Industry Sector:

Asphalt Manufacturing Industry

April 2001

Compliance Performance Report

ENVIRONMENT PROTECTION AUTHORITY

This *Compliance Performance Report — Industry Sector: Asphalt Industry* was prepared by Compliance Audit Section, NSW Environment Protection Authority.

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EXECUTIVE SUMMARY

As part of the EPA industry sector based Compliance Audit Program, compliance audits were undertaken at 17 licensed asphalt manufacturing premises across New South Wales. The objective of the audits was to assess each enterprise's compliance with the current statutory instruments issued to the premises and with EPA Acts and regulations, and to outline a program for follow-up action to address instances of non-compliance and improve environmental performance. This report is based on a collation of these audit findings. It provides an insight into the industry's overall compliance performance as well as a summary of issues of environmental concern identified during the audits.

The procedures and protocols for conducting each audit are detailed in the EPA Compliance Audit Handbook. Assessment of compliance at each premise was undertaken by a detailed site inspection and review of records and documentation relating to the premises. Officers of the EPA carried out the audits between August 1999 and June 2000.

The 17 asphalt manufacturing premises that were audited are out of a total of 35 premises licensed State-wide. They were selected from across New South Wales and ranged from small to large scale operations. It is likely that issues identified in this representative sample of asphalt manufacturing premises are generally typical of the whole sector.

While the industry had relatively few compliance issues identified in relation to the fulfilment of legislative requirements such as monitoring and administrative requirements, there were a number of areas where the compliance and environmental performance of the industry were identified as needing improvement.

Based on the EPA audits, prevalent issues across the industry requiring attention are:

- proper design; operation and maintenance of air and water pollution control plant and equipment;
- ensuring spillages of liquid or material are contained and promptly cleaned up;
- providing containment around all liquids and materials that have the potential to cause pollution of water or land; and
- the overheating of bitumen.

While the EPA, through a systematic and rigorous process of follow up action programs, ensures that these particular issues are being addressed at the audited sites, they are likely to be of concern at any premises undertaking asphalt manufacture and warrant an ongoing focus by site management at all sites.

The EPA will use the findings of the sector report to review how best its resources could be channelled to guide industry to address the issues identified in the report. This will include considering the use of regulatory tools such as licence conditions and enforcement, as well as additional tools such as policy documents, education and consultation/negotiation.

It is also hoped that the report will be of benefit to the industry and local government in understanding and managing the environmental and business risk of operating in the asphalt manufacturing industry. Key issues identified from the audits are listed below.

Delivery and handling of bitumen, diesel and other chemicals

- Spillages that occurred during the cleaning of bitumen transfer lines (using organic solvents such as diesel), and spillage of bitumen and diesel during delivery were not cleaned up, and caused or had the potential to cause soil and/or stormwater contamination.
- Diesel and other chemicals were handled in an uncontained area, with the potential to cause contamination of soil and stormwater runoff.

Delivery and handling of fine materials

- Spillages of fine aggregate material that occurred during delivery were not cleaned up, resulting in or increasing the likelihood of dust emissions and contamination of stormwater runoff.
- Failure to use dust control measures during truck loading and unloading of fine material increased the potential for excessive dust emissions.

Storage of hydrocarbons and other chemicals

- Inadequate containment of hydrocarbons and other chemicals due to insufficient capacity of bunds, lack of an impervious base, damage to bund walls and non-removal of spilt liquids inside bunds, resulted in or increased the likelihood of stormwater contamination.
- Failure to monitor the integrity of underground storage tanks containing diesel increased the potential for soil and groundwater contamination to go undetected.

Storage of aggregate materials

- Insufficient containment of stockpiles and storage bins containing aggregate materials resulted in or increased the likelihood of stormwater contamination and excessive dust emissions.
- Stockpiles of fine aggregate material were not kept damp to minimise dust emissions.

Heating of aggregate and bitumen

- Exceedances of the specified limit on temperature of stored bitumen products increased the likelihood of volatile organic compound emissions to the air.
- Liquid fuel burners used to heat aggregate and bitumen were not properly maintained, with the potential to cause pollution of air, water and soil.

Control of airborne particulate matter from the manufacturing process

- Poor maintenance of pollution control equipment such as cyclones, baghouses and wet scrubbers resulted in emission of particulate matter to the air.

Management of waste water and stormwater runoff

- Waste water and/or stormwater runoff was not adequately treated prior to discharge, due to lack of maintenance and insufficient capacity of contaminated water treatment systems (first flush interceptor, sedimentation pit, triple interceptor pit, wastewater sump, septic tank, sludge-settling pond, pumps).
- Stormwater bypass of treatment systems increased the likelihood that contaminated stormwater would not be adequately treated before discharge.

Management of wastes

- The method of disposal of fine material was likely to cause dust emissions.

Control of dust on unsealed roads and areas

- Inadequate control of dust on unsealed roads and other unsealed areas resulted in excessive dust emissions from the premises.

