506.2 6432391.8
** BUILDING BLD 24 1 0 5 6
** BUILDING IDN BLD24
** BUILDING NAM W of Prill Plant
** BUILDING CRN 383509.0 6432375.0
** BUILDING CRN 383509.0 6432361.2
** BUILDING CRN 383499.8 6432361.2
** BUILDING CRN 383499.8 6432354.4
** BUILDING CRN 383516.2 6432354.4
** BUILDING CRN 383516.2 6432375.0
** BUILDING BLD 25 1 0 7 24

** BUILDING IDN BLD25
** BUILDING NAM N
** BUILDING TNK 383548.2 6432388.3 4.8
** BUILDING BLD 26 1 0 7 24
** BUILDING IDN BLD26
** BUILDING NAM 2nd N
** BUILDING TNK 383548.0 6432374.5 4.5
** BUILDING BLD 27 1 0 7 24
** BUILDING IDN BLD27
** BUILDING NAM 2nd S
** BUILDING TNK 383547.8 6432363.5 5.5
** BUILDING BLD 28 1 0 7 24
** BUILDING IDN BLD28
** BUILDING NAM S
** BUILDING TNK 383548.0 6432350.6 5.5
** BUILDING BLD 29 1 0 12.2 4
** BUILDING IDN BLD29
** BUILDING NAM SMP Bldg
** BUILDING CRN 383375.7 6432252.0
** BUILDING CRN 383375.7 6432227.5
** BUILDING CRN 383557.3 6432227.5
** BUILDING CRN 383557.3 6432252.0
** BUILDING BLD 30 1 0 15.24 4
** BUILDING IDN BLD30
** BUILDING NAM N of SMP Bldg
** BUILDING CRN 383474.1 6432257.2
** BUILDING CRN 383474.1 6432251.8
** BUILDING CRN 383506.9 6432251.8
** BUILDING CRN 383506.9 6432257.2
** BUILDING BLD 31 1 0 12.2 4
** BUILDING IDN BLD31
** BUILDING NAM S of SMP Bldg
** BUILDING CRN 383465.7 6432227.5
** BUILDING CRN 383465.7 6432216.3
** BUILDING CRN 383509.2 6432216.3
** BUILDING CRN 383509.2 6432227.5
** BUILDING BLD 32 1 0 17.61 4
** BUILDING IDN BLD32
** BUILDING NAM Rock Bin
** BUILDING CRN 383339.5 6432209.3
** BUILDING CRN 383339.3 6432159.5
** BUILDING CRN 383559.9 6432159.3
** BUILDING CRN 383560.1 6432209.5
** BUILDING BLD 33 1 0 4.5 4
** BUILDING IDN BLD33
** BUILDING NAM N of SMP bldg
** BUILDING CRN 383441.9 6432279.8
** BUILDING CRN 383441.9 6432268.2
** BUILDING CRN 383483.5 6432268.2
** BUILDING CRN 383483.5 6432279.8
** BUILDING BLD 34 1 0 4.5 6
** BUILDING IDN BLD34
** BUILDING NAM N of SMP bldg
** BUILDING CRN 383523.0 6432273.8
** BUILDING CRN 383523.0 6432267.7
** BUILDING CRN 383549.2 6432267.7
** BUILDING CRN 383549.2 6432278.7
** BUILDING CRN 383528.8 6432278.7
** BUILDING CRN 383528.8 6432273.8
** BUILDING BLD 36 1 0 10 24
** BUILDING IDN BLD36
** BUILDING NAM SMP Tank
** BUILDING TNK 383418.3 6432262.8 5.0
** BUILDING BLD 37 1 0 10 24
** BUILDING IDN BLD37
** BUILDING NAM SMP tank
** BUILDING TNK 383405.7 6432263.0 5.0
** BUILDING BLD 38 1 0 10 24
** BUILDING IDN BLD38
** BUILDING NAM SMP tank
** BUILDING TNK 383391.4 6432260.7 7.9
** BUILDING BLD 39 1 0 10 24
** BUILDING IDN BLD39
** BUILDING NAM SMP tank
** BUILDING TNK 383374.6 6432260.7 7.9
** BUILDING BLD 40 1 0 19.8 4
** BUILDING IDN BLD40
** BUILDING NAM No 2 Receivals bin
** BUILDING CRN 383644.5 6432166.5
