Chapter 8

General conclusion

8.1 Findings in each chapter

In recent years, a niche market has evolved for contaminated properties. Valuers are from time to time instructed to value contaminated land. Valuation of contaminated land is a cross-disciplinary activity that requires knowledge in economics, environmental law, environmental planning, property management, identification and remediation of contaminated land, and valuation methods. In Chapter 1, the causes of land contamination were discussed and the impact of population and economic growth on land contamination was explored. It was found that the market mechanism alone could not prevent or control land contamination. Legal regulation has to be introduced to address the deficiency. In addition, there should be more effort to educate the people to prevent land contamination. In that Chapter, it was concluded that apart from market demand and the physical characteristics of the contaminated property, statutory regulations and stigma are two major factors that affect the property value. Valuers and other stakeholders need to have a clear understanding of these factors.

While it is true that science can determine if the land is affected by contamination, it is the relevant environmental laws that have the actual impacts on the land value. Chapter 2 gives an overview of current land contamination laws at federal level and in the three States. It was found that environmental laws have significant weight on the remediation costs, environmental audits, and environmental impact assessment. Further, the fact that a particular property is listed on the statutory contaminated land register may cause blighting impact on the property value. The impact was evident in the United Kingdom that there was vigorous opposition from landowners and financiers about the likely 'blighting' of land values (Lewis 1995). In Australia, the Queensland government experienced the same pressure such that it had to repeal the former Contaminated Land Act 1991 (Qld). These detrimental factors make government regulation one of the criteria for the determination of stigma. It should be noted that environmental laws are not all negative. There are financial incentives and grants to help the eligible parties to clean up, control and prevent land contamination. A valuer must consider all pro's and con's of the relevant legislation when valuing a contaminated or potentially contaminated property.

Environmental planning control is another statutory regulation that has a major impact on land which is contaminated or potentially contaminated. It is well known that the highest and best use of a parcel of land determines the market value. While the highest and best use of a property is determined by a number of factors, it is environmental planning approval that has the final say. If the necessary planning approval is not given, the highest and best use cannot be realised. Accordingly highest and best use is one of the determining factors of stigma. In addition to land use restrictions, environmental planning control may actually increase contaminated land value by rezoning the land to higher beneficial uses. Chapter 3 shows that where it is applicable, this is a better approach than the issue of clean up order under the relevant environmental laws. In the course of valuing contaminated land, a valuer needs to take into consideration this important fact. The probability that the land may be used for the next best use must be considered.

In general, contaminated properties have a bad image and not all contaminated properties have redevelopment potential. However, contaminated properties have caught the interest of investors in recent years because they can also bring about reasonable return. In Chapter 4, it was shown that the implementation of a properly prepared management program might turn a contaminated property into a valuable asset. In order to do so, the property manager should have thorough understanding of

land contamination issues. The traditional property management techniques have to be extended and modified to include an Environmental Management System (EMS) program. The quality of property management has a close relationship with the health risks on site and the remediation costs which are two major criteria of stigma determination. A valuer needs to consider the potential if the value of a contaminated property may be improved by proper management. The necessary costs to implement the management program have to be deducted from the unimpaired value of the property.

Regarding valuation methods, Chapter 5 shows that the majority of valuers in Australia are using conventional valuation methods with arbitrary adjustment to allow for the negative value impact due to land contamination. This is no different from their overseas counterparts. Property researchers have introduced a number of alternative methods to value contaminated land, but they are rarely used by valuers because the methods are either too academic or impractical.

Among all valuation methods, the impaired value (affected value) approach is by far the most popular method. Its popularity is due to the fact that the method is simple and logical, and is easily understood even by a layperson. The valuation principle is that the impaired value is equal to the balance of unimpaired value minus any financial losses due to land contamination, remediation and any long term monitoring costs, and value loss due to stigma. If the property is not affected by stigma, the valuer can easily assess the impaired value of the property with this approach. However, if stigma affects the property, the valuer will find it difficult to apply the approach because of the difficulty in quantifying stigma.