Monitoring requirements

- Inadequate monitoring of groundwater and water discharges, with the potential for pollution of waters to go undetected.
- Air monitoring devices were not operating, with the potential for air pollution to go undetected.

Legislative requirements

- Pollution of surface waters caused by contaminants in discharges, and pollution of groundwater arising from diesel contamination of soil.

Administrative requirements

- Failure to formally advise the EPA of employees who were authorised to speak on behalf of the licensee or to provide information required by the licence.
- Failure to provide documentation, including Certificates of Compliance and an Environmental Management Plan, to the EPA within the required time frame (note that Statements of Compliance are now required as part of the licensee's Annual Return).

INTRODUCTION

This report presents the key findings from compliance audits on a sample of asphalt manufacturing premises across New South Walls. These premises are regulated by statutory instruments issued under environmental legislation administered by the EPA.

The EPA expects that the asphalt manufacturing industry will use this report to identify areas in which it can improve its overall level of compliance. It is also expected that the report will be used to improve the overall environmental performance of the sector and of individual premises within it. To assist with this, the EPA will be presenting the findings of the Industry Sector Compliance Audit Program to relevant peak industry bodies. The EPA will also appoint a sector review manager, who, with input from relevant stakeholders, will consider the issues identified by the audits that were found to be prevalent across the industry.

This report has been prepared for the purpose described and no responsibility is accepted for its use in any other context or for any other purpose.

Selection for audit

Industry sectors targeted in the EPA's Industry Sector Compliance Audit Program are selected based on an assessment of community and environmental concerns and EPA corporate objectives and strategies. Individual premises within the industry sector are selected for audit in consultation with EPA regional offices to get a representative sample of the sector.

Methodology

EPA compliance audits were performed on the selected premises in accordance with the procedures and protocols in the EPA Compliance Audit Handbook (copies of the Handbook are available by phoning the EPA Pollution Line on 131 555). The audits were limited to a review of each enterprise's compliance with legislation administered and statutory instruments issued by the EPA.

When an audit is completed, the findings are presented to the enterprise as an individual compliance audit report. These reports are based on information from the EPA's files, information supplied by the enterprise and observations made during site inspections undertaken between August 1999 and June 2000. The reports contain a plan of action, with recommendations on what must be done within an agreed time period by each enterprise to comply with the licence conditions. Further observations are also made that relate to potential instances of non-compliance and areas where enterprises can improve their environmental performance.

EPA regional offices follow up to ensure that the enterprise is implementing the actions required of it in the audit report. The EPA has a systematic and rigorous monitoring program that tracks these follow-ups to ensure that all actions are completed by the enterprise. All of the individual compliance audit reports are publicly available in the EPA Library at Level 15, 59-61 Goulburn Street, Sydney. The findings presented in this report are a collation of the findings presented in the individual compliance audit reports listed in the Appendix.

Description of the industry

Bitumen pre-mix or hot-mix industries are defined under Schedule 1 of the *Protection of the Environment Operations Act 1997* as:

Industries where crushed or ground rock is mixed with bituminous or asphaltic materials and that have an intended production capacity of more than 150 tonnes per day or 30 000 tonnes per year. This activity does not include works of a temporary nature exclusively providing product for a construction site and located on or adjacent to that site for a period of less than 12 months.

As at June 2000, there were 35 bitumen pre-mix or hot-mix licences in force in New South Wales. All of the premises audited were scheduled activities requiring licences under the POEO Act.

Local councils are the Appropriate Regulatory Authority (ARA) for mobile asphalt plants. No mobile asphalt plants were audited as part of this compliance audit program. It should be noted that a mobile asphalt plant providing product for a construction site and located on or adjacent to that site for a period of more than 12 months is no longer considered to be mobile or temporary as defined by the POEO legislation. Such plants will require an EPA licence if they have an intended production capacity of more than 150 tonnes per day or 30 000 tonnes per year.

Asphalt manufacturing

The asphalt manufacturing process consists of drying and heating aggregate (crushed rock, gravel, reclaimed asphalt pavement or sand) and filler (dust, fly-ash, lime or baghouse fines) and combining them with approximately 5% by weight of heated bitumen. Bitumen is a hydrocarbon that solidifies at ambient temperatures and acts as a binder in asphalt. The premises audited consisted of either of two types of asphalt manufacturing plants: batch plants, in which heated aggregate is transferred to a separate mixer (pugmill) and combined with filler and bitumen, and drum-mixing plants, in which the drying, heating and mixing of aggregates with bitumen occurs in a single operation in a drum mixer.

In batch plants, aggregate is fed via a conveyor belt to a mixer that removes moisture and heats the aggregate. The heated aggregate then passes through vibrating screens and is weighed before being dropped into a pugmill. The pugmill has paddle arms that rotate in opposite directions to mix together aggregate and pre-heated bitumen, thus forming hot asphalt.