** BUILDING CRN 383644.5 6432109.9
** BUILDING CRN 383898.3 6432109.9
** BUILDING CRN 383898.3 6432166.5
** BUILDING BLD 41 1 0 21.34 6
** BUILDING IDN BLD41
** BUILDING NAM Super Bin
** BUILDING CRN 383595.4 6432265.1
** BUILDING CRN 383586.1 6432256.2
** BUILDING CRN 383586.1 6432223.5
** BUILDING CRN 383596.8 6432213.2
** BUILDING CRN 384148.9 6432213.7
** BUILDING CRN 384148.9 6432265.1
** BUILDING BLD 42 1 0 25.9 4
** BUILDING IDN BLD42
** BUILDING NAM N of Super Bin
** BUILDING CRN 383640.8 6432296.4
** BUILDING CRN 383640.8 6432265.1
** BUILDING CRN 383808.4 6432265.3
** BUILDING CRN 383808.4 6432296.6
** BUILDING BLD 43 1 0 10 4
** BUILDING IDN BLD43
** BUILDING NAM Cooling Tower 2
** BUILDING CRN 383826.7 6432615.2
** BUILDING CRN 383826.9 6432572.3
** BUILDING CRN 383840.7 6432572.3
** BUILDING CRN 383840.7 6432615.2
** BUILDING BLD 45 1 0 18.6 4
** BUILDING IDN BLD45
** BUILDING NAM Ammonia Proj Comp Shelter A
** BUILDING CRN 383768.4 6432597.3
** BUILDING CRN 383768.4 6432576.1
** BUILDING CRN 383798.6 6432576.1
** BUILDING CRN 383798.6 6432597.3
** BUILDING BLD 46 1 0 16 4
** BUILDING IDN BLD46
** BUILDING NAM Ammonia Proj Comp Shelter B
** BUILDING CRN 383798.9 6432596.8
** BUILDING CRN 383798.9 6432569.5
** BUILDING CRN 383815.5 6432569.5
** BUILDING CRN 383815.5 6432596.8
** BUILDING BLD 47 1 0 12 4
** BUILDING IDN BLD47
** BUILDING NAM N-S Pipe Rack
** BUILDING CRN 383791.2 6432715.1
** BUILDING CRN 383791.2 6432597.0
** BUILDING CRN 383798.6 6432597.0
** BUILDING CRN 383798.6 6432715.1
** BUILDING BLD 48 1 0 23.5 4
** BUILDING IDN BLD48
** BUILDING NAM Primary Reformer Bldg
** BUILDING CRN 383805.2 6432661.1
** BUILDING CRN 383805.2 6432647.6
** BUILDING CRN 383817.9 6432647.6
** BUILDING CRN 383817.9 6432661.1
** BUILDING BLD 49 1 0 18 4
** BUILDING IDN BLD49
** BUILDING NAM Ammonia Proj Structure B
** BUILDING CRN 383777.2 6432670.9
** BUILDING CRN 383777.2 6432656.3
** BUILDING CRN 383789.6 6432656.3
** BUILDING CRN 383789.6 6432670.9
** BUILDING BLD 52 1 0 11 4
** BUILDING IDN BLD52
** BUILDING NAM E-W Pipe Rack
** BUILDING CRN 383713.0 6432606.0
** BUILDING CRN 383713.0 6432600.0
** BUILDING CRN 383798.3 6432600.0

** BUILDING CRN 383798.3 6432606.0
** BUILDING BLD 53 1 0 5 24
** BUILDING IDN BLD53
** BUILDING NAM Ammonia Proj tank
** BUILDING TNK 383758.9 6432643.1 5.6
** BUILDING BLD 54 1 0 5 24
** BUILDING IDN BLD54
** BUILDING NAM Ammonia Proj tank
** BUILDING TNK 383743.8 6432641.2 4.0
** BUILDING BLD 56 1 0 14 4
** BUILDING IDN BLD56
** BUILDING NAM HAP Bldg
** BUILDING CRN 384289.4 6432179.2
** BUILDING CRN 384258.0 6432134.4
** BUILDING CRN 384291.5 6432111.5
** BUILDING CRN 384321.9 6432156.8
** BUILDING BLD 57 1 0 8.2 4
** BUILDING