Maribyrnong Stormwater Management Plan (2002) - Industry Audit Program Final Report

19 May 2003

Maribyrnong City Council

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Executive Summary

Stony Creek is an urban waterway collecting stormwater runoff from industrial and residential sources in West Metropolitan Melbourne, ultimately draining into the Yarra River. Within the jurisdiction of the Maribyrnong City Council (Council), Stony Creek is surrounded by an intense concentration of industry. Numerous industries have built up along the Stony Creek easement and surrounding areas in Tottenham and West Footscray and consequently any contaminants that may arise from industrial activities can easily make their way to the Creek.

In 2002 the Council produced their Stormwater Management Plan (SWMP), a strategic document used to guide the integration of stormwater management into their existing planning function. One of the key objectives of the Council's SWMP was to determine the values and beneficial uses of the receiving stormwater environments and to identify and manage any threats.

The Stony Creek catchment was identified as one of the main priorities requiring assessment and the Council determined that an industry audit was a useful mechanism to understand and identify stormwater management practices by local industry. Council applied to the Victorian Stormwater Action Program (VSAP) administered by the Environment Protection Authority (EPA), for funding to undertake the industry audit and successful.

Parsons Brinckerhoff (PB) was engaged by the Council to undertake the Industry Audit Program (Program) for a total of 69 sites representing a range of industries in the defined catchment area. The Stony Creek catchment area audited was confined to a triangular shaped region bordered by Sunshine Road to the north, Geelong Road to the east and a 'goods' railway line to the west. This segment of the Stony Creek catchment contains approximately 200 businesses. PB audited a number of businesses across a broad range of industries, namely: Automotive / Mechanical, Enclosed Warehousing Facilities, Distribution / Transport Depots, Manufacturing, Food Industry, Paints and Textiles, and Metal Works.

The aim of the Program was to identify the main threats to the stormwater quality entering Stony Creek from industry, and where appropriate provide recommendations to improve stormwater management.

A Steering Committee was formed between the Council, EPA and PB. The role of the Steering Committee was to manage and implement the Program. The Steering Committee met periodically to review the Program's progress and to resolve any issues as appropriate. One of the key aspects of the Program was disclosure of information gained by PB. The Steering Committee decided that the information gained during the Program was to remain the property of the Council and the individual participating companies. EPA would not be privy to the site specific information. By adopting this approach the Council hopes to build a working relationship with local industry to improve water quality in Stony Creek.

Each site was audited for a period of up to two hours. PB developed an audit questionnaire that was used at each site to ensure a consistent approach was adopted by each of the PB auditors. The questionnaire reflected six criteria for assessment, viewed as key indicators for sound stormwater management and commitment of the sites to minimising potential impacts on Stony Creek. These criteria were as follows:

- *Containment – Storage of liquid and solid wastes, raw materials and products in a manner that would not impact adversely on quality of stormwater flows from the site, including the appropriate application of EPA Bunding Guidelines (Publication 347);*
- *Housekeeping – Implementation of housekeeping standards appropriate to the size and nature of the site including general site cleanliness, availability of spill kits and material safety data sheets (MSDS), and the appropriate storage of incompatible chemicals;*
- *Maintenance – Appropriate maintenance of stormwater drains, stormwater collection and site discharge points, wastewater collection systems and the minimisation of leaks and spills from any operating equipment;*
- *Emergency Response Staff Resources – Ensuring that there were sufficient staff at the site to address emergency situations that threatened stormwater and that these people were appropriately trained'*
- *Procedures – Verifying that procedures appropriate to the size of the business had been developed to manage environmental aspects at the site and that the possible risks of impacts to the stormwater had been addressed; and*
- *Training and Awareness – The site had established a training and awareness raising program focused on sound stormwater management practices.*

At the completion of the Audit each site was provided with a report. This included:

- *Areas of concern including recommendations for improvement where appropriate. The recommendations issued to each business provided an action plan to improve stormwater management performance, and*
- *A risk assessment against each of the six criteria, using a performance / consequence format.*

The findings of the Program were highlighted by reviewing the performance of the participants against the risk assessment results and the recommendations made against each of the six criteria. The number of recommendations made against each of the criteria was also highlighted for each industry type.

PB made a total of 222 recommendations to participants of the Program.

- *Containment issues, where process and waste materials were stored inappropriately, required the largest number of recommendations. A total of 79 recommendations were made to 45 of the 69 sites visited. In a number of cases, large companies were referred to the EPA Bunding Guidelines (Publication 347) for improvement while smaller sites were often referred to bund pallets to address concerns;*
- *PB made a total of 50 recommendations in regard to general housekeeping. Housekeeping required improvement, generally more so at the smaller sites than the larger sites. Particular areas of concern included the lack of spill kits and use of inappropriate absorbent material, and the absence of material safety data sheets (MSDSs). MSDSs are informative documents that provide details on the hazards of chemicals and appropriate spill response measures;*
- *Maintenance required the least amount of improvement partly due to the proactive nature of companies to maintain their interceptor pits and partly due to the inaccessibility to stormwater*

drains on sites. PB made a total of 34 recommendations to improve the cleanliness of stormwater drains and maintenance of infrastructure at the sites. Larger industrial processing sites typically implemented equipment maintenance programs to minimise leaks and losses the stormwater; and

- *Emergency Response, Procedures and Training and Awareness were found to be interrelated and a total of 59 recommendations were made across these three criteria. The Program identified that smaller sites were not typically proactive in these areas. The smaller sites could improve by undertaking informal discussions with staff or posting of flyers around the workplace. At larger sites with chemical or manufacturing processes, more sophisticated training and emergency response procedures were adopted. Most of these sites had environmental management plans, of which stormwater was one aspect, and appropriate proactive measures were in place to raise awareness at the sites.*

PB's risk assessment process found that on average, industries within the catchment area were addressing the main threats to stormwater. However, the range of risk assessment scores also highlighted that there were poor performers within each industry group. Recommendations were made to improve each area where scores of low scores were obtained.

Subsequent to supplying each participating company with their site report, PB was engaged to undertake additional work. The focus of the additional work was to further communicate with industry participants regarding stormwater management and to monitor their thoughts and response to the Program. The scope of this work included both an industry workshop and selected follow-up site visits.

PB found that although a positive response was received to the direct invitation to attend the workshop, only a handful of participants attended on the day. Discussions with some companies during the follow-up audits revealed that they were unable to attend due to work commitments that subsequently arose on the day, or that they perceived that the workshop would not offer additional benefit to the report already received. This could be perceived as a disappointing result considering the positive response that PB had received to the Program during the initial site audits, however may also reflect that the initial site visits and reposts provided adequate detail for most participants.

Generally the response to the follow-up site visits was positive. Over half of the recommendations had been either completed or actioned and in a number of cases sites had completed all of the recommendations. In a couple of cases PB found that none of the recommendations had been actioned, however this mostly occurred where staff interviewed during the initial site visit were no longer employed by the company, or were not currently working at the site. The follow-up site visits provided a good impetus for ensuring ownership of the recommendations made to the sites were reassigned.

PB also prepared a general report outlining the methodologies employed and findings of the Program, which comprises this report. PB also made recommendations to Council to further develop stormwater management awareness in the Catchment Area and devise possible strategies to improving stormwater management in the catchment area. Discussion of these recommendations is provided below.

Recommendation 1

PB found that containment issues were typically site specific. PB informed these companies of the general requirement of EPA's Bunding Guidelines. To assist the implementation of these requirements PB feels that it would be beneficial to revisit some of the companies audited to assist them with this process.

- *Revisit 15 of the lowest scoring sites for containment and/or overall ratings, and give them site-specific guidance on improving bunding and other containment strategies for the site.*

Recommendation 2

Typically, housekeeping and general awareness of stormwater management issues required improvement across the participants involved in the audit. The audit program was useful for raising the awareness of stormwater management concerns confronting Stony Creek catchment and the general expectations of regulatory authorities. PB found that this information was well received and that there was general interest by companies to 'do the right thing'. To this end, PB foresees that additional awareness raising for businesses in the catchment area would be a benefit and that this may be achieved by holding an industry forum.

- *Hold an industry forum (workshop) for all the industry audit program participants and the greater industrial community in the catchment area. This workshop could focus on the general findings of the program and on improvements in identified areas such as bunding, housekeeping, and awareness raising of potential stormwater management issues at the sites.*

Recommendation 3

The Council is due to appoint a Neighbourhood Environment Improvement Plan (NEIP) Officer in the near future. The NEIP program is integral to the improvement of the general environment in the Council's jurisdiction and coupled with the Stormwater Management Plan provides a framework to progress stormwater management to a new level within the catchment. The audit is viewed as the commencement of a working relationship between Council and industry and should be proactively progressed by the NEIP Officer.

- *Council should utilise the audit program as the first step to building relationships with industry in the audit area, and through the NEIP Officer, develop visible and proactive contact with local industries.*

Recommendation 4

The audit program has identified a number of areas for the Council to direct its attention to improve the stormwater quality in the Stony Creek catchment. The audit program should be broadened to include all industries in the catchment area. It is noted that intensive industrial zones also exist upstream of the catchment area and consequently may also impact on Stony Creek. The Council should contact neighbouring Councils to widen the program to further reduce possible threats to the Stony Creek catchment.

- *Extend the audit program to all businesses in the catchment area and work with neighbouring Councils to Maribyrnong to address industrial threats from these areas. It is estimated that the auditing and reporting of audits for an additional 130 sites would take approximately 900 hours. This would include contacting sites, auditing (based on 4 sites per day), report summaries,*

analysis of data and a workshop. Risk assessment methodologies and audit protocols already produced could be used. This would, however, exclude producing a general summary report and any follow up audits.

Recommendation 5

The audit and follow-up site reviews has commenced an awareness-raising program for industrial companies within the catchment area, which provides a foundation for further education on stormwater management expectations of the Council.

- *Council should continue to promote useful information to industry to improve stormwater management. This could be managed by the NEIP Officer. In particular, follow-up site visits to the remaining companies that received recommendations would be beneficial. This would provide an impetus to the participants to continue to improve stormwater management and would provide recognition for the work performed in response to the Program. The NEIP Officer may also wish to consider issuing a formal certificate to all participants in recognition for their involvement in the Program.*

Recommendation 6

The largest number of recommendations made by PB involved issues relating to the containment criteria. A total of 79 recommendations, regarding containment, were made to 45 of the 69 sites visited during the Program. In a number of cases, containment was related to the installation of bunding or bunding improvements. Such site improvements may or may not have required notification to the Council and consequently it is difficult to monitor this threat to stormwater. This situation may have arisen because such activities were not identified in the first instance or sites altered their operations or practices without informing the Council.