In drum-mixing plants, aggregate is fed into the front of a drum mixer near the burner that heats and dries the aggregate. Pre-heated bitumen is applied directly to the aggregate towards the exit of the drum mixer to form hot asphalt.

Particulate emissions generated from batch or drum-mixing plants are typically collected in a cyclone followed by a baghouse or wet scrubber. Particle-laden air is directed into the top of a cone-shaped cyclone in such a way that the air flows in a downward spiral along the inside of the cyclone wall, causing larger sized particles to fall out of the gas stream. These particles are generally reused as a filler in the manufacturing process. Air emissions from the cyclone are ducted to either a baghouse or a wet scrubber for further extraction of finer sized particulate matter. A baghouse is an arrangement of fabric bag filters in which particle-laden air is sucked or forced from one side of the bags to the other, trapping particles on the fabric. In a wet scrubber, water is sprayed through the particle-laden airstream causing particles to be absorbed by the water and removed from the airstream. The water is collected in a sludge pit for removal of sediment and subsequent reuse in the wet scrubber.

The audited premises

The batch manufacturing process was used at 13 of the 17 premises audited, and the drum-mixing process at the remaining 4. The scales of operation of the premises audited are detailed in Table 1.

Table 1 Scales of operation of audited premises

Intended production capacity (kilotonnes per annum)	No of premises audited
0 to 30	3
>30 to 100	7
> 100	6
Total	16*

* One licence has been surrendered since the completion of the audit.

EPA regions are shown in Figure 1. Details of the number of asphalt manufacturing industries licensed in each EPA region and the number of audits carried out in each region as at June 2000, are presented in Table 2.

Figure 1 EPA regions

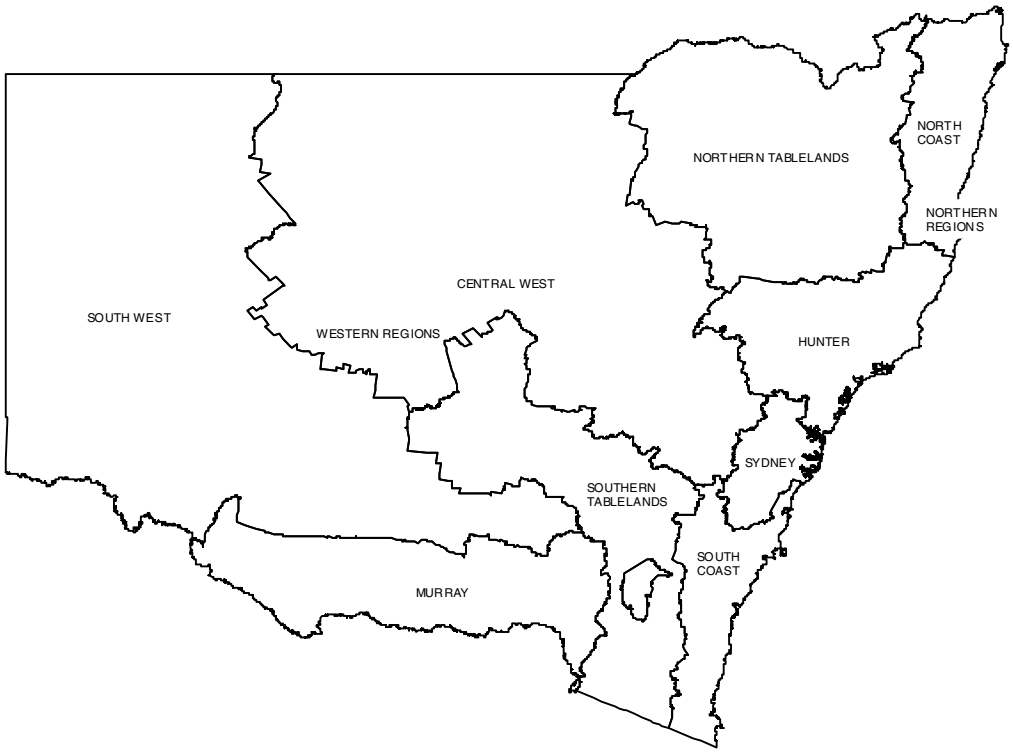

Table 2 Licensed and audited premises in each EPA region (at June 2000)

Region	Licensed	Audited
Sydney	11	5
South Coast	5	1
Hunter	10	5
North Coast	2	2
Central West	3	2
Northern Tablelands	2	1
Southern Tablelands	1	1
Murray	1	0
South West	0	0
Total	**35**	**17**

Statutory instruments issued to the premises

The Pollution Control Act 1970, *Clean Waters Act 1970, Clean Air Act 1961* and *Noise Control Act 1975* were replaced by the *Protection of the Environment Operations Act 1997* (POEO Act) on 1 July 1999.