Stigma is the detrimental impact on property value due to the presence of a risk perception-driven market resistance. It affects the subject contaminated or potentially contaminated property, as well as clean properties that are close to a land contamination source. Although some researchers such as Mundy (1992a), Chalmers & Roehr (1993), Patchin (1994) and Syms (1996b) advocate the use of market data to assess stigma, it is difficult to use this method in reality. In real life, it is very rare that the relevant market data is available. Even if some market data is available, they may not be good comparables because each contaminated property is as unique as a "fingerprint". Other methods suggested by researchers are too academic and not practical as shown in Chapter 6.

In Australia, valuers adopt a number of methods, including zero adjustment, arbitrary adjustment, higher profit and risk factor, comparable evidence, lower loan to value ratio and percentage adjustment, to allow for stigma impact. While some experienced and competent valuers may be able to estimate an accurate stigma factor with these methods, the skill is difficult to master.

In Chapter 7, it was found that Australian valuers would consider 16 criteria to estimate stigma. Accordingly it is reasonable to look at the stigma issue from a multi-criteria decision-making (MCDM) point of view. In this thesis, the Analytic Hierarchy Process (AHP) is the chosen MCDM method. It is a well-established MCDM method that has been used in other property research. In this research, the 16 criteria used in the model are obtained from a survey of practising valuers in the three Australian States. Eleven (11) of the criteria are the same as those identified by Patchin and Mundy. In comparison, Australian valuers are more market-orientated and take real life situation into consideration. They have identified 5 extra criteria which cover normal valuation considerations such as land use, valuation purpose, market condition, government regulations, and listing on contaminated land register. It was proofed section 7.9 of Chapter 7 that they are significant factors. Accordingly the 16 criteria are considered reliable and acceptable. The alternatives in the model are probable stigma factors suggested by valuers. The model has been tested with real data from practising valuers.

In order to measure the reasonableness of probable stigma factors supplied by valuers, the figures are checked against benchmark figures (Table 7 – 2). The benchmark figures are the results from the same survey and reflect the respondents' average estimation of stigma impact for the particular class of land uses and industries. In the course of testing the model, the benchmark figures were not shown to the valuers so that they could not copy the benchmark figures. It was found that the probable stigma factors suggested in the case studies were in line with the benchmark figures. It indicates that the valuers' estimates were in line with market expectation. The test results showed that valuation results based on stigma factor returned by the AHP model has a high degree of consistency with the original valuations results. The objective that the model should reduce inconsistency has been achieved.

An important feature of the suggested AHP model is that it provides a structured and transparent decision making framework for the valuer. It requires the valuer to consider rating each of the criteria explicitly. This is a scientific and defensible approach in decision making. It is a suitable replacement for the current method of simple judgement based on experience ('guesstimation' or 'gut-feeling' method). Although there is no guarantee that a good method will necessarily gives a good outcome, there is a good chance that a good outcome can be achieved. Since the AHP model is not survey-based, valuers are not required to conduct a time-consuming survey for each valuation. This should be a feature welcomed by valuers.

The mathematics behind the AHP approach is rather involved. Fortunately, the appropriate software and computer available today can easily overcome this obstacle. Valuers need not have a deep understanding of the theory and mathematics of AHP. What they need to know is the principle behind it and how to apply the method properly. Critics may argue that this is a black box approach. This is in fact not a problem. As long as the theory is correct and the method is proven, it does not matter if the calculation is done manually by the valuer (if he or she knows how to do it) or done by the computer.

In comparison with other methods such as hedonic price method and contingency method, the suggested AHP method is more practical. The hedonic price method requires the availability of a large amount of data for the analysis. In real life situation, this requirement is difficult to meet. As far as the contingency method is concerned, it requires the conduct of one or more surveys. Since a survey may take considerable time to prepare, it is not practical for the day-to-day operation of a valuer who normally needs to submit the valuation report to the client within a few days.

In addition to that the AHP model does not requires a large amount of market data of contaminated property or the conduct of a survey, the model is time independent such that it can be used at any time once it is established. Nevertheless, it should be understood that the model is only a tool that assists the valuer to choose the appropriate stigma factor for the valuation. The valuer is still in charge of the whole valuation process and needs to exercise due care when using the model. The golden rule 'garbage in, garbage out' still applies.

8.2 Contributions of the research

Apart from introducing the AHP model to replace the 'guesstimation' approach, this research also has the following major contributions:

1. The research has provided a comprehensive overview of the relevant Australian and overseas environmental laws. There is also a comparison of the laws and an analysis of how the environmental laws affect land values.