- *Review planning mechanism to ensure that installation of all significant containment infrastructure is included in the Planning Approval process;*
- *Raise awareness of Train Urban Planning, Building Services, Infrastructure Planning, City Services and other relevant departments in the Council to recognise issues that could impact on the stormwater quality; and*
- *Undertake site inspection and enforcement action where appropriate.*

In conclusion PB found that the audit process and follow-up activities were valuable methods of identifying possible sources of stormwater contamination arising from local industrial activities, and raising awareness of sound stormwater management practices. PB would like to thank all industry participants in the Program for their openness and cooperation during the audits.

1. Introduction

1.1 Project Appreciation

Parsons Brinckerhoff (PB) was commissioned by the Maribyrnong City Council (Council) to undertake an Industry Audit Program (Audit) of a range of industries in Tottenham and West Footscray to identify the main threats to the stormwater quality entering Stony Creek, and to make recommendations to improve stormwater management at the industrial sites.

Stony Creek is an urban waterway collecting stormwater runoff from industrial and residential sources, ultimately draining into the Yarra River. The Stony Creek catchment area audited was confined to a triangular shaped region bordered by Sunshine Road to the north, Geelong Road to the east and a 'goods' railway line to the west (refer to Appendix A). In this segment of the Stony Creek catchment there is an intense concentration of industrial activity, the catchment contains approximately 200 businesses. These businesses cover a broad range of industry types, including large industrial manufacturers of paints, foodstuffs and textiles, warehousing and distribution facilities, and numerous small workshops and other industries.

The intense concentration of industry in the catchment area poses a risk to the quality of stormwater and consequently the health of Stony Creek. Numerous industries have built up along the Stony Creek easement and consequently any contaminants that may arise from industrial activities can easily make their way to the Creek. Historically the Council, Environment Protection Authority (EPA) and Melbourne Water have had various issues with industrial operators in the area and there is evidence to suggest that industrial practices have adversely impacted on the Creek.

In conjunction with Council and EPA, PB selected 69 businesses to be audited, across a broad range of industry types. Each of the industries was audited against targeted criteria, with a short report and a risk assessment prepared for each site, highlighting the main threats to stormwater quality and making recommendations for improvement. These site reports and risk assessments were supplied to each of the respective participating companies. In doing so, Council aims to improve the awareness of sound stormwater management practices in the catchment area, and commence a process of openly working with industry to improve the health of Stony Creek. A key aspect of the approach taken was to maintain confidentiality with each company. Reports were restricted to the individual company, a small group of council staff directly involved in the project and PB.

1.2 Background

In 2002 the Maribyrnong City Council produced their Stormwater Management Plan (SWMP), a strategic document used to guide the integration of stormwater management into their existing planning function.

The SWMP process is the product of a State Government initiative, supported by Melbourne Water, the EPA, and the Municipal Association of Victoria and led to the

formation of a 'Stormwater Agreement' between the three parties. Under this Agreement the Victorian Stormwater Action Program (VSAP) was formed. VSAP focused on improving stormwater management planning within the municipalities by offering funding to Councils for specific projects identified within the SWMPs.

One of the key objectives of the Council's SWMP was to determine the values and beneficial uses of the receiving stormwater environments and to identify and manage any threats.

The Stony Creek catchment area was identified as one of the main priorities requiring assessment due to the intense concentration of industrial activity in the area and concerns regarding the potential adverse impact on Stony Creek from local industry. The Council determined that an industry audit was a useful mechanism to understand and identify stormwater management practices in the catchment area.

The Council applied for VSAP funding to undertake the industry audit program and was successful in their application.

The SWMP supports a wider strategy to develop a Neighbourhood Environment Improvement Plan (NEIP). Neighbourhood Environment Improvement Plans are an EPA initiative, and are given effect by the *Environment Protection Act 1970.* The aim of the NEIP is to provide a framework for improvement of all environmental aspects of communities at the local level. Stakeholders in the NEIP process include local community members and businesses, as well as other State Government Authorities. Council was selected for one of three pilot programs for the NEIP process. The pilot program focuses on Stony Creek, of which stormwater quality was identified as one of the NEIP project areas. It is intended that the outputs from this Audit will be integrated into the NEIP process.

1.3 Industry Audit Scope of Work

The scope of work undertaken by PB was based on our proposal provided to council in July 2002 (PB Reference AKB 2130156 – P01a2130156).

PB subsequently worked closely with Council to further develop the scope of work to be completed under the Industry Audit program. The aim of the Industry Audit was to identify industrial stormwater management practices that could adversely impact on Stony Creek and to raise awareness of sound stormwater management practices. Consequently, a key objective of the audit scope was to visit as many businesses as possible.

The scope of work included:

- Identifying a range of businesses in the catchment area to include in the audit;
- Contacting identified businesses to seek their participation;
- Formulating an Audit Questionnaire to standardise the audit process;
- Developing a risk assessment process to rank the industries and identify issues of concern;

- Auditing a total of 69 businesses in the catchment area;
- Producing a short report and risk assessment for each business audited;
- Providing analysis of stormwater issues per industry type and possible practices that could adversely impact on Stony Creek; and
- Provision of a report (this report).

1.4 Report Purpose and Structure

The purpose of this report is to discuss the methodologies employed to undertake the Industry Audit Program and to outline the general findings of the audit. This report also makes recommendations to Council to further develop the awareness and performance of stormwater management practices by industry in the catchment area.

This report is divided into three sections, namely, 'Methodology', 'Discussion of Audit Results', and 'Recommendations', detailing the implementation and findings of the Audit Program. The content of these sections are outlined below:

1.4.1 Methodology

The 'Methodology' details the mechanics of the project. This section of the report contains the following components:

- **Steering Committee** – Discusses the formation of the Steering Committee and the role of each of the participants, namely Maribyrnong City Council, Environment Protection Authority and Parsons Brinckerhoff, and disclosure of information obtained during the audits;
- **Industry Selection Criteria** - Outlines the criteria used to select the industries audited and the assignment of industry groups to the business identified;
- **Engaging Participants** - Details the approach used to initially engage the identified companies in the audit program and the subsequent methodologies employed to obtain 69 companies;
- **Audit Protocol** - Outlines the development of the Audit Protocol used during the audits and the criteria used to assess stormwater management performance at each of the sites;
- **Site Inspections** – Describes the approach adopted by the auditing team to ensure consistency throughout the audit and the nature and style of the auditing process;
- **Risk Assessment** – Outlines the risk assessment process adopted and a description of the ratings assigned to the each site. It also discusses how the risk ratings should be interpreted by each of the sites;
- **Assessment and Reporting** – Describes the reports issued to the sites subsequent to the auditing process; and

- **Follow Up to Audit Program** – Outlines the approach adopted to following up the findings of the audit program.

1.4.2 Discussion of Audit Results

The "Discussion of Audit Results" details the findings of the Audit Program from inception to project completion. The following areas are discussed in the report:

- **Industry Audit Process** – Highlights the challenges and success of the methodologies used to engage companies in the Program. It also outlines the findings and successes of the audit process and the attitude of companies participating;
- **Risk Assessment Results** – Details the overall results of the risk assessment ratings for each of the six criteria, summarising the average score and score range for each. It also discusses the general findings of each of the six criteria, summarising the main issues found and any trends identified for each criteria;
- **Results by Industry Type** – Summarises the general findings of stormwater management performance in each of the industry sectors. It identifies any trends and the performance of the industry groups against each of the six criteria developed to assess the risk ratings for the sites; and
- **Follow Up Results** – Outlines the success of the follow up actions to the initial audit phase of the Program.

1.4.3 Recommendations

The Recommendations section of the report details a number of recommendations made to Council on the following topics:

- **Strategies to Abate Stormwater Risks** – Provides recommendations made to Council to further promote sound stormwater management practices at industrial sites in the catchment area; and
- **Sampling Program** – Provides recommendations made to Council concerning sampling and measuring water quality in Stony Creek.

2. Methodology

PB together with the Council and the Environment Protection Authority (EPA) formulated the following methodology for the Audit.

2.1 Steering Committee

A Steering Committee was formed at the commencement of the program and consisted of staff from Council, EPA and PB. The Steering Committee's role was to formulate the scope of the industry audit and to oversee the implementation of the program from inception to completion. Regular meetings were held between the three parties to steward the program.

In keeping with Councils commitment to working with industry, it was decided that the results of the audit findings for specific sites would remain confidential, including not being disclosed to EPA. Consequently, EPA did not attend Steering Committee meetings subsequent to the audits where specific sites were discussed. The Council and PB worked closely together throughout the entire project to ensure that the Audit achieved the desired outcomes.

The specific roles of the Steering Committee Members were as follows:

- Council was the Project Manager of the industry audit program and oversaw the implementation of the project. In this strategic role, Council outlined the key criteria by which the business would be audited and provided local knowledge of the area. Council was also responsible for contacting the audit participants and organising the audit schedule for the program;
- PB was contracted by the Council to undertake the audits and provide reports and analysis of their findings including a risk assessment. PB reported on the performance of the project at monthly meetings, providing updates on the general and site-specific findings as the program progressed; and
- EPA provided input into businesses that should be considered for inclusion in the audit and supplied information regarding the drainage network in the area. They also worked with the Council and PB to formulate strategies for engaging participants.

2.2 Industry Selection Criteria

The catchment area contains approximately 200 businesses. PB recognised through its previous work with other industry audit programs, including "Don't Let Your Business Go Down the Drain" and "Old Joe's Creek Waste Wise Automotive Project", that it would not be possible to review all 200 business within the financial scope of the program. Consequently, PB in consultation with the Council formulated five criteria to aid the selection of the industries to be included in the program. The criteria were as follows:

- One of the key objectives of the industry audit was to understand the potential impacts to Stony Creek from a range of industry types and sizes. After a review of

the different types of industries making up the businesses in the catchment area, seven significant groups were identified. An initial list of 75 sites was developed, representing a cross section of the seven groups, including key sites identified by EPA. The Audit groups were as follows:

- < Automotive/Mechanical;
- < Enclosed Warehousing Facilities;
- < Distribution/Transport Depots;
- < Manufacturing;
- < Food Industry;
- < Paints and Textiles; and
- < Metal Works.

- Companies whose property boundaries were adjacent to Stony Creek were also considered to be of high importance due to the potential immediate impact on the Creek from any discharges from the site;
- There are a number of street drains servicing large areas within the catchment that discharge directly into Stony Creek. Companies on streets that directly discharged to those drains were also considered in selection of the criteria;
- Any companies that historically had presented concerns to the Council;
- Any companies that historically had presented concerns to EPA; and
- Potentially high risk companies observed during PB's familiarisation of the catchment area.

Finally, PB sought to ensure that industries were selected so that a geographic spread across the identified areas was achieved.