IDN BLD57
** BUILDING NAM CAP Control Room
** BUILDING CRN 384322.7 6432112.3
** BUILDING CRN 384315.2 6432100.1
** BUILDING CRN 384337.9 6432084.9
** BUILDING CRN 384345.6 6432096.6
** BUILDING BLD 58 1 0 7.9 4
** BUILDING IDN BLD58
** BUILDING NAM CAP Cell Bldg
** BUILDING CRN 384330.4 6432123.3
** BUILDING CRN 384323.5 6432112.1
** BUILDING CRN 384346.1 6432096.1
** BUILDING CRN 384354.1 6432107.5
** BUILDING BLD 59 1 0 9 6
** BUILDING IDN BLD59
** BUILDING NAM CAP Bldg
** BUILDING CRN 384344.0 6432141.9
** BUILDING CRN 384331.5 6432123.8
** BUILDING CRN 384354.4 6432108.1
** BUILDING CRN 384371.2 6432133.1
** BUILDING CRN 384360.3 6432139.8
** BUILDING CRN 384356.0 6432132.8
** BUILDING BLD 61 1 0 37.1 4
** BUILDING IDN BLD61
** BUILDING NAM S NaCN Solids Process Bldg
** BUILDING CRN 384442.9 6432097.4
** BUILDING CRN 384436.7 6432088.6
** BUILDING CRN 384447.1 6432081.7
** BUILDING CRN 384454.0 6432090.2
** BUILDING BLD 62 1 0 16.8 4
** BUILDING IDN BLD62
** BUILDING NAM NaCN Solids Process Bldg
** BUILDING CRN 384450.3 6432120.6
** BUILDING CRN 384438.1 6432101.4
** BUILDING CRN 384453.8 6432090.8
** BUILDING CRN 384467.1 6432110.2
** BUILDING BLD 63 1 0 13.8 4
** BUILDING IDN BLD63
** BUILDING NAM N NaCN Control
** BUILDING CRN 384415.9 6432092.1
** BUILDING CRN 384403.2 6432074.2
** BUILDING CRN 384410.1 6432069.7
** BUILDING CRN 384422.9 6432087.3
** BUILDING BLD 64 1 0 26 4
** BUILDING IDN BLD64
** BUILDING CRN 384426.3 6432084.9
** BUILDING CRN 384416.7 6432070.5
** BUILDING CRN 384436.7 6432056.4
** BUILDING CRN 384446.6 6432071.3
** BUILDING BLD 65 1 0 6 4
** BUILDING IDN BLD65
** BUILDING CRN 384425.8 6432063.3
** BUILDING CRN 384405.8 6432034.0
** BUILDING CRN 384411.9 6432030.0
** BUILDING CRN 384431.1 6432059.6
** BUILDING BLD 66 1 0 13.5 4
** BUILDING IDN BLD66
** BUILDING NAM Turbine Alt Bldg
** BUILDING CRN 384401.3 6432029.2
** BUILDING CRN 384390.6 6432014.0
** BUILDING CRN 384397.6 6432009.2
** BUILDING CRN 384408.5 6432024.7
** BUILDING BLD 67 1 0 5 6
** BUILDING IDN BLD67
** BUILDING NAM CAP area bldg
** BUILDING CRN 384379.4 6432185.0
** BUILDING CRN 384369.1 6432170.4
** BUILDING CRN 384373.5 6432167.3
** BUILDING CRN 384382.3 6432180.4
** BUILDING CRN 384390.1 6432174.7
** BUILDING CRN 384391.7 6432177.1
** BUILDING BLD 68 1 0 5 4
** BUILDING IDN BLD68
** BUILDING NAM CAP area bldg
** BUILDING CRN 384380.9 6432178.0
** BUILDING CRN 384377.7 6432173.2
** BUILDING CRN 384398.6 6432159.0
** BUILDING CRN 384402.1 6432164.0
** BUILDING BLD 69 1 0 5 4
** BUILDING IDN BLD69
** BUILDING NAM CAP area bldg
** BUILDING CRN 384408.3 6432166.0
** BUILDING CRN 384401.9 6432157.0
** BUILDING CRN 384417.2 6432145.9
** BUILDING CRN 384423.6 6432155.5
** BUILDING