2. The research is the first one in Australia to survey local councils in the Sydney metropolitan area in relation to how they treat contaminated land. The major findings in this regard are that local councils do not treat contaminated land differently and there is no set time frame for processing development applications of contaminated land. The latter finding implies that there may be extra uncertainty for proposals to redevelop contaminated land.

3. The research provides an overview of methods developed overseas for the assessment of contaminated land and stigma.

4. The research is also the first one in Australia to survey valuers to find out how they value contaminated land. There is a comparison of the Australian valuation methods and methods used overseas. It finds out that Australian valuers mainly use traditional methods to value contaminated land and they have a higher preference to use the unimpaired approach to value contaminated land.

5. The research is the first one in Australia to survey valuers to find out how they assess stigma and what are the criteria they consider when assessing stigma. There is a comparison of the Australian methods with the overseas methods. It was found that Australian valuers mainly use arbitrary methods to assess stigma.

6. The research results provide for the first time data (Table 7 – 2) about Australian valuers' perceived risks and percentage adjustment for different land uses and industries. It also finds out what criteria Australian valuers will consider when assessing stigma.

8.3 Limitations of the research

However, the research is not perfect. The pitfall lies mainly in the survey of valuers. Firstly, the number of respondents from Victoria and Queensland is small. If the valuer address list provided for the two States were as comprehensive as the New South Wales one, the survey could be conducted on a larger scale and in a more balanced manner. The result would be more representative and reliable. Unfortunately I have no access to the necessary address lists. The survey described in this thesis is the best that I was able to carry out. Secondly, this is a survey for a higher degree research. Many valuers were not willing to participate despite the fact that I mentioned that it is also for the benefit of the profession. Since the survey base is not satisfactory, the survey results are less representative.

Nevertheless there is sufficient evidence from this research that the suggested AHP model is a good complement to the impaired value approach. The impaired value approach allows valuers to use familiar valuation methods to assess the unimpaired value of contaminated land. Valuers need not to learn new valuation methods. With the help of the AHP model, the stigma factor can be easily assessed. The combination of the impaired value approach and the AHP stigma assessment model helps valuers assess contaminated land value confidently. Since the learning curve of using the suggested AHP approach is gentle, it meets the requirements that "the method must be easily understood and easy to use. Its theoretical soundness must be matched by a practical application." (Trott 1980 cited in Baum & Crosby 1989 p.128).

Although the model has a potential to be an alternative to the current 'guesstimation' approach, there is one caution to promoting the model to the practitioners. As mentioned above, the benchmark figures (Table 7 – 2) are used to check the reasonableness of the stigma factors suggested by valuers for individual case studies. This process is a necessary step in real life practice too. If the AHP model is accepted by the Australian Property Institute (or interested professional

body in other countries), the benchmark figures in Table 7 – 2 should be regularly updated to reflect the changing risk perception of the market towards individual contaminated land uses and industries. However, the publication of the benchmark figures in the relevant practice standard or guidelines may have a problem. Some valuers, for the purpose of expediency, may simply use the published benchmark figures in their valuation. This is dangerous because the benchmark figures are not site specific. The arbitrary adoption of the figures may lead to litigation for professional negligence. Accordingly, a suitable warning notice should accompany the publication of the benchmark figures.

It should be noted that the model presented in this study is not an ideal model. It only demonstrates that it is a workable method to assess stigma factor. In comparison with the 'guesstimation' or 'gut-feeling' approach, it provides valuers with a more structured framework upon which they can build a more detailed model to suit their individual needs. In Chapter 7, it was mentioned that the suggested AHP approach also has a potential to be applied to estimate other valuation elements such as rental, prices, yields, etc. Given the advantages of the AHP approach, the Australian Property Institute (or other interested overseas professional bodies) should seriously consider introducing this method to the members. However, in view of that the findings of this research are subject to the aforesaid limitations, it is suggested that the Institute should fund more in depth researches to verify the validity of the method.