Before 1 July 1999, the EPA licensed bitumen pre-mix or hot-mix (asphalt manufacturing) premises in New South Wales under the *Pollution Control Act 1970*. The *Protection of the Environment Operations (Savings and Transitional) Regulation 1998* deems all existing licences issued under the *Pollution Control Act 1970* to be licences under the POEO Act. At June 2000, there were 35 bitumen pre-mix or hot-mix licences in force in New South Wales. All of the premises audited were scheduled activities requiring licences under the POEO Act.

Approvals to install, construct or modify pollution control equipment or works were issued to four of the premises audited. Notices modifying licence conditions were also issued to four of the premises audited. These Pollution Control Approvals and notices were issued before 1 July 1999, under the *Pollution Control Act 1970*. Compliance with the approvals and notices was assessed in individual premises compliance audits.

Pollution Control Approvals are no longer required under the Protection of the Environment Operations Act. If a previously issued approval does not relate to work for which a licence is required under the POEO Act it ceased to have effect on 1 July 1999. (A licence is required for a scheduled activity or scheduled development work that will enable a scheduled activity to be carried out.) However, all other approvals are still valid under the POEO Act until 1 July 2001.

Notices issued under the *Pollution Control Act 1970* are also still valid under the POEO Act. Notices that can be issued under the POEO Act include environmental protection notices, notices for variation of licence, and notices for a breach of licensing requirements.

AREAS OF CONCERN

This report summarises the areas of concern identified from the 'non-compliances' and 'further observations' given in the individual compliance audit reports.

Non-compliances are reported where there is clear evidence of a breach of licence conditions. Where an issue of environmental concern is observed that does not strictly relate to the scope of the audit or assessment of compliance, the issue is reported as a further observation. Further observations are indicators of potential non-compliances or areas where environmental performance may be improved. The areas of concern identified during the audits are presented in Table 3.

The compliance of each premise with the conditions attached to the statutory instruments issued to them and with environmental legislation administered by the EPA, is described in the individual compliance audit reports, which are publicly available form the EPA Library at Level 15, 59-61 Goulburn Street, Sydney.

Table 3 Concerns and issues identified in the audits, and the number of premises at which they were identified (out of a total of 17 audited premises)

Area of concern	Issue	Premises
Operational activities	Storage of hydrocarbons and other chemicals	14
	Management of waste water and stormwater runoff	13
	Delivery and handling of bitumen, diesel and other chemicals	11
	Storage of aggregate materials	10
	Delivery and handling of fine materials	9
	Control of airborne particulate matter from the manufacturing process	9
	Heating of aggregate and bitumen	8
	Management of wastes	7
	Control of dust from unsealed roads and areas	2
Monitoring requirements	Monitoring of groundwater and water discharges	2
	Monitoring of air emissions	2
Legislative requirements	Pollution of waters	4
	Pollution Control Approval	1
Administrative requirements	Informing the EPA of authorised employees	10
	Providing information to the EPA	6
	Producing records to an EPA officer	1

Operational activities

Delivery and handling of bitumen, diesel and other chemicals

Bitumen, diesel and other chemicals are delivered to asphalt manufacturing plants by bulk tankers. These materials are transferred by way of transfer hoses and pipes. Upon completion of transfer the bitumen transfer hoses are generally cleaned out using an organic solvent such as diesel to prevent bitumen solidifying and blocking the lines.

Any spillage that occurs during the delivery or cleaning operations has the potential to cause contamination of soil and/or contamination of stormwater runoff that comes into contact with spilt liquids or contaminated soil. Delivering bitumen to storage tanks and loading hot asphalt into transfer bins are also likely to generate emissions of hydrocarbons to the air. Bitumen,

diesel and other chemicals were not delivered or handled in a proper and efficient manner at 11 of the 17 premises audited:

- Spillages that occurred during the cleaning of bitumen transfer lines and spillage of bitumen and diesel during delivery were not cleaned up, and caused or had the potential to cause soil and/or stormwater contamination (9 of the 17 premises).
- The application of release agents was not undertaken within a contained area, with the potential to contaminate soil and stormwater runoff (1 of the 17 premises).
- Spillage of diesel from bowsers in an area without containment had the potential to contaminate soil and stormwater runoff (2 of the 17 premises).
- Visible emissions during loading of hot asphalt into transfer bins may have indicated pollution of air (1 of the 17 premises).

Where possible, operators should undertake delivery and handling of bitumen, diesel and other chemicals within a contained (bunded) area. Operators must immediately clean up any spillages that occur.