BLD 10 1 0 6.4 8
** BUILDING IDN BLD10
** BUILDING NAM Chlorine Despatch Bldg
** BUILDING CRN 384370.9 6432123.2
** BUILDING CRN 384362.4 6432111.4
** BUILDING CRN 384383.2 6432097.0
** BUILDING CRN 384374.8 6432084.1
** BUILDING CRN 384366.9 6432090.0
** BUILDING CRN 384358.2 6432076.6
** BUILDING CRN 384373.7 6432067.0
** BUILDING CRN 384399.2 6432103.8
** BUILDING BLD 44 1 0 24.4 4
** BUILDING IDN BLD44
** BUILDING NAM Top of SMP Bldg
** BUILDING CRN 383375.1 6432252.0
** BUILDING CRN 383375.1 6432227.3
** BUILDING CRN 383509.5 6432227.3
** BUILDING CRN 383509.5 6432252.0
** BUILDING BLD 60 1 0 15 24
** BUILDING IDN BLD60
** BUILDING NAM SMP tank
** BUILDING TNK 383350.2 6432262.1 10.0
** BUILDING BLD 70 1 0 19.5 4
** BUILDING IDN BLD70
** BUILDING NAM Nitric Acid Plant
** BUILDING CRN 383574.3 6432504.1
** BUILDING CRN 383574.3 6432499.2
** BUILDING CRN 383630.6 6432499.4
** BUILDING CRN 383630.6 6432504.2
** BUILDING BLD 71 1 0 18 6
** BUILDING IDN BLD71
** BUILDING NAM Ammonia Project Structure A
** BUILDING CRN 383742.8 6432630.6
** BUILDING CRN 383742.8 6432619.1
** BUILDING CRN 383736.8 6432619.1
** BUILDING CRN 383736.8 6432606.0
** BUILDING CRN 383755.3 6432606.0
** BUILDING CRN 383755.3 6432630.8
** BUILDING BLD 72 1 0 18 4
** BUILDING IDN BLD72
** BUILDING NAM Ammonia Proj Structure S of reformer
** BUILDING CRN 383804.0 6432641.9
** BUILDING CRN 383804.0 6432605.2
** BUILDING CRN 383820.0 6432605.2

** BUILDING CRN 383820.0 6432641.9
** BUILDING BLD 73 1 0 24 24
** BUILDING IDN BLD73
** BUILDING NAM V3001
** BUILDING TNK 383785.1 6432681.0 1.85
** BUILDING BLD 74 1 0 46 24
** BUILDING IDN BLD74
** BUILDING NAM V3008
** BUILDING TNK 383784.9 6432675.1 1.7
** BUILDING BLD 75 1 0 10.9 4
** BUILDING IDN BLD75
** BUILDING NAM Ammonia Proj Elec & Tech
** BUILDING CRN 383728.5 6432587.5
** BUILDING CRN 383728.3 6432572.8
** BUILDING CRN 383751.1 6432572.8
** BUILDING CRN 383751.1 6432587.3
** BUILDING BLD 0 0 0 19.4 4
** BUILDING IDN BLD76
** BUILDING NAM Nitric Acid Plant 1b
** BUILDING CRN 383608.0 6432582.0
** BUILDING CRN 383608.0 6432572.0
** BUILDING CRN 383631.5 6432572.1
** BUILDING CRN 383631.4 6432582.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD77
** BUILDING NAM Nitric Acid Plant 2b
** BUILDING CRN 383611.0 6432588.0
** BUILDING CRN 383611.0 6432583.0
** BUILDING CRN 383616.1 6432583.0
** BUILDING CRN 383616.1 6432588.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD78
** BUILDING NAM Nitric Acid Plant 3b
** BUILDING CRN 383602.0 6432567.0
** BUILDING CRN 383602.0 6432555.0
** BUILDING CRN 383609.1 6432555.0
** BUILDING CRN 383609.1 6432567.0
** BUILDING BLD 0 0 0 19.5 5
** BUILDING IDN BLD79
** BUILDING NAM Nitric Acid Plant 4b
** BUILDING CRN 383580.1 6432566.0
** BUILDING CRN 383580.1 6432554.0
** BUILDING CRN 383588.5 6432554.0
** BUILDING CRN 383588.5 6432566.0
** BUILDING CRN 383580.0 6432566.