Appendices

Copy of Presented/Published Papers

Appendix I

Sydney Metropolitan Councils Survey Questionnaire 1996

Re: Environmental Planning Control of Contaminated Land

30 August 1996

«JobTitle»
«Company»
«Address1», «City»
«State», «PostalCode»

Dear Sir,

Re: Research on Contaminated Land

I am a lecturer of the University of Western Sydney, Hawkesbury and am doing a research on contaminated land. The aims of this research are to study the adequacy of the current environmental planning control on contaminated land and identify possible ways for improvement. The research requires me to obtain relevant information from your council area for analysis. Accordingly I should be grateful if you could kindly complete the attached questionnaire and return it to me on or before Saturday 21 September 1996 using the enclosed pre-paid envelop.

The information will be used strictly for academic research purposes and will be destroyed as soon as the research is completed. If you have any queries, please contact me on 02 9852 4212 during office hours. Thank you.

Yours sincerely,

Nelson CHAN
Lecturer, Valuation
School of Land Economy

Questionnaire

Please answer the following questions according to the situation within your council area. If the space provided is insufficient, please use separate sheets for the answers,

For your information, a contaminated site is defined in the Australian And New Zealand Guidelines For The Assessment And Management Of Contaminated Sites as "a site at which hazardous substances occur at concentrations above background levels and where assessment indicates it poses, or is likely to pose an immediate or long term hazard to human health or the environment." (ANZECC & NHMRC. P 2. 1992)

General Questions

1. What is the population in your council area?

   _____

2. How big is the council area?
   _____ha

3. Is there any contaminated land within the council area?
   [yes] [no]

4. If yes, please provide separate information to the following

Contaminated land	Potentially contaminated land
Number of sites : _____ No.	Number of sites : _____No.
Total area : _____ ha	Total area : _____ha

5. Does the council treat contaminated and potentially contaminated land differently?
   [yes] [no]

6. How does the council know about a piece of land is contaminated?

_____

_____

_____

_____

_____

_____

_____

_____

_____

7. Who determines the degree of contamination?

8. What are the causes of land contamination in the council area?

9. Does the council keep a register of contaminated land?
[yes] [no]

10. If yes, does the public have access to the register?
[yes] [no]

Environmental Planning Questions

11. How many development applications were there in the past ten years?
_____applications

12. How many of them were for industrial development?
_____applications

13. How many development applications were rejected on the ground that the land was or potentially contaminated?

Year ending	Applications	Year ending	Applications
June 1987		June 1992	
June 1988		June 1993	
June 1989		June 1994	
June 1990		June 1995	
June 1991		June 1996	

14. How many rezoning applications were there in the past ten years?
_____applications

15. How many rezoning applications were approved?
_____applications

16. How many were about rezoning from industrial use to more sensitive use like residential and commercial?

Year ending	Applications	Year ending	Applications
June 1987		June 1992	
June 1988		June 1993	
June 1989		June 1994	
June 1990		June 1995	
June 1991		June 1996	

17. How many rezoning applications were rejected on the ground that the land was or potentially contaminated?

Year ending	Applications	Year ending	Applications
June 1987		June 1992	
June 1988		June 1993	
June 1989		June 1994	
June 1990		June 1995	
June 1991		June 1996	

18. Were there any occasions that applications were approved despite the fact that the land was or potentially contaminated?
_____occasions

19. If approvals were granted in Q. 18, what were the common conditions attached to the approvals?

_____

_____

_____

_____

_____

_____

_____

_____

_____

20. Are applicants for development approval or rezoning required to expressly state if the land is or potentially contaminated?
[yes] [no]

21. Does the current environmental planning law adequately empower the council to deal with non-conforming use (existing use) which may cause land contamination under the existing environmental planning legislation? If yes, how?

22. Is there an obligation that the council should inform an applicant for a s. 149 certificate about contamination or potential contamination in the subject land?
[yes] [no]

23. When dealing with applications concerning contaminated or potentially contaminated land, does the council require assistance from other government departments or agencies, if yes, who are they?

24. When making a decision in respect of development approval and rezoning applications, what weighting is given to the advice/comments from other government departments or agencies?

25. Is the existing Environmental Impact Statement provision adequate to control/prevent land contamination?
[yes] [no]

26. If no, how can it be improved?

27. Normally how long does it take to approve or reject a development/rezoning application, in particular, in respect of contaminated / potenitally contaminated land?

28. What weighting is given to the "Planning Guidelines for Contaminated Land" published by the Department of Urban Affairs and Planning and the NSW Environment Protection Authority?