Delivery and handling of fine materials

The delivery and handling of fine materials such as sand, dust and lime has the potential to generate dust emissions. Dust that migrates off-site may cause pollution of waters and nuisance to local residents. Fine materials were not delivered or handled in a proper and efficient manner at 9 of the 17 premises audited:

- Spillages of fine material onto sealed areas that occurred during delivery were not cleaned up immediately into suitable receptacles or controlled by watering (5 of the 17 premises).
- High level alarms on storage silos to prevent overflow of fine materials during delivery were not operating (3 of the 17 premises).
- The end of a pneumatic delivery line was not capped following delivery of lime to the silo (2 of the 17 premises).
- An overflow pipe used to direct to ground level any overflow of fly ash from the silo during delivery was not in place (1 of the 17 premises).
- Inadequate dust control measures during truck loading and unloading operations and loading of fine materials into storage bins had the potential to generate excessive dust emissions (3 of the 17 premises).

In order to minimise dust emissions, operators must employ appropriate dust control measures and immediately clean up any spillages that occur during delivery and transfer operations.

Storage of hydrocarbons and other chemicals

Hydrocarbons such as diesel and kerosene and other chemicals stored at asphalt manufacturing plants have the potential to cause contamination of soil and stormwater runoff. Hydrocarbons and other chemicals were not stored in a proper and efficient manner, and storage areas were not maintained in a proper and efficient manner at 14 of the 17 premises audited:

- Non-removal of spilt hydrocarbons and stormwater contaminated with hydrocarbons reduced the containment capacity of bunds around the storage tanks containing hydrocarbons and other chemicals, and increased or had the potential to increase the volume of contaminated stormwater requiring treatment (7 of the 17 premises).

- Damage to bunds around the storage tanks containing hydrocarbons and other chemicals reduced or had the potential to reduce the capacity of bunds to contain leaks and spills (5 of the 17 premises).
- Lack of containment around drums containing chemicals or chemical residue (5 of the 17 premises).
- Lack of containment around open drums used to collect spillages of hydrocarbons from transfer pipes (3 of the 17 premises).
- Storage tanks containing hydrocarbons and other chemicals were open at the top, thereby increasing the possibility of overflow during storm events (3 of the 17 premises).
- The integrity of underground storage tanks and associated pipes containing hydrocarbons was not monitored, with the potential for any leakages to result in hydrocarbon contamination of soil and groundwater (3 of the 17 premises).
- The base of a bunded area containing hydrocarbons and other chemicals was not impervious (2 of the 17 premises).
- Bunds around the storage tanks containing hydrocarbons and other chemicals that were too small or did not have lockable valves might not provide adequate containment in the event of a spillage (2 of the 17 premises).
- Drums containing hydrocarbons and other chemicals were corroded and had leaked (2 of the 17 premises).

Operators need to place vessels containing hydrocarbons such as diesel and kerosene and other chemicals within a bunded (contained) area. Bunds must be completely contained with an impervious base and must be large enough to contain a spillage from the largest vessel. Operators must remove spilt hydrocarbons from bunded areas to avoid increasing the volume of contaminated stormwater from bunds and unnecessarily increasing the load on water treatment systems. If operators choose to store hydrocarbons in underground storage tanks, monitoring the integrity of the tanks is required to detect any leakages and prevent hydrocarbon contamination of soil and groundwater.

Storage of aggregate materials

Materials stored in stockpiles or material storage bins at the audited sites included sand, dust, aggregate, pre-coated aggregate, coldmix, reclaimed asphalt pavement and waste asphalt. Stockpiles of fine materials such as sand and dust are likely to generate dust emissions, especially in dry, windy conditions, while uncontained stockpiles of pre-coated aggregate and coldmix have the potential to cause contamination of soil and water. Materials such as sand, dust, aggregate and pre-coated aggregate were not stored in a proper and efficient manner, and storage areas were not maintained in a proper and efficient manner, at 10 of the 17 premises audited:

- Uncontained stockpiles of pre-coated aggregate and coldmix had the potential to cause hydrocarbon contamination of soil and water (3 of the 17 premises).
- Fine material received at the premises was not stored in properly constructed bins (2 of the 17 premises).
- Stockpiles of fine material not contained in enclosures, or contained in enclosures without windshields or sprinklers, had the potential to generate excessive dust emissions during dry windy conditions (2 of the 17 premises).
- Material was allowed to bank-up against the windshields around the material storage bins (2 of the 17 premises).

- Hatches on material storage bins were not effectively sealed when not in use for routine inspection of material levels or maintenance (2 of the 17 premises).
- Poor maintenance of material storage bays allowed sand to escape and collect in a stormwater drain (1 of the 17 premises).
- Stockpiles of aggregate and pre-coated aggregate were not adequately contained, resulting in the spread of aggregate into adjacent bushland within the premises (1 of the 17 premises).

Operators should consider the local wind conditions when they plan the location of stockpiles, and must ensure that there are adequate dust controls in place to minimise dust emissions from stockpiled materials. In addition, stockpiles of pre-coated aggregate and coldmix need to be contained to prevent contamination of soil and water. Material storage bins must be constructed in such a way to capture dust emissions, for example with windshields, and must be adequately maintained to avoid escape of stored material.