2.3 Engaging Participants

Council undertook the process of engaging companies in the Audit. Companies contacted in the first instance were those identified during the industry selection process (as described above). The initial approach to engage prospective companies potentially in the Audit was by telephone. This process was found to be very time intensive and yielded a 50 percent success rate of agreement to participate. This was considered less than desirable.

The Steering Committee decided that a better approach would be to send a letter to all the companies in the catchment, raising awareness of the program and inviting them to participate. A total of 217 letters were delivered to businesses in the catchment. This approach was considered far more successful, being very targeted, although few companies proactively contacted the Council. Subsequent phone calls by the Council, however, were very successful. Most companies, once contacted were willing to participate and 48 of the 75 companies initially identified willingly participated in the program.

Subsequent to this process, PB and the Council identified a number of other companies in the catchment area for which it was desirable to include in the Audit. In particular, after spending considerable time in the area, PB identified a number of businesses for inclusion in the program, either due to the size of the site or the nature of the business. These businesses were contacted and agreed to participate in the audit. At the completion of this process, a total of 91 businesses had been contacted by phone, of which 69 agreed to participate. Refer to Appendix B for the list of the 69 businesses that participated in the program.

2.4 Audit Protocol

PB developed an audit protocol that was used at each site. The audit protocol acknowledged differences in the nature or size of the business but allowed broad comparison. This approach was adopted to standardise the audit methodology as much as possible, enabling site performance comparisons to be made at the completion of the audit program.

It must be stressed that the audit approach differed from the traditional environmental audit in that it focussed on actual and/or potential impacts on stormwater only.

PB's audit questionnaire focused on measuring stormwater management performance at each site against six criteria that were agreed to by the Steering Committee. These criteria were viewed as likely precursors to causing potential adverse impacts on Stony Creek. These six criteria were as follows:

- **Containment** – Storage of liquid and solid wastes, raw materials and products in a manner that would not impact adversely on quality of stormwater flows from the site including the appropriate application of EPA Bunding Guidelines (Publication 347);
- **Housekeeping** – Implementation of housekeeping standards appropriate to the size and nature of the site including general site cleanliness, availability of spill kits and material safety data sheets (MSDS), and the inappropriate storage of incompatible chemicals;
- **Maintenance** – Appropriate maintenance of stormwater drains, stormwater collection and site discharge points, wastewater collection systems and the minimisation of leaks and spills from any operating equipment;
- **Emergency Response Staff Resources** – Ensuring that there were sufficient staff at the site to address emergency situations that threatened stormwater and that these people were appropriately trained;
- **Procedures** – Verifying that procedures appropriate to the size of the business had been developed to manage environmental aspects at the site and that the possible risks of impacts to the stormwater had been addressed; and

- **Training and Awareness** – The site had established a training and awareness raising program focused on sound stormwater management practices.

A copy of the audit questionnaire is presented in Appendix C.

2.5 Site Inspections

Site audits were completed for 69 companies within the catchment area. Each site was visited for a period of one to two hours during which time the audit targeted stormwater management performance against the criteria described in Section 2.4.

PB's audit team consisted of four experienced environmental auditors and was overseen by an EPA Appointed Auditor (Industrial Facilities), David Spink. To ensure that the audit team members applied a consistent weighting to the identified threats to stormwater, the first round of audits were completed together. Subsequent site audits were then conducted individually. Four sites were nominated for the first round audits and represented a good cross section of different industry types and sizes.

The aim of each site visit was twofold. Principally, this was to identify any site procedures and practices that may lead to an adverse impact on Stony Creek including stormwater and wastewater infrastructure and discharge points. Secondly, the audit provided the opportunity to raise awareness about stormwater management practices and possible impacts on stormwater quality and in particular discharge to Stony Creek. Audit participants were also made aware of the SWMP and the NEIP.

Onsite meetings were typically held with Managers specifically responsible for environmental performance or Operations Managers at larger sites, and company owners or managers at the smaller sites. The site inspection process consisted of a desktop review of the companies' management practices and procedures (principally through discussion with the above designated on-site contact person) at which time the audit questionnaire was completed. A site inspection was then conducted to confirm discussion points and identify possible sources of stormwater contamination.

2.6 Risk Assessment

The risk assessment process consisted of a performance/consequence type format to arrive at an overall risk rating for the site. The risk assessment analysed the six performance criteria described in Section 2.4, (i.e. containment, housekeeping, maintenance, emergency response staff resources, procedures, and training and awareness).

Each of the six criterion was assessed using a number of parameters. For each of these parameters, individual site stormwater management performance and possible consequences on Stony Creek were assessed.

The site performance and consequence for each subclause were assigned a score between one (1) and four (4). A performance score of one (1) represented poor practice while a performance score of four (4), represented very good practice. A consequence score of one (1) represented a possible high adverse impact on Stony Creek, while a

consequence score of four (4) indicated a very low adverse impact on Stony Creek was potentially likely.

For each parameter the performance and consequence scores were multiplied together to produce a risk assessment score ranging between one (1) and sixteen (16). The average of the parameter scores were then calculated to achieve a score for each of the six criteria. An overall rating for stormwater management practices at the site was finally calculated by averaging the scores achieved for each criterion. Each of the six criterion were assigned an equal weighting. See Appendix D for the risk assessment proforma.

High site ratings indicated good stormwater management practices and a low possibility of impacting on Stony Creek.

Table 2.1 summarises the scores assigned for the performance and consequences achievable for each parameter assessed.

Table 2.1 Performance/Consequence Score Descriptions

Performance	Consequence
1. Poor Performance	1. High Impact on Stony Creek
2. Moderate Performance	2. Moderate Impact on Stony Creek
3. Good Performance	3. Low Impact on Stony Creek
4. Very Good Performance	4. Very Low Impact on Stony Creek

2.6.1 Interpretation of Risk Assessment Ratings

2.6.1.1 Performance

Performance ratings ranged from one (1) to four (4). The following interpretations were used during the audit:

- **Rating 1** - Poor performance – Indicated that there were obvious improvements that could be made to stormwater management at the site and that these improvements should be undertaken immediately to ensure that the impact to Stony Creek is mitigated;
- **Rating 2** - Moderate Performance – Indicated that improvements could be made to stormwater management performance at the site and would be applied where practices or infrastructure did exist, however, they were not functioning correctly or could be improved. Again immediate actions should be taken to improve the stormwater management performance at the site;
- **Rating 3** - Good Performance – Indicated that the site had established practices and infrastructure to ensure contaminated stormwater was not able to exit the site and that the site was generally well maintained; and
- **Rating 4** - Very Good Performance – Indicated that the site had excellent measures in place, appropriate to the size and nature of the business, that addressed stormwater issues at the site. They would proactively maintain the site and identify ways to minimise the potential to contaminate stormwater on site in the first instance.

They would also have very good emergency preparedness, appropriate to the nature of the business.

2.6.1.2 Consequence

Consequence ratings also ranged from one (1) to four (4). The following interpretations were used during the audit:

- **Rating 1** - High Impact on Stony Creek – Indicated that the site had the potential to highly impact on Stony Creek due to the nature of the company's onsite activities. High impacts may have included contaminated stormwater entering the stormwater drains or volumes of litter blowing offsite. Improvements should be made to the site immediately to reduce the high impact on Stony Creek;
- **Rating 2** - Moderate Impact on Stony Creek – Similar to a High impact on Stony Creek, however, volumes may be small and the site has taken some measures to reduce the potential for contaminated stormwater to enter Stony Creek. Again, immediate improvements should be made to the site to prevent the impact to Stony Creek;
- **Rating 3** - Low Impact on Stony Creek – Indicated that the potential for contaminated stormwater to be formed on the site was low and that water entering the stormwater drains from the site was unlikely to be contaminated and only minor improvements could be made. All wastewaters would be sent to sewer via an appropriate connection; and
- **Rating 4** - Very Low Impact on Stony Creek – Indicated that the site activities would mostly prevent the formation of contaminated stormwater in the first instance or have advanced systems, where appropriate, to prevent contaminated discharges from the site, and any wastewater was managed through appropriate sewer connections. Generally, no improvements could be made to the site that would reduce the impact on Stony Creek.

2.6.1.3 Site Ratings

Site ratings of nine (9), (3x3), and above were deemed to be an acceptable score for the risk assessment process. This represented good stormwater management performance (3) and a low possible impact on Stony Creek (3). It should be noted, however, that this also indicated that generally a score of 9 - 12 could be improved through various action improvements.

Ratings of eight (8) could be derived from either a combination of a moderate stormwater management performance (2) and a very low possibility of impacting Stony Creek (4) or very good performance (4), however, the possibility of site-specific environmental impact on Stony Creek still existed (2). Where a two (2) was assigned for performance, significant improvements could be made to the site to improve stormwater management practices or infrastructure. The reverse scenario was unlikely to exist where very good practice still presented a moderate possibility of impacting Stony Creek.

Scores of six (6) can be derived from either a combination of a moderate stormwater management performance (2) and a low possibility of impacting Stony Creek (3) or good performance (3), however, a moderate possibility of impacts to Stony Creek still exists (2).

A score of six (6) indicates that significant improvements could be made to stormwater management at the site and that such improvements would reduce the impact on Stony Creek. Actions should be implemented immediately to improve the performance of the site.

Scores of less than six (6) for any of the criteria indicated that either the performance is considered poor or the site is adversely impacting on Stony Creek. In this instance, practices at the site should be reviewed and action plans developed to improve the performance of the company.

2.7 Assessment and Reporting

Subsequent to the industry audit, an individual and confidential report was generated for each site. The report documented findings at the site and included a risk assessment produced in accordance with the criteria outlined in Section 2.4.

The written report included an overview of the site operations, audit findings (focusing predominantly on areas for improvement of stormwater management at the site), results of the risk assessment, and provided recommendations that should improve stormwater management at the site. The report also included basic details such as the audit date, site contact and name of the auditor. Where concerns had been highlighted, recommendations were also made. Recommendations would generally be targeted at improving any of the six criterion outlined in Section 2.4, however, these were based on practical solutions applicable to the sites. It is proposed that these recommendations be actioned to improve stormwater management performance at the site and to reduce the existing threats to stormwater.

The written report also detailed the risk assessment findings for each criteria. In addition to the rankings for the specific site, the average risk assessment score and the range of risk assessment scores of all the 69 companies were supplied as a comparison. This allowed companies to view their performance in relation to the other industry audit participants so that comparisons could be made.

Each company was supplied with a copy of their individual report to provide guidance on recommended approaches to improve stormwater management at the site. A copy of this (confidential) information resides with Council.

2.8 Follow Up to Audit Program

The first phase of the Project was completed after the individual audit reports were delivered to the respective participating companies. Subsequent to this, PB was again commissioned by the Council to undertake additional work. The focus of the additional work was to further communicate with industry participants regarding stormwater management and to monitor their thoughts and response to the Program. The scope of this work included:

- An industry workshop; and
- Follow-up site visits.