29. Are you satisfied with the council's performance in reduceing/controlling land contamination? Why?

30. Is the power under the existing environmental planning law adequate to deal with applications involving contaminated or potentially contaminated land ? If not, what improvement or extra power is needed?

31. Does the existing environmental planning system give the public sufficient opportunity to participate in environmental planning control on land contamination issues?
[yes] [no]

32. If no, how can the situation be improved?

33. Could you provide information for a case study?
[yes] [no]

34. If yes, please provide the name and phone number of the best contact person in the council for further information.

End of Questions
Thank you for your cooperation.

Reminder Letter

30 September 1996

«JobTitle»
«Company»
«Address1», «City»
«State», «PostalCode»

Dear Sir,

Re: Research on Contaminated Land

I am a lecturer of the University of Western Sydney, Hawkesbury and am doing a research on contaminated land. The aims of this research are to study the adequacy of the current environmental planning control on contaminated land and identify possible ways for improvement. I sent you a copy of questionnaire on 30 August 1996 requesting your assistance to provide the necessary information for me to carry out research. So far I have not received a reply from you.

I understand you are busy but I still hope that you can spend some time to complete the survey document and return it to me. Without your help, I cannot finish the research.

The information will be used strictly for academic research purposes and will be destroyed as soon as the research is completed. If you have any queries, please contact me on 02 9852 4212 during office hours. Thank you.

Yours sincerely,

Nelson CHAN
Lecturer, Valuation
School of Land Economy

Appendix II

Sydney Metropolitan Councils Survey Questionnaire 2001

Re: Environmental Planning Control of Contaminated Land

14 February 2001

The General Manager
«Company»
«Address1», «City»
«State» «PostalCode»

Dear Sir,

Re: Research on Environmental Planning Control of Contaminated Land

Thank you for your response to my survey in August 1996. Based on your feedbacks and my research, a paper "The Impact of Environmental Planning on The Value of Contaminated Land" was presented at the 4th Pacific Rim Real Estate Society Annual Conference at Curtin University, Perth in January 1998. The paper was subsequently published in Australian Land Economics Review in 1999. A copy of the published paper is attached for your information.

It has been more than 4 years since the last survey. I would like to see if there is any change since then. Accordingly I want you to help me again by completing the attached questionnaire. The questionnaire essentially contains the same questions as before apart from some minor updates. Please pass it to the person who responded to the last survey such that a contrast can be made between the two responses. If that person has left the council, please pass the questionnaire to his or her successor for response. I should be grateful if you can return the questionnaire to me within two weeks from the date of this letter.

Like the last survey, your response will be strictly used for academic research and will be destroyed afterwards. If you have any queries about this survey, please feel free to contact me on 02 – 9852 4212.

Once again, thank you for your time and support to my research.

Yours sincerely,

Nelson Chan
Valuation Lecturer
School of Construction, Property and Planning
College of Law and Business

Questionnaire for Councils

Please answer the following questions according to the situation within your council area. If the space provided is insufficient, please use separate sheets for the answers,

For your information, a contaminated site is defined in the Australian And New Zealand Guidelines For The Assessment And Management Of Contaminated Sites as "a site at which hazardous substances occur at concentrations above background levels and where assessment indicates it poses, or is likely to pose an immediate or long term hazard to human health or the environment." (ANZECC & NHMRC. P 2. 1992)

General Questions

1. What is the population in your council area?

   _____

2. How big is the council area?

   _____km^2

3. Is there any contaminated land within the council area?

   [yes] [no]

   If [no], go to Question 5.

4. If yes, please provide separate information to the following.

Contaminated land	Potentially contaminated land
Number of sites : _____ No.	Number of sites : _____No.
Total area : _____ ha	Total area : _____ha

5. Does the council treat contaminated and potentially contaminated land differently?
   [yes] [no]

6. How does the council know about a piece of land is contaminated?

_____

_____

_____

_____

7. Who determines the degree of contamination?

8. What are the causes of land contamination in the council area?

9. Does the council keep a register of contaminated land?

[yes] [no]

10. If yes, does the public have access to the register?
[yes] [no]

Environmental Planning Questions

11. How many development applications were there in the past ten years?

_____applications

12. How many of them were for industrial development?

_____applications

13. How many development applications were rejected on the ground that the land was or potentially contaminated?

Year ending	Applications	Year ending	Applications
February 1991		February 1996	
February 1992		February 1997	
February 1993		February 1998	
February 1994		February 1999	
February 1995		February 2000	