Heating aggregate and bitumen

Overheating of bitumen causes emissions of odorous hydrocarbons to the air, while oil-fired burners used to heat aggregate and bitumen have the potential to cause pollution of air, soil and water if not properly maintained. Heating of aggregate and bitumen was not conducted in a proper and efficient manner, and heating equipment was not maintained in a proper and efficient manner, at 8 of the 17 premises audited:

- The temperature of material in the bulk storage tanks exceeded the specified limit for bitumen products (5 of the 17 premises).
- The temperature readout on the temperature gauges of bitumen storage tanks was not operating or was showing incorrect readouts, thereby increasing the possibility that temperature exceedances would not be detected (2 of the 17 premises).
- A diesel-fired burner was leaking diesel fuel (1 of the 17 premises).
- A burner was not self-proportioning and did not supply sufficient air for complete combustion of fuel (1 of the 17 premises).

Heating of aggregate and bitumen must be undertaken in a manner that minimises air emissions. Operators should maintain bitumen products at the minimum temperature possible for effective operation during the asphalt manufacturing process. This minimises odorous emissions, reduces heating costs and reduces the coking of bitumen. To minimise pollution of air, soil and water, burners must be adequately maintained and must be operated efficiently for complete combustion of fuel.

Airborne particulate matter

Plant and equipment such as screens, cyclones, baghouses and wet scrubbers are used to control air pollution by extracting particulate matter from plant emissions to the air. Of the 17 premises audited, 5 plants had wet scrubbers and 12 plants had baghouse filters for minimising particulate emissions. Particulate extraction equipment was not operated and maintained in a proper and efficient manner at 9 of the 17 premises audited:

- Baghouse failure or bypass was indicated by the accumulation of particulate matter at the base of the baghouse filters or at the discharge point (4 of the 17 premises).
- Holes in the cyclone, baghouse or wet scrubber were causing particulate matter to be expelled from the plant (3 of the 17 premises).
- The baghouse on the bitumen batching plant did not have an alarm or a system to automatically shutdown the plant in the event of baghouse failure (1 of the 17 premises).

- The collection efficiency of the wet scrubber was reduced by the supply of poor quality water (1 of the 17 premises).
- Visible emissions from the stack suggested that the collection efficiency of a wet scrubber might be poor (1 of the 17 premises).
- The specified concentration limit on discharge of particulate emissions from the baghouse stack was exceeded (1 of the 17 premises).

In order to minimise air pollution, operators must ensure that particulate extraction equipment is installed and is operated and maintained in a proper and efficient manner. In particular, operators must not exceed any limits set by licence conditions or by the *Clean Air (Plant and Equipment) Regulation 1997*. When specifying concentration limits on discharges the EPA considers the environmental effects of the discharge on the receiving environment. Any exceedance of a limit specified in an Environment Protection Licence could cause significant environmental harm, and is considered an offence under the *Protection of the Environment Operations Act 1997*.

Management of waste water and stormwater runoff

Water pollution control plant and equipment observed during the audits of asphalt manufacturing premises included first flush systems (used to collect the first pulse of contaminated stormwater runoff), sedimentation dams (used to retain sediment laden water on site in order to settle out suspended solids), oil-water separators and oil separator pits (used to remove oily material prior to discharge), diversion drains (used to separate clean water and dirty water), and bunds (used to contain materials that could cause pollution of waters). Surface water management and maintenance of surface water treatment systems was inadequate at 13 of the 17 premises audited:

- Maintenance of surface water treatment systems (sedimentation pit, triple interceptor pit, wastewater sump, septic tank, sludge-settling pond, pumps) was not adequate or may not be adequate to ensure that waters were treated to a standard suitable for discharge (8 of the 17 premises).
- The capacity of stormwater treatment systems to decontaminate stormwater runoff may be inadequate (6 of the 17 premises). Potential inadequacies due to the lack of a first flush system or poor maintenance of the first flush system were identified as an issue of environmental concern at 3 of the 17 premises audited.
- Stormwater was not treated or was inadequately treated before being discharged from the site (4 of the 17 premises).
- Bypass of contaminated stormwater around the appropriate treatment system may lead to a discharge of contaminated stormwater and pollution of waters (3 of the 17 premises).
- Kerbs used to direct hydrocarbon-contaminated stormwater to the treatment plant had been damaged and not repaired (1 of the 17 premises).
- The concrete lining of the outfall channel did not extend to the edges of the channel, with the potential to cause scouring of the channel (1 of the 17 premises).
- The stormwater treatment system may not be operated efficiently when the operator responsible for it is absent (1 of the 17 premises).

Operators must ensure that contaminated stormwater is directed to the appropriate surface water treatment system and that treatment systems have adequate capacity. Operators should implement plant monitoring and maintenance programs to ensure that the volume of contaminated water requiring treatment is kept to a minimum, and that stormwater treatment systems are serviced often enough to prevent buildup of sediment, oil and other water contaminants.