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD80
** BUILDING NAM Nitric Acid Plant b
** BUILDING CRN 383584.3 6432572.0
** BUILDING CRN 383584.3 6432567.0
** BUILDING CRN 383640.6 6432567.0
** BUILDING CRN 383640.6 6432572.0
** BUILDING BLD 0 0 0 55 4
** BUILDING IDN BLD81
** BUILDING NAM PP2 Structure
** BUILDING REC 383908.6 6432585.1 8.0 10.0 0.0
** BUILDING BLD 0 0 0 62 4
** BUILDING IDN BLD82
** BUILDING NAM PP2 Tower
** BUILDING REC 383897.8 6432585.1 10.5 10.5 0.0
** BUILDING BLD 0 0 0 15 4
** BUILDING IDN BLD83
** BUILDING NAM PP2 Storage
** BUILDING REC 383934.3 6432573.6 32.0 36.0 0.0
** BUILDING BLD 0 0 0 37 24
** BUILDING IDN BLD3
** BUILDING NAM 30K NH3 Tank
** BUILDING TNK 383509.6 6432683.1 25.0
** BUILDING BLD 0 0 0 30 24
** BUILDING IDN BLD13
** BUILDING NAM 10K NH3 Tank
** BUILDING TNK 383499.0 6432616.5 15.0
** BUILDING BLD 0 0 0 10 4
** BUILDING IDN BLD35
** BUILDING NAM NAP3 Cooling tower
** BUILDING REC 383709.5 6432647.6 30.0 12.0 0.0
** BUILDING BLD 0 0 0 19.4 4
** BUILDING IDN BLD50
** BUILDING NAM NAP3a
** BUILDING REC 383629.9 6432651.8 25.0 10.0 0.0
** BUILDING BLD 0 0 0 19.4 4
** BUILDING IDN BLD51
** BUILDING NAM NAP3b
** BUILDING REC 383648.2 6432646.0 5.0 5.0 0.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD55
** BUILDING NAM NAP3c
** BUILDING REC 383655.6 6432667.8 7.0 12.0 0.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD84
** BUILDING NAM NAP3d
** BUILDING REC 383676.6 6432668.9 10.0 10.0 0.0
** BUILDING BLD 0 0 0 19.5 4
** BUILDING IDN BLD85
** BUILDING NAM NAP3e
** BUILDING REC 383623.6 6432663.1 56.0 5.0 0.0
** BUILDING BLD 0 0 0 15.5 4
** BUILDING IDN BLD86
** BUILDING NAM PP2a
** BUILDING REC 384023.9 6432573.3 136.0 50.0 0.0
** BUILDING BLD 0 0 0 9 4
** BUILDING IDN BLD87
** BUILDING NAM PP2b
** BUILDING REC 384023.9 6432623.3 60.0 10.0 0.0
** BUILDING BLD 0 0 0 9 4
** BUILDING IDN BLD88
** BUILDING NAM PP2c
** BUILDING REC 384023.9 6432633.3 53.0 15.0 0.0
** BUILDING BLD 0 0 0 9.5 4
** BUILDING IDN BLD89
** BUILDING NAM PP2d
** BUILDING REC 384023.7 6432648.3 75.0 35.0 0.0
** BUILDING BLD 0 0 0 26.3 4
** BUILDING IDN BLD90
** BUILDING NAM PP2e
** BUILDING REC 384023.9 6432625.1 7.0 7.0 0.0
** BUILDING BLD 0 0 0 17.5 4
** BUILDING IDN BLD91
** BUILDING NAM PP2f
** BUILDING REC 384025.8 6432632.1 4.5 16.2 0.0
** BUILDING BLD 0 0 0 17.5 4
** BUILDING IDN BLD92
** BUILDING NAM PP2g
** BUILDING REC 384023.7 6432648.3 7.0 7.0 0.0
** BUILDING BLD 0 0 0 25.8 4
** BUILDING IDN BLD93
** BUILDING NAM PP2h
** BUILDING REC 384046.1 6432626.1 9.0 9.0 0.0