The aim of the industry workshop was to communicate the general findings of the Program, as discussed in this report, to the participants, and to offer further advice regarding stormwater management practices. One of the key findings of the Program was that containment and spill response management could be significantly improved on many sites. In addition to information provided by PB at the workshop, the Council arranged a number of spill kit providers to be present at the workshop. PB staff, who had performed the audits, were also available for further discussion with individual participants.

A total of 15 sites were scheduled to be revisited during the second phase of work. The aim of the second site visit was to determine the progress that each site had made with respect to the recommendations provided in their site reports. Where requested, PB was also able to further discuss the recommendations with the respective site representatives, providing further guidance on issues raised in the report. Sites to be revisited were determined by the score that they had received in the risk rating analysis. Those sites considered for a follow up review included those who had received a low overall score, or a low score against the containment performance criteria.

The follow up site reviews also enabled the Maribyrnong Neighbourhood Environment Improvement Plan (NEIP) Officer to attend some of the sites to gain an appreciation of the issues identified by PB and to gauge interest in potential further programs.

3. Discussion of Audit Results

3.1 Industry Audit Process

3.1.1 Engaging Participants

The overall methodology employed by the Steering Committee was deemed to be very successful. Of the 75 sites that had initially been identified for inclusion in the program, 48 agreed to voluntarily participate. Of the 27 that did not participate 13 had moved out of the area or were no longer operating and only 2 gave an outright 'no'. Other businesses were interested but didn't have time or explained that they were a very small site. The details of those companies that declined the offer were passed onto EPA for further investigation, to be actioned at the discretion of the EPA.

In summary, 91 businesses were contacted by telephone and a total of 69 sites were visited, which represented a 75 percent success rate.

PB's experience with programs of this nature indicated that the voluntary response to the program was at least as successful as others of this type.

3.1.2 Catchment Area Audited

The 69 sites represented a good cross section of industry sizes and types. The total catchment area of the sites audited was approximately 125 hectares or one third of the total catchment area, approximately 375 hectares. Of the 69 business audited, a total of 12 sites abutted Stony Creek, with a large proportion of the remaining sites located on streets with main drains that directed stormwater to Stony Creek.

3.1.3 Auditing Process

The site visits focused on stormwater management on a number of levels. The completion of the audit questionnaire identified practices and procedures employed by the businesses to manage stormwater discharges from the site. The approach to the site visits also informed participants of the aspects at their site that should be targeted to maintain or improve stormwater management, i.e. "no surprises".

The site inspection targeted technical issues such as stormwater management infrastructure and site layout. This process involved discussion of possible options and expectations of existing standards, (e.g. EPA Bunding Guidelines). PB found that this process was, in most cases, both an educative and investigative process, helping to raise awareness of sound stormwater management practices and identify potential impacts on Stony Creek.

Perhaps surprisingly, it can be reported that all the companies participating in the industry audit were very obliging. Typically, managers at the site made themselves available to undertake the audit and the PB auditors were shown around all operational areas of the site. Consequently, a comprehensive inspection of each site was undertaken. PB would

like to thank those companies that participated in the program for their cooperation and openness throughout the audit.

The auditing process allowed for up to two hours at each site, (irrespective of the size and type of industry). It is understood that some of the smaller, less complicated sites could be completed in less than this time, while the larger sites would require more than two hours. The questionnaire was found to be a good tool to maintain focus on the stormwater issues.

3.2 Risk Assessment Results

At the completion of the each site audit a risk assessment report was produced, using the methodology described in section 2.6. Table 3.1 below summarises the average score for each of the six criteria used to assess the performance of each site, and the score range for each criteria.

Table 3.1 Summary of Risk Assessment Results

Risk Assessment Score (1 – 16)*		
Item	**Average Score**	**Score Range**
Containment	9.2	3.0 - 16.0
Housekeeping	9.8	5.0 - 16.0
Maintenance	9.3	5.0 - 15.0
Emergency Response Staff Resources	9.6	4.0 - 16.0
Procedures	8.7	5.0 - 16.0
Training	9.3	6.0 - 12.0
Overall Rating	**9.4**	**5.0 - 15.0**

*16 equates to very good performance, 1 equates to very poor performance.

The risk assessment process was useful for indicating not only the individual site performance but the general performance of the companies participating in the program.

For each of the six criteria, the average score indicated that across all the companies audited, stormwater management performance was reasonable and the resultant potential impact on Stony Creek is likely to be low, based on typical emissions from the site. The average scores obtained for the six criteria ranged from 8.7 to 9.8. Generally, these scores indicate that good stormwater management was undertaken across the companies in the audit program.

The average scores also indicated that one of the key areas requiring improvement were the procedures for managing stormwater at the site, whether they be formal or informal, depending on the size and nature of the business. By contrast, housekeeping was awarded the highest risk assessment score of 9.8, indicating that in general, the housekeeping practices were satisfactory to prevent stormwater contamination. It is noted that numerous recommendations were made to improve housekeeping at the sites. This score reflects the number of smaller companies whose housekeeping practices are not likely to significantly impact on stormwater.

The score range clearly identifies that some sites need to significantly improve their stormwater management performance, while others present very little risk to impacting the stormwater quality. It is noted that containment issues posed the most significant risk to stormwater, which is consistent with the number of recommendations made by PB to the individual sites. In light of the average scores versus the score range, these results indicate that there were more good performers than poor performers, however, most sites required improvement of some sort. Companies were supplied with recommendations in their written audit reports to provide guidance for improving their stormwater management performance and reduce the likely impact on stormwater from their site.

3.3 Stormwater Management Results

PB made a total of 222 site-specific recommendations for 61 of the 69 sites audited. There were no specific recommendations for the remaining eight sites indicating either:

- The operations were very benign and did not potentially impact on quality of stormwater; and/or
- Stormwater management was of a standard that would minimise any negative impact on Stony Creek.

To enable a useful analysis of the findings of the audit program, these recommendations have been divided into the six criteria outlined in Section 2.4. PB analysed the main threats to stormwater by reviewing the number and nature of the recommendations made in each category. This analysis was adopted to give an overall indication of the environmental risks posed to Stony Creek from the catchment area and to indicate the main areas for improvement.

In addition to this analysis, PB also reviewed these recommendations according to the seven industry types identified at the commencement of the project, to further outline the performance of stormwater management in the catchment area. By assessing the recommendations in this manner, it provides insight into the performance of these industry groups and provides a more targeted approach to improving stormwater management in the catchment area.

The findings of these assessments are documented below.

Appendix E contains the full report and risk assessment for each site. Due to agreed confidentiality commitments made by the Council, this document is not available for public viewing or to EPA, and therefore is not attached to the body of this report.

3.3.1 Results by Criteria

The six criteria used to outline the main risks to stormwater have been condensed into four categories. The Emergency Staff Response Resources, Procedures, and Training and Awareness criteria have been combined because the site performance against each of these criteria was closely related.

Table 3.2 summarises the number of recommendations made in each category. These results indicate that significant improvements can be made to stormwater management in

the catchment area across all 7 broad industrial categories. By default, they also indicate where most improvements can be made to reduce potential impacts to Stony Creek.

Table 3.2 Industry Audit Recommendation Statistics by Category

Category	Number of Recommendations
Containment	79
Housekeeping	50
Maintenance	34
Emergency Staff Response Resources, Procedures, and Training and Awareness	59

The results of the audit findings are discussed in detail below.

3.3.1.1 Containment

The largest number of recommendations for improvement to stormwater management at the sites audited were focussed on containment. A total of 79 recommendations were made to improve containment. This focussed on 45 of the 69 sites audited. Containment relates the proper storage of liquids, whether they are contained in process vessels, intermediate bulk containers (IBCs – 1000L) or smaller containers such as 205 Litre and 20 Litre drums. There were three main avenues identified for improving containment at the sites:

- Containment of liquids in bunds;
- Storage of liquids inside buildings but located away from drains; and
- Storage of liquids on pallets.

The EPA's Bunding Guidelines (Publication 347) outline the expectations for containment of any liquids. Most of the recommendations relating to bunding referenced this document. The Bunding Guidelines provide specifications for containment of both tanks and drums. In particular, bunds containing tanks should have sufficient capacity to hold 100 percent of the largest tank plus 10 percent of the next largest tank. The tanks should also be positioned in the bund in accordance with the 'half height rule', which requires the bund wall to be a distance equivalent to half the height of the tank from the base of the tank. Bunds containing drums should have sufficient capacity to hold 25 percent of the volume of the maximum number of drums able to be stored up to 10 kL, plus 10 percent of additional volume. Recommendation provided by PB indicated that approximately half of the sites requiring improved containment adopt the Bunding Guidelines.

A number of the smaller sites had containment issues where they stored several drums on site with no containment. Quite often the drums were stored close to stormwater drains. The Bunding Guidelines outline that specific bunding is not required for storages of less than five to six 205 Litre drums, however, the stormwater drains should be protected. To this end PB recommended that companies identify ways to reduce the possible impacts to stormwater. Such improvements may include either moving small quantities of chemicals inside, away from stormwater drains or using bund pallets to contain the liquids. Bund pallets are pallets that can collect spills and have been moulded to fit the forks of a forklift for easy transportation. Bund pallets were typically recommended to

smaller companies and those that needed to transport chemicals around the site by forklifts.

Containment also related to the management of stormwater captured in bunded areas or the disposal of wastewater. Water captured in bunds should not be released to the stormwater drains if it has been contaminated. Instead it should be disposed of to the sewer in accordance with a Trade Waste Agreement or removed to an EPA approved facility for treatment prior to disposal. Wastewater should also be disposed of via the trade waste or an EPA approved facility. Several sites inspected during the program were found to be discharging contaminated water to the stormwater drains as part of an annual process shutdown program. These companies were advised to contact the Council and City West Water to rectify the issue as soon as possible. In a number of cases, the companies were already working with City West Water to rectify the issue.

Several companies located adjacent to Stony Creek reported to PB that they had at times previously observed a milky white substance in Stony Creek. Although this had not occurred recently, PB got the impression that this had occurred a number of times during the previous years. Companies were encouraged to contact the EPA if this material was sighted again so that the offending company can be identified.

One point of note was the number of companies that undertook some form of vehicle or truck washing on their sites. This process typically involved the use of detergents and in a number of cases the contaminated stormwater could reach the stormwater drain. Where vehicles and trucks were washed on site, without containment, PB recommended that the vehicles be washed at an appropriate facility that collects wash waters, or in some cases, the installation of a truck wash facility onsite.