Management of wastes

Wastes generated at asphalt manufacturing premises have the potential to cause contamination of soil, water and air if not properly managed. Waste management was not undertaken in a proper and efficient manner at 7 of the 17 premises audited:

- The method of disposing of fine material collected from cleaning conveyor belts and bagfilters was likely to give rise to dust emissions (6 of the 17 premises).
- The operator did not have procedures in place for the reuse, recycling or disposal of a waste emulsion, with the potential for waste emulsion to be stored indefinitely at the site (1 of the 17 premises).

Operators must contain material that is removed during cleaning of the conveyor belt and bagfilters and must dispose of it in a manner that minimises dust emissions.

The waste emulsion stored at one of the premises was the product of a 'bad batch' of emulsion. It is important that operators identify ways to minimise the quantity of waste generated. Operators should also investigate options for the reuse, recycling or disposal of any wastes produced and should process each waste stream by the most appropriate method.

Control of dust from unsealed roads and areas

Dust that migrates off-site may cause pollution of waters and nuisance to local residents. Dust control on unsealed roads and other unsealed areas of the premises was inadequate at 2 of the 17 premises audited:

- Excessive dust emissions were generated from unsealed roads, due to a lack of dust control measures (1 of the 17 premises).
- The frequency of use of a water cart may not have been adequate to suppress dust at the premise (1 of the 17 premises).

Operators should use suitable methods of control to suppress dust from unsealed roads and other unsealed parts of the premises. They should promptly clean any spillages of aggregate and should keep traffic areas in good repair. Operators should locate all storage areas and plant requiring access by vehicles close together, so as to minimise the distance travelled by vehicles on unsealed roads. If feasible, operators should consider sealing all roads.

Monitoring requirements

Groundwater and water discharges

Monitoring groundwater and water discharges was inadequate at 2 of the 17 premises audited:

- Monitoring groundwater and water discharges was not adequate to ensure that the enterprise prevents pollution of waters (2 of the 17 premises).

Monitoring must be conducted as specified in an Environment Protection Licence. If there are no monitoring requirements on the licence, operators should determine the need for monitoring groundwater and water discharges, so as to comply with Section 120 (Prohibition of Pollution of Waters) of the *Protection of the Environment Operations Act 1997*.

Air emissions

Monitoring air emissions and maintaining air monitoring equipment was inadequate at 2 of the 17 premises audited:

- The obscuration meter on the baghouse exhaust was not operating at one premise, and may not have been operating accurately at another premise (2 of the 17 premises).

- The licensee did not understand the operation of the obscuration meter, obscuration levels and associated alarm system, causing concern that baghouse failure may not be detected (1 of the 17 premises).

Accurate monitoring of air emissions and interpretation of results allows the operator and the EPA to assess the effectiveness of pollution control equipment and the effect on the environment of activities carried out at a site. In particular, the obscuration system can alert the operator to a failure of the baghouse to adequately extract particulate matter from discharges to air.

Legislative requirements

Legislative requirements are the requirements placed on all operators by environmental legislation such as the *Protection of the Environment Operations Act 1997*.

Pollution of waters

Pollution of waters or the potential for pollution of waters was identified at 4 of the 17 premises audited. The following observations relate to breaches and potential breaches of Section 120 (Prohibition of Pollution of Waters) of the *Protection of the Environment Operations Act 1997*:

- Discharge waters that were contaminated by an on-site sewage treatment plant contained high concentrations of faecal coliforms (41,000 per 100mL) and enterococci (5,000 per 100mL) (1 of the 17 premises).
- Discharge waters contained high concentrations of suspended solids (200mg/L) (1 of the 17 premises).
- Discharge waters contained suspended solids and petroleum hydrocarbons (1 of the 17 premises).
- Hydrocarbon contamination of soil caused or had the potential to cause contamination of groundwater (2 of the 17 premises).

Operators should seek to minimise or prevent discharges from the premises, by separating clean and dirty waters for on-site treatment and/or reuse. Operators must ensure that any discharges from the premises do not pollute surface waters.

In order to prevent pollution of groundwater, operators must ensure that hydrocarbon contamination of soil does not occur. It is noted that in addition to the environmental concern over groundwater contamination that was reported at 2 sites, hydrocarbon contamination of soil was identified at a further 6 premises.

Pollution control approval

Failure to apply for Pollution Control Approval for modifications to pollution control equipment was identified at 1 of the 17 premises.

Under the *Clean Waters Act 1970*, operators were required to obtain a Pollution Control Approval before installing, altering or replacing plant and equipment that was likely to alter the level of pollution from the plant. It should be noted that Pollution Control Approvals are no longer required under the *Protection of the Environment Operations Act 1997*, however variations to the licence may be needed for certain works.

Administrative requirements

Informing the EPA of authorised employees

Failure to formally advise the EPA of the names and telephone numbers of those people authorised by the licensee to speak on behalf of the licensee or to provide information as required by the licence, was identified at 10 of the 17 premises.