14. How many rezoning applications were there in the past ten years?

_____applications

15. How many rezoning applications were approved?

_____applications

16. How many were about rezoning from industrial use to more sensitive use like residential and commercial?

Year ending	Applications	Year ending	Applications
February 1991		February 1996	
February 1992		February 1997	
February 1993		February 1998	
February 1994		February 1999	
February 1995		February 2000	

17. How many rezoning applications were rejected on the ground that the land was or potentially contaminated?

Year ending	Applications	Year ending	Applications
February 1991		February 1996	
February 1992		February 1997	
February 1993		February 1998	
February 1994		February 1999	
February 1995		February 2000	

18. Had there been any occasions that applications were approved despite the fact that the land was or potentially contaminated?

_____occasions

19. If approvals were granted in Q. 18, what were the common conditions attached to the approvals?

20. Are applicants for development approval or rezoning required to expressly state if the land is or potentially contaminated?

[yes] [no]

21. Does the current environmental planning law adequately empower the council to deal with non-conforming use (existing use) which may cause land contamination under the existing environmental planning legislation? If yes, how?

22. Is there an obligation that the council should inform an applicant for a s. 149 certificate about contamination or potential contamination in the subject land?

[yes] [no]

23. When dealing with applications concerning contaminated or potentially contaminated land, does the council require assistance from other government departments or agencies, if yes, who are they?

24. When making a decision in respect of development approval and rezoning applications, what weighting is given to the advice/comments from other government departments or agencies?

25. Is the existing Environmental Impact Statement provision adequate to control/prevent land contamination?
[yes] [no]

26. If no, how can it be improved?

27. Normally how long does it take to approve or reject a development/rezoning application, in particular, in respect of contaminated / potentially contaminated land?

28. What weighting is given to the "Planning Guidelines for Contaminated Land" published by the Department of Urban Affairs and Planning and the NSW Environment Protection Authority?

29. Are you satisfied with the council's performance in reducing/controlling land contamination? Why?

30. Is the power under the existing environmental planning law adequate to deal with applications involving contaminated or potentially contaminated land? If not, what improvement or extra power is needed?

31. Does the existing environmental planning system give the public sufficient opportunity to participate in environmental planning control on land contamination issues?

[yes] [no]

32. If no, how can the situation be improved?

33. Could you provide information for a case study?

[yes] [no]

34. If yes, please provide the name and phone number of the best contact person in the council for further information.

End of Questions
Thank you for your cooperation.

Reminder Letter

7 March 2001

The General Manager
«Company»
«Address1», «City»
«State», «PostalCode»

Dear Sir

Re: Research on Environmental Planning Control of Contaminated Land

How are you? I sent you on 14 February 2001 a copy of questionnaire about the captioned research. So far I have not received a reply from you. I know you are very busy with your business. Nevertheless, please support me again by completing the questionnaire and return it to me as soon as possible. Without your help, I cannot complete the research. If you have any queries, please contact me on 02 9852 4212 for discussion.

If you have already returned the completed questionnaire to me, please ignore this letter. Thank you for your time and support.

Yours sincerely,

Nelson Chan
Valuation Lecturer
School of Construction, Property and Planning
College of Law and Business

Appendix III

NSW Valuers Survey Questionnaire 2001

Re: Environmental Planning Control of Contaminated Land

14 February 2001

«Title» «FirstName» «LastName»
«Company»
«Address1»
«City», «State», «PostalCode»

Dear «FirstName»,

Re: Research on Environmental Planning Control of Contaminated Land

Thank you for your response to my survey in 1998. Based on your feedbacks and my research, two papers "How Australian Appraisers Assess Contaminated Land" and "Turning Contaminated Land into A valuable Asset" were in the Appraisal Journal in the USA and the Australian Property Journal in Australia. If you do not have access to these papers and want to read them, please let me know and I will send you a copy.

In 1996 I conducted a survey of local councils in Sydney about their views on contaminated land issues. A paper "The Impact of Environmental Planning Control on Contaminated Land Value" was published in the Australian Land Economics Review, a copy is attached for you information. This time, apart from the views of councils, I would like to have opinions from valuers for contrast. Accordingly I want you to help me again by completing the attached questionnaire. Please answer the questions accordingly to your personal experience and opinion. I should be grateful if you can return the questionnaire to me within two weeks from the date of this letter. A prepaid return envelope is enclosed.