The average risk assessment score for Containment was 9.4, with a range of 3.0 to 16.0. It is noted that the average containment score was influenced by a number of small companies whose practices, although require some improvement, would not have a large impact on Stony Creek. The lowest score of 3.0 indicates that some companies need to improve their stormwater management practices significantly to ensure there is little impact on Stony Creek from their operations.

Most recommendations for improving containment in the catchment area were aimed at managing issues related to possible spills and emergency type events rather than containing ongoing discharges to Stony Creek.

3.3.1.2 Housekeeping

Housekeeping was assessed by the overall appearance and standards established at the site, and the effectiveness of the implemented standards. PB also reviewed the adequacy of spill kits and the existence of material safety data sheets (MSDSs) for onsite chemicals to make a valued judgement on the housekeeping standards. Where applicable, the inappropriate storage of dangerous goods was also noted.

PB made 50 recommendations to improve housekeeping. Typically, the smaller businesses had poorer housekeeping standards, however, a number of these businesses were enclosed and were considered to not present a significant threat to subsequent stormwater quality in Stony Creek. Several larger companies also had poor housekeeping practices, including a poor understanding of stormwater drain networks on site, excessive litter that could exit the site, and generally poor site cleanliness both inside and outside

the enclosed areas. Several companies informed PB that litter in the general area was a problem and that it frequently blew onto the site from the neighbouring main roads.

Some excellent housekeeping practices were also observed (e.g. the placement of equipment on drip trays to prevent any oil leaking to the floor). Other good practices included labelling stormwater drains, strategically located bins around larger sites for use by employees, and frequent sweeping and cleaning of external areas to minimise dust generation at the site. Spill kits were clearly a focal point for some companies and at these sites spills kits contained several different absorbent mediums to respond to a spill, and were either mounted or contained in wheely bins. PB encouraged this practice.

Numerous companies did not have any spill kits, other than some rags for cleaning up spills. In a number of cases, those companies that had purchased spill kits could improve their location on site to enable a quick response to protect stormwater drains. PB recommended that 26 companies obtain spill kits for use at their site in the event of an emergency.

A number of companies did not have MSDSs available at the site and consequently were marked down on their housekeeping. MSDSs are very useful documents and inform users of the appropriate measures that should be used to respond to any spills including appropriate clean up materials, threats to the environment and health risks.

3.3.1.3 Maintenance

The Maintenance criteria focused on appropriate programs to maintain the cleanliness of stormwater drains and any interceptor traps or stormwater collection points at the site. It also focused on the maintenance of equipment at the site to ensure that the potential leaks from equipment were minimised. PB made 34 recommendations to improve maintenance activities.

PB found that for a large number of sites, stormwater drains were not accessible because they drained directly from the roof to underground drains and into the stormwater drains. A number of companies reported that they leased the site and believed that drain cleaning was the responsibility of the lessor. In a number of cases where companies formed part of an industrial estate, the lessors did clean the roof gutters on an ongoing basis, typically annually. In keeping with good housekeeping standards, several companies did undertake frequent sweeping and other measures such as the installation of litter traps to prevent materials entering the stormwater drains. In general, roof gutters were more likely to be cleaned than stormwater drains. PB made a recommendation to several companies to either contact their lessor or undertake a stormwater drain cleaning program, however, the integrity of the stormwater drains across the sites visited were generally in good working order.

Those companies that had installed a triple interceptor pit (TIP) generally maintained them in good working order. Although a number of companies reported that the cleaning frequency had been determined by 'trial and error', most companies reported that they were now well maintained. It was unclear, whether the 'trial and error' process had lead to impacts on Stony Creek. Inspection of the areas at these companies did not reveal visible signs of contamination.

Very few companies that used lifting equipment onsite, serviced the equipment themselves. Most companies contracted a company to undertake the maintenance and

part of this serviced involved removing the waste oil from site. Consequently, only a handful of companies stored waste oil on site from maintenance activities on lifting equipment. The larger sites that used process equipment items, maintained the equipment by a maintenance program and in doing so prevented excessive leaks from equipment. A number of sites also enclosed the process areas or bunded them to prevent the contamination of stormwater.

3.3.1.4 Emergency Response Staff Resources, Procedures and Training

Although the emergency response staff resources, procedures and training criteria were assessed separately, PB found that each of these criteria was very much related.

The emergency response staff resources criteria focused on a company's ability to respond to an incident that threatened the stormwater and the measures they had taken to train people appropriate to that risk, including situations where staff typically responsible for overseeing incidents were absent, or the company operated more than one shift per day.

The procedures criteria focused on the systematic and operational structure that a company had adopted to manage stormwater issues at the site and any procedures they may have adopted to give guidance in the event of an incident. The extent to which stormwater management was proceduralised was dependent on the size of the company and nature of activities performed at the site.

Training and Awareness included training for emergency response and proceduralised activities at the site, but also assessed the overall awareness programs at the site for general stormwater management practices.

For these three categories PB made a total of 59 recommendations. The industry audit program revealed that the smaller sites had typically not been proactive in these areas. It is fair to note that a number of companies visited, employed a small number of staff and in these circumstances, PB would not have expected to see a documented system. However, although staff at the smaller sites were mostly aware that contaminated water was not to be discharged to the stormwater, their practices did not always reflect this reported awareness. This was particularly the case with chemical and waste liquid storage practices and their ability to react to a spill. Consequently, PB made numerous recommendations to the smaller sites to improve their awareness of stormwater management issues and spill response procedures at the site. These smaller sites could improve by undertaking informal discussions with staff or posting of flyers around the workplace.

At larger sites with chemical or manufacturing processes, more sophisticated systems, training and emergency response procedures were adopted. Most of these sites had environmental management plans, of which stormwater was one aspect, and appropriate proactive measures in place to raise awareness at the site. Training in spill management was also undertaken at most of the larger sites. Several sites had also adopted incident reporting systems, however, these were not common. Where multiple shifts existed at the site, companies had ensured that safety representatives were apportioned across the shifts and were appropriately trained to respond to emergencies including threats to

stormwater. PB noted that several of the larger sites could improve their environmental and stormwater management procedures and awareness raising programs.

3.3.2 Results by Industry Type

Although the discussion in Section 3.2.1 outlines risks to stormwater by criteria, the audit revealed that the industry groups varied in their performance against each of these criteria. Table 3.3 outlines the number of industries visited in each industry type and the number of recommendations for each industry group. The following discussion elaborates on these statistics, outlining key issues identified in each of the industry groups. See Appendix F for a summary of the recommendation statistics.

Table 3.3 Industry Audit Recommendation Statistics by Industry Group

Industry Group ID	Industry Group	No. of Sites Visited	Number of Recommendations
1	Automotive/Mechanical	13[a]	42
2	Enclosed Warehousing	11	30
3	Distribution/Transport Depot	11[a]	39
4	Manufacturing	15[b]	52
5	Food Industry	6[b]	11
6	Paints and Textiles	8[a]	33
7	Metal Works Industry	5[a]	15
Total	**-**	**69**	**222**

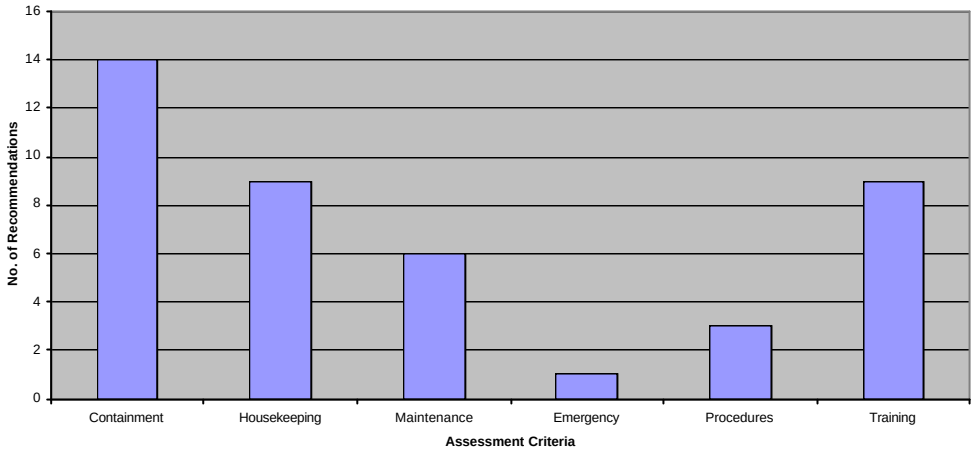
Notes: a. 1 site – no recommendations.

b. 2 sites – no recommendations.

3.3.2.1 Automotive/Mechanical

The Automotive/Mechanical industry group describes those businesses that repair vehicles or vehicle parts or operate general mechanical workshops. A total of 13 sites were visited during the industry audit and an average risk assessment score of 9.2 was achieved. PB made a total of 42 recommendations, which were spread across each of the four categories, described in section 3.2.2. This spread was consistent with to that obtained for the entire Audit. PB did not need to make any recommendations at one of the sites. The two main areas for improvement included containment, and emergency response, training and procedures. Maintenance required the least amount of attention, however, this reflects the number of business in this group that occupied sites contained within small industrial estates where access to the drains may not have been a high risk. It also reflects the generally proactive approach of this industry group to maintaining interceptor traps. Below is a graph detailing the number of recommendations for each assessment criteria:

Automotive/Mechanical -
No. of Recommendations for Each Assessment Critiera



The following recommendations were typical of the industry:

- Most companies employed five or less people;
- Sawdust was used for spill kits (companies were advised against this);
- Spill kits were not strategically located;
- The industry would benefit from the use of bund pallets; and
- Awareness raising of stormwater issues requires improvement.

In summary, the bulk of the risks to stormwater from this industry group arose from potential threats rather than actual demonstrable discharges to stormwater. However, improvements are required to prevent the possible incidents on Stony Creek.