This requirement has been removed from licences issued under the POEO Act. Licensees are now required to provide this information on their licence application form. If the EPA becomes aware of events that are causing or have the potential to cause environmental harm, the EPA can contact employees with delegated authority and thereby prevent or minimise environmental harm.

Providing information to the EPA

Failure to produce information to the EPA as required by conditions of the licence contributed to non-compliances at a total of 6 of the 17 premises audited:

- Certificates of Compliance (note that Statements of Compliance are now required as part of the licensee's Annual Return) and an Environmental Management Plan were not supplied to the EPA within the required timeframe (4 of the 17 premises).
- An air pollution event that constituted an exceedance of licence limits was not reported to the EPA (1 of the 17 premises).
- Stack emission test reports did not contain all of the reporting items required by Australian Standard test methods (1 of the 17 premises).
- The Licence Information Form submitted by the licensee did not contain any details of a discharge point that existed at the premises (1 of the 17 premises).

In order to effectively monitor environmental effects at a site, the EPA requires that information from licensees is provided within the required timeframe and contains all the information requested. Complete reporting of air emission monitoring from the stack allows the operator and the EPA to assess whether discharges to air were within limits specified in the licence or the *Clean Air (Plant and Equipment) Regulation 1997*.

Producing records to an officer of the EPA

Failure to produce records as required by conditions of the licence contributed to non-compliances at 1 of the 17 premises audited:

- The records of monitoring were not produced to an officer of the EPA who asked to see them (1 of the 17 premises).

Monitoring records and other records specified in the licence conditions are used by the licensee and the EPA to assess the effectiveness of pollution control equipment and the environment effect of activities carried out at a site.

WHERE TO FROM HERE?

Issues identified in the sample of 17 licensed asphalt manufacturing premises out of a total of 35 state-wide are likely to be generally typical of the whole sector. There were relatively few compliance issues identified in relation to the control of dust from unsealed roads and other unsealed parts of the premises, and fulfilment of legislative requirements other than licence requirements. There were no noise issues identified at any of the audited premises. Areas in which the industry needs to improve its compliance and environmental performance are:

- ensuring spillages of liquid or solid material are promptly cleaned up;
- providing containment around all liquids and materials that have the potential to cause pollution of air, water or land; and
- properly operating and maintaining air and water pollution control equipment.

While the EPA, through a systematic and rigorous process of follow-up action programs, ensures that these particular issues are being addressed at the audited sites, they are likely to be of concern at any premises undertaking asphalt manufacture and warrant an ongoing focus by site management at all sites.

The EPA recognises that reporting on the state of the asphalt manufacturing industry sector's environmental performance will be a valuable management tool. The EPA will therefore disseminate the information in this report to relevant stakeholders and seek cooperative opportunities to work with the industry to improve environmental performance in the asphalt manufacturing sector.

The EPA will also use the findings of this report to review how best it can channel its resources to guide industry to address the issues identified. The EPA will also appoint a sector review manager who will consider using a suite of tools in addition to regulatory instruments to address environmental issues that were found to be prevalent across the sector. The findings of this report will also be useful in the licence reviews required to be undertaken by the EPA under the *Protection of the Environment Operations Act 1997* (POEO Act).

REFERENCES

Australian Asphalt Pavement Association (1995) *Draft Code of Practice for Asphalt Manufacturing Plants.*

NSW Department of Urban Affairs and Planning (1996). *EIS Guideline—Bitumen Works*. Sydney, NSW.

Queensland Department of Environment and Heritage (1994) *Draft Environmental Guideline for Asphalt Manufacturing Plants*. Brisbane, Queensland.

Queensland Department of Environment and Heritage (1996) *Draft Operators' Compliance Guide for the Asphalt Manufacturing Plants*. Brisbane, Queensland.

WA Environmental Protection Authority (1991) *Environmental Code of Practice for Asphalt Plants.* Perth, Western Australia.

APPENDIX: LIST OF PREMISES AUDITED

The findings of this report are based on the results of compliance audits at:

- Astec Pty Ltd — Minto
- Boral Asphalt — Black Hill
- Boral Asphalt — Carrington
- Boral Asphalt — Coffs Harbour
- Boral Asphalt — Dubbo
- Boral Asphalt — Greystanes
- Boral Asphalt — Singleton
- Boral Asphalt — West Gosford
- CSR Emoleum Road Services — Kelso
- CSR Emoleum Road Services — Queanbeyan
- CSR Emoleum Road Services — Teralba
- CSR Emoleum Road Services — Wetherill Park
- Lismore City Council — Blakebrook
- Pioneer Road Services — Albion Park Rail
- Pioneer Road Services — Alexandria
- Pioneer Road Services — Eastern Creek
- Pioneer Road Services — Tamworth

Individual compliance audit reports for all of these facilities are publicly available from the EPA Library at Level 15, 59-61 Goulburn Street, Sydney.