Like the last survey, your response will be strictly used for academic research and will be destroyed afterwards. If you have any queries about this survey, please feel free to contact me on 02 – 9852 4212.

Once again, thank you for your time and support to my research.

Yours sincerely,

Nelson Chan
Valuation Lecturer
School of Construction, Property and Planning
College of Law and Business

Questionnaire for Valuers

Please answer the following questions according to your experience and understanding of the environmental planning control of contaminated land. If the space provided is insufficient, please use separate sheets for the answers,

For your information, a contaminated site is defined in the Australian And New Zealand Guidelines For The Assessment And Management Of Contaminated Sites as "a site at which hazardous substances occur at concentrations above background levels and where assessment indicates it poses, or is likely to pose an immediate or long term hazard to human health or the environment." (ANZECC & NHMRC. P 2. 1992)

General Questions

1. Does the council treat contaminated and potentially contaminated land differently?

   [yes] [no]

2. How does the council know about a piece of land is contaminated?

3. Who determines the degree of contamination?

4. Does the council keep a register of contaminated land?

   [yes] [no]

   If no, go to Question 6.

5. If yes, does the public have access to the register?

   [yes] [no]

Environmental Planning Questions

6. Have you been involved in any contaminated land development applications in the past ten years?

   Yes, _____applications

   If no, go to Question 9

7. How many of them were for industrial development?
   _____applications

8. How many development applications were rejected on the ground that the land was or potentially contaminated?

   _____applications

9. Have been involved in any contaminated land rezoning application in the past ten years?

   Yes, _____applications

   If no, go to Question 13

10. How many rezoning applications were approved?
    _____applications

11. How many were about rezoning from industrial use to more sensitive use like residential and commercial?

    Residential: _____applications Commercial: _____applications

12. How many rezoning applications were rejected on the ground that the land was or potentially contaminated?

    _____applications

13. Had there been any occasions that applications were approved despite the fact that the land was or potentially contaminated?

    _____occasions

14. If approvals were granted in Q. 13, what were the common conditions attached to the approvals?

15. Are applicants for development approval or rezoning required to expressly state if the land is or potentially contaminated?

[yes] [no]

16. Does the current environmental planning law adequately empower the council to deal with non-conforming use (existing use) which may cause land contamination under the existing environmental planning legislation? If yes, how?

17. Is there an obligation that the council should inform an applicant for a s. 149 certificate about contamination or potential contamination in the subject land?

[yes] [no]

18. From your experience, when dealing with applications concerning contaminated or potentially contaminated land, will the council get assistance from other government departments or agencies, if yes, who are they?

19. From your experience, when a council is making a decision in respect of development approval and rezoning applications, what weighting is given to the advice/comments from other government departments or agencies?

20. Is the existing Environmental Impact Statement provision adequate to control/prevent land contamination?

[yes] [no]

21. If no, how can it be improved?

22. From your experience, how long does it take to approve or reject a development/rezoning application, in particular, in respect of contaminated / potentially contaminated land?

23. When dealing with contaminated land planning application, do you refer to the "Planning Guidelines for Contaminated Land" published by the Department of Urban Affairs and Planning and the NSW Environment Protection Authority?

24. Are you satisfied with the council's performance in reducing/controlling land contamination? Why?

25. Is the power under the existing environmental planning law adequate to deal with applications involving contaminated or potentially contaminated land? If not, what improvement or extra power is needed?

26. Does the existing environmental planning system give the public sufficient opportunity to participate in environmental planning control on land contamination issues?

[yes] [no]

27. If no, how can the situation be improved?

End of Questions
Thank you for your cooperation.

Reminder Letter

7 March 2001

«Title» «FirstName» «LastName»
«Company»
«Address1»
«City», «State»,«PostalCode»

Dear «FirstName»,

Re: Research on Environmental Planning Control of Contaminated Land

How are you? I sent you on 14 February 2001 a copy of questionnaire about the captioned research. So far I have not received a reply from you. I know you are very busy with your business. Nevertheless, please support me again by completing the questionnaire and return it to me as soon as possible. Without your help, I cannot complete the research. If you have any queries, please contact me on 02 9852 4212 for discussion.