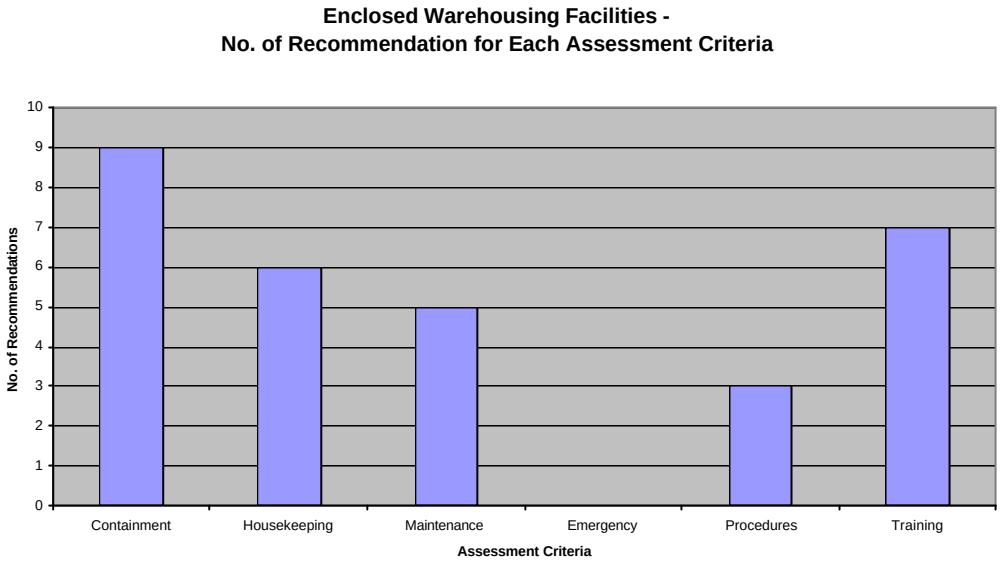
3.3.2.2 Enclosed Warehousing Facilities

Enclosed warehousing facilities include all those sites that operate warehousing facilities and whose activities are enclosed. The sites in this category are completely paved and products are typically stored in buildings or other facilities such as shipping containers. A total of 11 sites were visited during the industry audit and an average risk assessment score of 9.5 was achieved. PB made 30 recommendations, aimed at improving performance at these sites. Approximately two thirds of the recommendations focused on containment and awareness raising.

Containment improvements involved obtaining spill kits and bunding chemicals stored 'in transit'. PB typically recommended that containment would be improved by the installation of bunds in accordance with EPA's Bunding Guidelines (Publication 347) to address the containment issue.

The companies also need to improve their awareness of stormwater management at the site, to educate employees at the site because facilities of this nature were identified as possible sources of litter, impacting on the stormwater drains.

Below is a graph detailing the number of recommendations for each assessment criteria:



The following points were also typical of the industry:

- External areas were typically completely paved but not adequately separated from the stormwater system;
- Housekeeping at the sites was of a high standards and external areas were kept clean; and
- Storage of materials were typically confined to inside the warehouse, presenting little threat to stormwater.

In summary, this industry group needs to proactively maintain external areas at the site due to the size of the facility and possible litter on site. Numerous sites stored chemicals 'in transit', without any containment. Consequently the risk of spills entering the stormwater drains was quite high due to the close proximity of these chemicals to the stormwater drains.

3.3.2.3 Distribution and Transport Depots

Distribution and transport facilities include all those sites that operate storage depots and transfer areas for distribution whose activities are typically outside, on unpaved surfaces. A total of 11 sites were visited during the industry audit and an average risk assessment score of 88 was achieved. This was the lowest scoring industry type for the audit. PB made 39 recommendations across 10 sites. It is noted that recommendations were not required for one site.

This industry typically undertook truck washing on site, presenting a risk to ongoing ground contamination and possible discharges to Stony Creek of wash waters containing detergents. Some sites washed up to 400 trucks a year at the site, with no truck washing facility. PB recommended that these sites consider the installation of a truck wash facility.

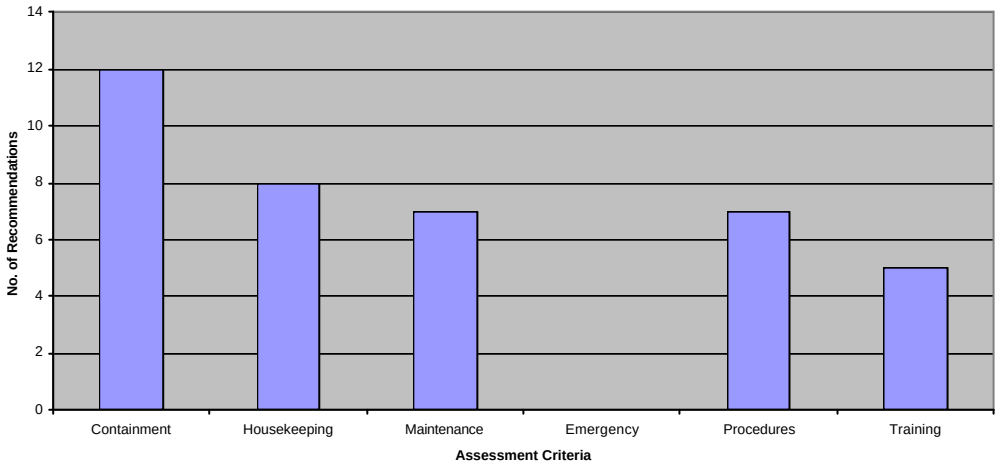
Due to the unpaved surfaces at the site, a number of these companies did not have stormwater drains installed at the site, or they were not aware of the discharge points at the site.

Due to the unpaved surfaces covering vast areas, a number of these sites were a source of significant dust emissions on dry windy days. In most cases these larger storage depots were used to store shipping containers for the transport logistics industry or bulk liquid storage containers. Few of these larger sites had water trucks or other dust suppression measures available, allowing dust and ultimately sediment to enter the street drains. The sites were also a source of sediment build up in the stormwater drains, as trucks would deposit dirt on the roads.

The smaller of these facilities audited, were typically used for storing equipment that was used at other sites. Generally, the housekeeping at these smaller facilities was poor and containment of any liquid dangerous goods or lubricating and waste oils was poorly managed. PB made a number of recommendations at these smaller sites to bund oil storages and improve housekeeping.

Below is a graph detailing the number of recommendations for each assessment criteria:

Distribution /Transport Depot -
No. of Recommendations for Each Assessment Criteria



The following issues were also typical of the industry:

- The sites covered large areas, commonly in the order of 10,000m^2; and
- Most sites had one site boundary that backed onto Stony Creek;

In summary, these sites were generally dusty, required improved housekeeping and improved general awareness of their sites potential to impact on Stony Creek. They also needed to improve containment of liquids. The main risks to stormwater included the truck washing activities and dust and sediment emissions.

3.3.2.4 Manufacturing

The manufacturing sites audited varied significantly in the size, complexity and ultimately the threats to stormwater quality in Stony Creek. The group encompassed a broad range of manufacturing activities including chemical, packaging, communication, automotive parts and other miscellaneous manufacturers. A total of 15 sites were visited during the industry audit, the largest number audited of the seven groups. The average risk assessment score achieved was 9.5 and PB made 54 recommendations, aimed at improving stormwater performance at the sites.

The number of recommendations for containment was approximately double the other criteria. A total of 19 recommendations were produced, which addressed not only containment of chemical storages but also the containment of processing equipment and wastewater in isolated circumstances. Generally, containment of threats to the stormwater from the manufacturing industry could be improved.

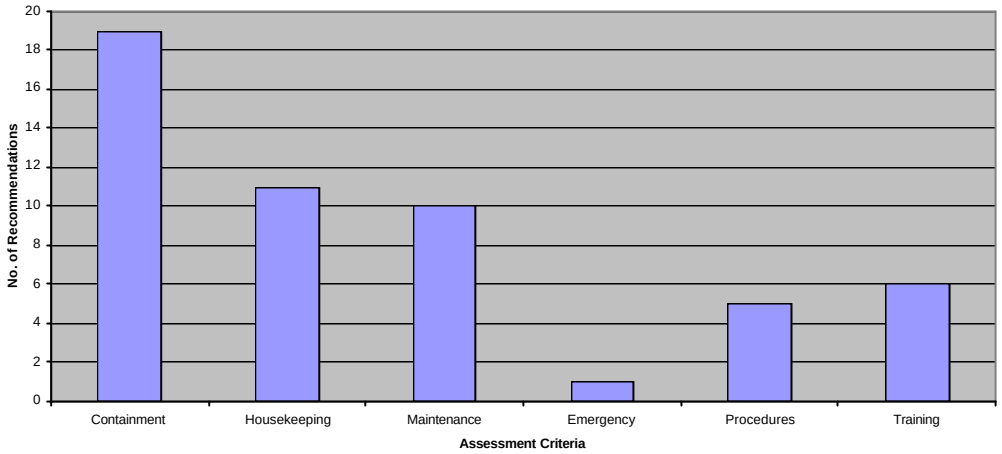
The number of recommendations for housekeeping, maintenance and training, procedures and emergency response performance criteria were approximately the same:

- Housekeeping recommendations predominantly addressed the storage of waste and materials for use in the processes. Wastes storages proposed threats to the stormwater such as the discharge of excessive litter and sediment rather than chemical discharges. These issues were applicable to a range of manufacturing companies; and
- Improvements could be made to training and procedures at a number of the sites. Typically, these improvements were recommended to the small and medium sized manufacturers rather than the larger companies. The larger companies operated under a proceduralised system or plan and consequently addressed most of these issues.

Recommendations to address maintenance of stormwater threats at the manufacturers were mostly site specific. They focused on cleaning and or repairing stormwater drains and addressing any equipment leaks and seals around bunds. On a number of occasions recommendations were also made to investigate possible impacts from adjacent sites.

Below is a graph detailing the number of recommendations for each assessment criteria:

Manufacturing -
No. of Recommendations for Each Assessment Criteria



In summary, the risks to stormwater from manufacturing process were not typically from the processes themselves but ancillary activities undertaken at the site. This finding highlights the importance of raising the awareness of sound stormwater management practices at the sites. Isolated discharges of wastewater to stormwater were discovered and PB has recommended that these companies rectify this issue. The Council has also been notified of these practices and will work with the companies to improve their performance.

3.3.2.5 Food Industry

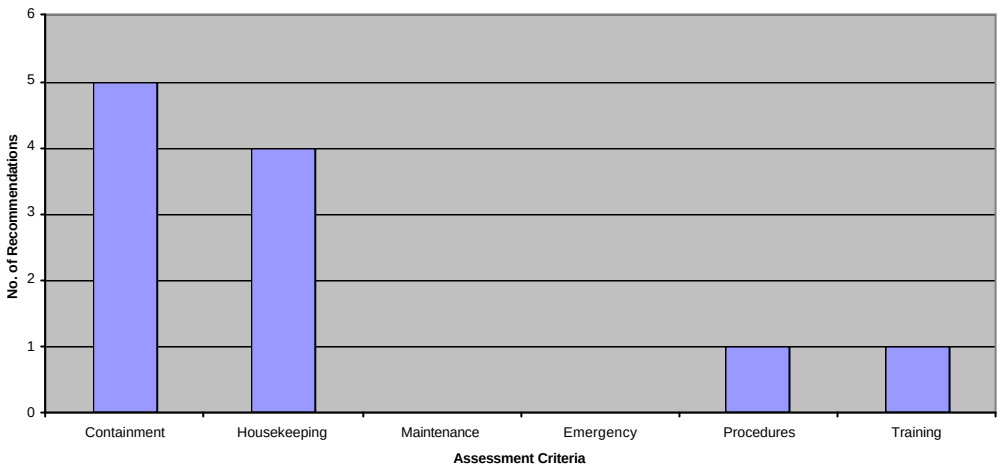
The Food Industry included all those sites that manufactured or handled packaged food. A total of six (6) sites were visited during audit and an average risk assessment score of 10.9 was achieved. This was well above the audit average of 9.4. PB made 13 recommendations, aimed at improving stormwater management performance at the sites, however, no specific recommendations were made at two of the sites.

Generally, these sites were well maintained and housekeeping was of a high standard. Based on our experience, due to the health standards imposed on the food industry, it is not surprising that they rated so highly. Very few recommendations were made regarding improvement of training and or procedures because it was evident that the site was well maintained.

Most recommendations made were focused on containment issues such as bunding tanks and drums, or relocating the storage of liquids to more appropriate locations on the site.

Below is a graph detailing the number of recommendations for each assessment criteria:

Food Industry -
No. of Recommendations for Each Assessment Criteria



3.3.2.6 Paints and Textiles

The Paints and Textiles industry group included those sites that either manufactured paints or dyes or produced textiles in some cases using inks and dyes in the production process. A total of 8 sites were visited during the audit and an average risk assessment score of 9.1 was achieved. PB made 34 recommendations, aimed at improving stormwater management performance at the sites. Over a third of the recommendations focused on containment issues at the sites.

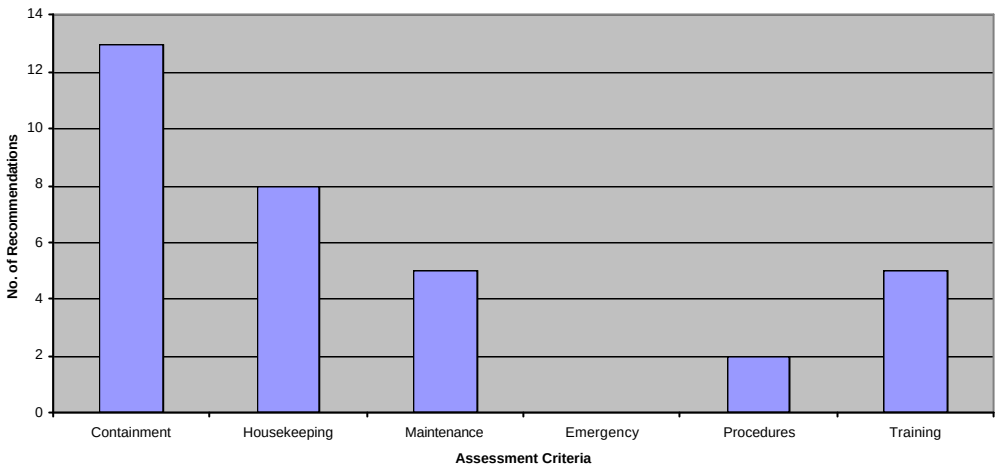
Containment issues can be divided into three main areas. The bulk of the containment issues related to bunding. Such issues identified included possible inadequate sizing or adherence to the EPA Bunding Guidelines (Publication 347) or in some instances bunds were provided but were not always used.

Secondly, containment recommendations focused on measures to prevent the contamination of stormwater in the first instance, such as ensuring all waste and product feedstock materials were kept undercover.

The third area, which raised concerns with PB auditors was the potential for process wastewater to enter the stormwater drains at some sites. It was noted that knowledge of the discharge points from some site's drainage networks were not well understood. Some of these sites were already working with City West Water to improve their management of the potential wastewater discharges at the site. PB did not witness any illegal discharges to stormwater during the audits, however, the potential for off site impacts was identified for activities that are performed intermittingly. Recommendations were made to rectify these issues.

Below is a graph detailing the number of recommendations for each assessment criteria:

Paints and Textiles -
No. of Recommendations for Each Assessment Criteria



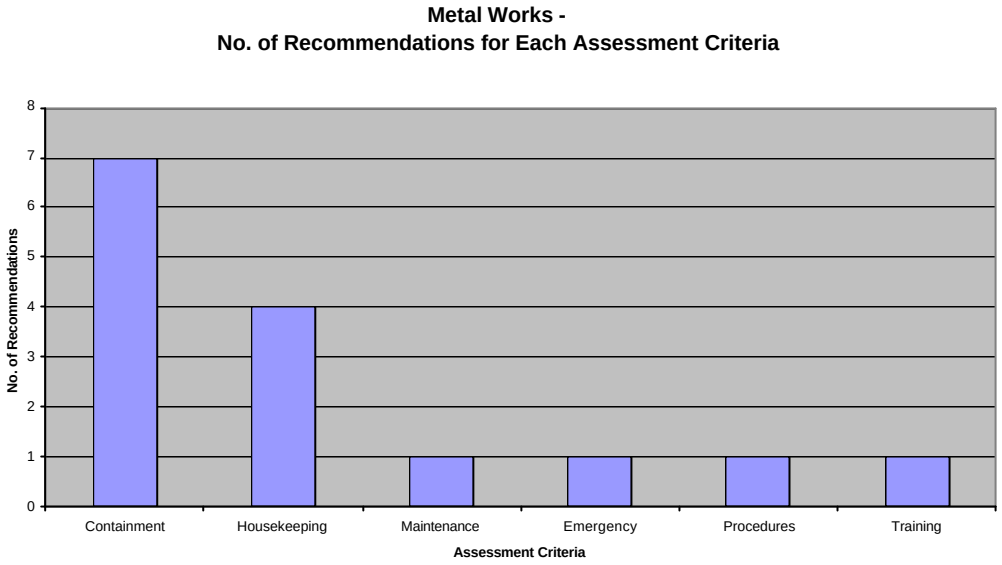
PB also identified that the sites would benefit from improved training and awareness of sound stormwater management practices by operating staff at the site.

Housekeeping could also be improved at these sites by ensuring the site has appropriate spill kits and spill response measures and by general site cleanliness, particularly at some of the larger sites visited.

3.3.2.7 Metal Works

Metal works included those sites that produced metal products as their core business. A total of 5 sites were visited during the Audit and an average risk assessment score of 9.5 was achieved. PB made 16 recommendations, aimed at improving stormwater management performance at the sites. The operating areas of these sites varied significantly from small workshops to larger industries. Due to the equipment used to produce the metal products, operating areas tended to be located undercover and consequently the potential for impacts to the stormwater were significantly reduced.

Below is a graph detailing the number of recommendations for each assessment criteria:



The main area for improvements in this industry was containment and housekeeping. The industry may benefit from the use of bund pallets to improve storage of lubricating oils and the installation of drip trays under the equipment to contain any oils used during the cutting process. Stormwater management performance could also be improved by obtaining appropriate spill kits.

3.4 Follow Up Results

3.4.1 Industry Workshop

The Council, in conjunction with PB, held the industry workshop at their offices on Thursday 13 February 2003. All participants in the program were invited to the industry workshop. In addition, the Council also invited the EPA, who had been on the Program's Steering Committee and provided funds for the Program under the auspices of VSAP, and staff from the City of Kingston who were interested in the results of the program for their own projects.

Approximately one third of the participants accepted the invitation, however on the day of the workshop only a handful of companies were represented. The attendance at the workshop was disappointing, considering the positive response that PB had encountered during the initial site visits and the number of acceptances to the workshop itself. The presentation was scheduled for a time towards the end of the day (3:30pm). This decision was made so that it would minimise the impact on work time and possible encroachment into people's after work commitments. Industry participants were also given a number of weeks notice so that they could plan it into their schedules.

Discussions with some companies during the follow-up site visits revealed that assigned representatives did not attend because predominantly they were too busy on the day, or because they had already invested considerable time in the project and perceived that

the benefit to be gained from the additional workshop would be minimal compared to the report they had already received.

For those who did attend, they found that the presentation of the findings was beneficial, putting into context the issues at their site and how they compared against other sites within their industry sector. The opportunity to discuss the particulars of their report was also welcomed. Information made available by the spill kit suppliers was appreciated and participants were able to obtain brochures on relevant absorbent material for spills that they may encounter at their sites.

3.4.2 Follow-up Site Visits

PB proposed to revisit 15 sites to determine the actions implemented in response to the recommendations made in the reports, and to further discuss any details of the reports if required. During some of these audits the NEIP Officer accompanied PB so that he could gain an appreciation of the issues identified during the initial audit and to gauge the interest in any additional programs that industry may be involved in under the NEIP. Programs to be implemented under the NEIP are beyond the scope of this report.

Of the 15 sites scheduled to be revisited, 13 were actually visited. Relevant staff at the other two sites were not available due to other commitments, despite efforts to reschedule the site visit. At the 13 sites visited over half of the recommendations made had either been completed or partially actioned. At a number of sites, most recommendations had been actioned, however at two sites none of the recommendations had been implemented. Where no actions had been implemented, PB typically found that site representatives, initially involved in the program, were no longer employed by the company or were not currently working at the site. Consequently, ownership for implementation of the recommendations in the report had not been reassigned. In these instances, the process of the follow-up site visit was beneficial to the Program, in that it refocused the company's management on issues raised in the report. In one instance, a company reported that it was in the process of appointing an environmental engineer, to oversee environmental management for the entire company and duties would extend to the specific site involved in the Program.

PB also found that the companies revisited were quite responsive to the follow-up review and were keen to discuss the report and recommendations made, and to demonstrate the work that they had undertaken in response to the Program.

As a result of these findings, it is recommended that the NEIP Officer undertake follow-up audits at the remainder of the sites, where recommendations were made. Not only will this help the Council understand more completely the response to the Program, but it will also provide an impetus for the sites to continue to improve stormwater management. It will also provide as a mechanism for recognition of the participants for the work performed in response to the Program.

4. Recommendations

The following recommendations are made in order of importance to improving stormwater management in the area included in the audit.

4.1 Strategies to Abate Stormwater Risks

The Audit revealed that numerous improvements could be made at most sites to better manage the risks to stormwater and Stony Creek. It was evident that these improvements consisted of both site specific issues and general issues that were evident across all the sites. PB makes the following recommendations in order of importance to improving stormwater management in the catchment area.

Recommendation 1

PB found that containment issues were typically site specific. PB informed these companies of the general requirement of EPA's Bunding Guidelines. To assist the implementation of these requirements PB feels that it would be beneficial to revisit some of the companies audited to assist them with this process.

- Revisit 15 of the lowest scoring sites for containment and/or overall ratings, and give them site-specific guidance on improving bunding and other containment strategies for the site.

Recommendation 2

Typically, housekeeping and general awareness of stormwater management issues required improvement across the participants involved in the audit. The audit program was useful for raising the awareness of stormwater management concerns confronting Stony Creek catchment and the general expectations of regulatory authorities. PB found that this information was well received and that there was general interest by companies to 'do the right thing'. To this end, PB foresees that additional awareness raising for businesses in the catchment area would be a benefit and that this may be achieved by holding an industry forum.

- Hold an industry forum (workshop) for all the industry audit program participants and the greater industrial community in the catchment area. This workshop could focus on the general findings of the program and on improvements in identified areas such as bunding, housekeeping, and awareness raising of potential stormwater management issues at the sites.

Recommendation 3

The Council is due to appoint a Neighbourhood Environment Improvement Plan (NEIP) Officer in the near future. The NEIP program is integral to the improvement of the general environment in the Council's jurisdiction and coupled with the Stormwater Management Plan provides a framework to progress stormwater management to a new level within the catchment. The audit is viewed as the commencement of a working relationship between Council and industry and should be proactively progressed by the NEIP Officer.

- Council should utilise the audit program as the first step to building relationships with industry in the audit area, and through the NEIP Officer, develop visible and proactive contact with local industries.

Recommendation 4

The audit program has identified a number of areas for the Council to direct its attention to improve the stormwater quality in the Stony Creek catchment. The audit program should be broadened to include all industries in the catchment area. It is noted that intensive industrial zones also exist upstream of the catchment area and consequently may also impact on Stony Creek. The Council should contact neighbouring Councils to widen the program to further reduce possible threats to the Stony Creek catchment.

- Extend the audit program to all businesses in the catchment area and work with neighbouring Councils to Maribyrnong to address industrial threats from these areas. It is estimated that the auditing and reporting of audits for an additional 130 sites would take approximately 900 hours. This would include contacting sites, auditing (based on 4 sites per day), report summaries, analysis of data and a workshop. Risk assessment methodologies and audit protocols already produced could be used. This would, however, exclude producing a general summary report and any follow up audits.

Recommendation 5

The audit and follow-up site reviews has commenced an awareness-raising program for industrial companies within the catchment area, which provides a foundation for further education on stormwater management expectations of the Council.

- Council should continue to promote useful information to industry to improve stormwater management. This could be managed by the NEIP Officer. In particular, follow-up site visits to the remaining companies that received recommendations would be beneficial. This would provide an impetus to the participants to continue to improve stormwater management and would provide recognition for the work performed in response to the Program. The NEIP Officer may also wish to consider issuing a formal certificate to all participants in recognition for their involvement in the Program.

Recommendation 6

The largest number of recommendations made by PB involved issues relating to the containment criteria. A total of 79 recommendations, regarding containment, were made to 45 of the 69 sites visited during the Program. In a number of cases, containment was related to the installation of bunding or bunding improvements. Such site improvements may or may not have required notification to the Council and consequently it is difficult to monitor this threat to stormwater. This situation may have arisen because such activities were not identified in the first instance or sites altered their operations or practices without informing the Council.

- Review planning mechanism to ensure that installation of all significant containment infrastructure is included in the Planning Approval process.
- Raise awareness of Urban Planning, Building Services, Infrastructure Planning, City Services and other relevant departments in the Council to recognise issues that could impact on the stormwater quality.
- Undertake site inspection and enforcement action where appropriate.

4.2 Sampling Program

Although it was recognised that significant improvements could be made at a number of sites, planned discharges to stormwater were not common. Most of the audit findings identified practices that threatened the stormwater rather than actual practices of ongoing discharges to stormwater. Consequently, adverse impacts on Stony Creek are more likely to be episodic rather than routine. Results from any sampling program are therefore likely to be influenced by the general attitude of industry in the area and their efforts to prevent episodic events from reaching Stony Creek. From this perspective, the Audit has successfully targeted the main stormwater issues in that it has focused on awareness raising, containment and a company's capability to respond to incidents that threaten the stormwater.

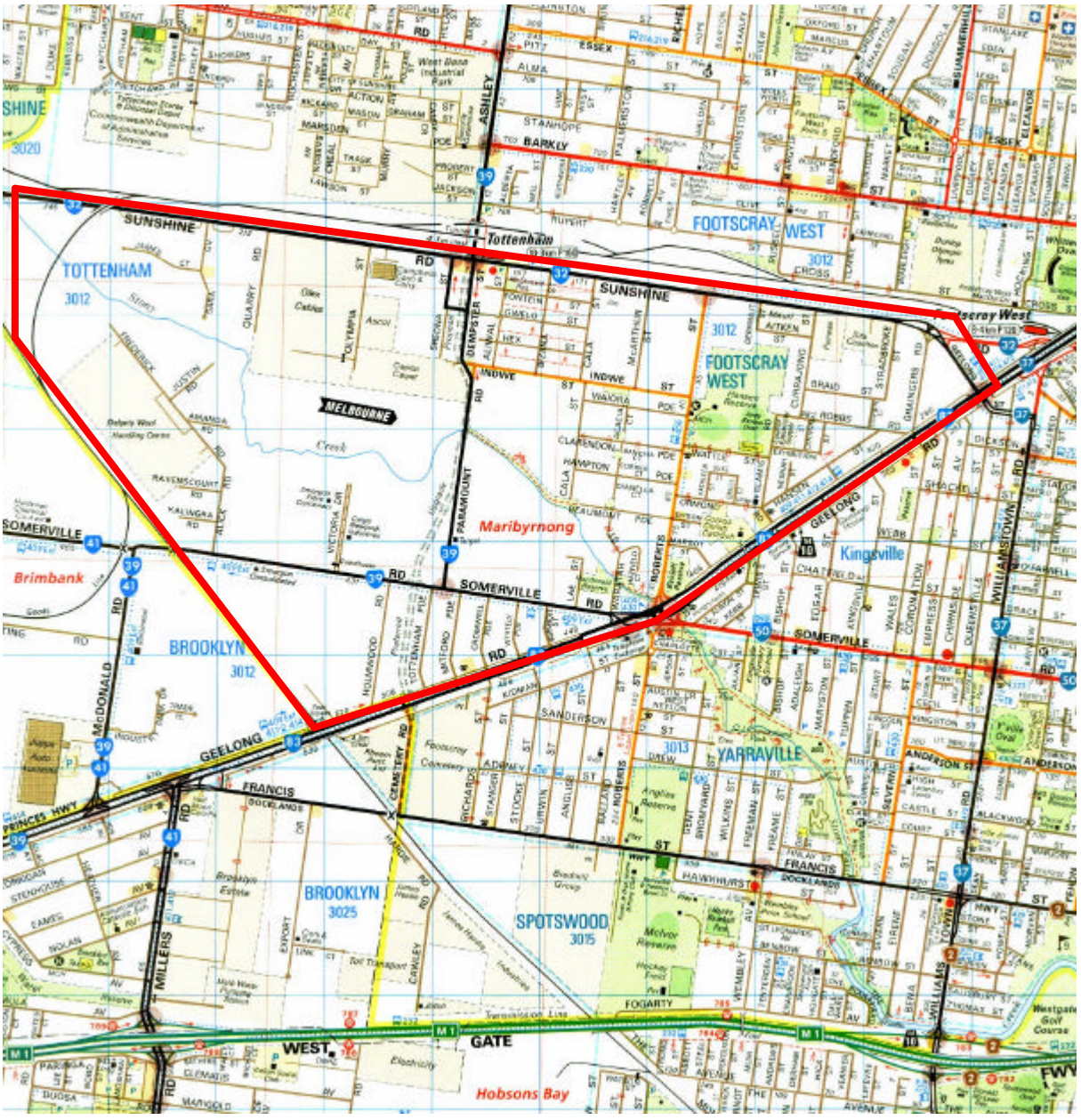
These findings, however, have not outlined a sampling program that may be used to determine whether the health of Stony Creek has improved as a result of the industry audit program.

PB understands that the health of Stony Creek is already monitored by the EPA on an annual basis. We can recommend that this testing regime be continued and that industries abutting the creek are encouraged to report any incidents to the EPA for follow-up.

Appendix A

Catchment Area Audited

Industry Audit Program – Stony Creek Catchment Area



Appendix B

List of Participants

List of Industry Audit Program Participants

Company	Group ID
ABS Aluminium Shop Fronts	7
Alltab Australia Pty Ltd	4
Amcor Fibre Packaging	4
Amcor PET Technologies	4
Apex Waste	3
Australian Wool Handlers	2
Austrans Container Service	2
Avery Dennison Materials Pty Ltd	4
Baker Containers	3
Belden Australia Pty Ltd	4
Boldiston Contractors	3
Bruce Griffiths & Sons	3
Bruce Johnson Transport Pty Ltd	3
Bulk Cargo Service Pty Ltd	2
Can't Tear Em	2
Cargill Grain & Oilseed Supply Chain Australia	5
Charles Tims Pty Ltd	4
Colours & Chemicals	6
Da Vale Diesel Injection Pty Ltd	1
Daysworth International Pty Ltd	1
Dove Transport & Storage Pty Ltd	3
Dynon Wools	2
Electro Air Industrial Supply	1
Faft Packaging	6
FBT Operations (Vic) Pty Ltd	3
Feltex Carpets	6
Flexible Ducting Australia	4
Gaffney Logistics	2
Gold Star Food Processing Pty Ltd	5
GUD	4
H&D Carda Engineering	1
Handiworks Fine Ceramics	4
Harry's Cabinets Pty Ltd	4
Inductabend Pty Ltd	7
Jacob Springs	1
JC Hydraulics	1
John Lee's Site	3
Kennards Hire	1
KSB Ajax Pumps Pty Ltd	4
Lee Perrins Truck & Diesel	1
Legend Nautilus	2
McInnes Engineering Pty Ltd	7
Goodman Fielder/ Meadow Lea Foods	5
Melcann Limited	3
Mitchells Wholesale Supplies	2
Olex Cables	4
Owens Melbourne Pty Ltd	3
PAK Australia	4

Company	Group ID
Pampas	5
Perfect Edge Body Repairs	1
Prism Paints & Colours Pty Ltd	6
PT Screen Printing Pty Ltd	6
Sadler Tiles	4
Sfida Sports International Pty Ltd	2
Simply Fruits	5
Smithweld	7
Spraying Systems Co	2
SS Springs	7
St Vincent De Paul	2
Superb Finish Smash Repairs	1
Toy Hatsu Wrecking	1
Umicore Australia Limited	6
Victorian Container Management	3
Vincent Food Distributors	5
Wattyl Australia Pty Ltd	6
Western Access Pty Ltd	1
Westside Carburetors	1
Win Plastics	4
Winnipeg Textiles	6

Appendix C

Industry Audit Questionnaire Proforma

Appendix D

Risk Assessment Proforma

Appendix E

Industry Audit Summaries

Due to confidentiality commitments made by the Council, these results are not provided for public viewing.

Appendix F

Summary of Audit Recommendations by Industry Type