If you have already returned the completed questionnaire to me, please ignore this letter. Thank you for your time and support.

Yours sincerely,

Nelson Chan
Valuation Lecturer
School of Construction, Property and Planning
College of Law and Business

Appendix IV

NSW, Victoria & Queensland Valuers Survey Questionnaire 1998

Re: Valuation of Contaminated land, Stigma Perception & Criteria

23 March 1998

Dear Colleague,

Re: Research on Contaminated Land Valuation

I am a member of the Australian Institute of Valuers and Land Economists and a valuation lecturer of the BCom(Property Economics) course at the University of Western Sydney, Hawkesbury. At present I am doing a PhD program at the Macquarie University. My research topic is "Valuation of Contaminated Land". The NSW Division of the AIVLE has provided your contact details in support of my research.

Contaminated land has become a major environmental concern of the Australian people. At the same time more and more valuers are engaged in the valuation of contaminated land. Yet a specific valuation method is not available at present. My research is to find out the applicability of the current valuation methods, the associated problems and to derive a dedicated method for valuing contaminated land. In this connection, I need information from practicing valuers like you for the study. Please take 15 to 20 minutes to complete the attached questionnaire and return it to me on or before 20 April 1998 using the enclosed pre-paid envelope.

The information will be used strictly for academic research purposes and will be destroyed as soon as the research is completed. Apart from forming the contents of my thesis, the research outcome will be sent to *The Valuer And Land Economist* and other property journals for publication. If you have any queries about this survey, please contact me on 02 9852 4212 during office hours. I shall be happy to discuss the matter with you. Thank you.

Yours sincerely,

Nelson Chan
Valuation Lecturer
School of Land Economy

Questionnaire

Please answer the following questions according to your personal views and experience. If the space provided is insufficient, please use separate sheets for the answer. Thank you.

For your information, a contaminated site is defined as *"a site at which hazardous substances occur at concentrations above background levels and where assessment indicates it poses, or is likely to pose an immediate or long term hazard to human or the environment"* (ANZECC & NHMRC, 1992)

In this survey, contaminated land shall include all real estates/properties that are contaminated or potentially contaminated.

Please check the empty boxes [ ] with an "x", you may check more than one box where necessary. Please circle the [Yes] and [No] boxes as appropriate.

A. General

1. Please provide the following information (**Optional**):

   Name: Position:

   Company:

   Phone: Fax:

2. Have you been involved in any valuation of contaminated land?

   [yes] [no]

   If "no", please go to 6.

3. How many contaminated land valuations have you done so far?

   _____ cases.

4. Of your annual workload, what percentage is occupied by valuation of contaminated land?

   _____%

5. In what year did you first value contaminated land?

   19_____.

   Please go to Section B.

6. Please pass the cover letter and this questionnaire to a friend or colleague who has valued contaminated land. Thank you.

B. The "Contaminated Land Practice Standard"

1. Are you aware that the "Contaminated Land Practice Standard" was published in February 1994 by the AIVLE?

   [Yes] [No]

2. Do you refer to this document when valuing contaminated land?

   [Yes] [No]

3. Do you follow the valuation approaches outlined in the document?

   [Yes] [No]

4. Do you think the valuation approaches reflect real life practice?

   [Yes] [No]

5. Do you find the contents of this document helpful/practical?

   [Yes] [No]

6. What improvements should be made to this document?

_____

_____

_____

_____

_____

_____

C. Valuation Questions

1. Do you treat contaminated land as a special class of real estate?

   [Yes] [No]

2. In your opinion, what makes valuation of contaminated land difficult?

_____

_____

_____

_____

_____

_____

3. How do you overcome the difficulties?

4. When valuing contaminated land, what concerns do you have?

5. What factors do you take into account when valuing contaminated land?

6. Do you work with an environmental auditor/consultant for each contaminated land valuation?

[Yes] [No]

If yes, who nominates the environmental auditor/consultant?

a. client [ ]
b. yourself [ ]
c. others, please specify [ ]

7. What contribution does an environmental auditor/consultant make to your valuation?

8. What contaminants are generally found in/on the land that you have valued?

9. Does the type of contaminant found in/on the land have any impact on the valuation?

[Yes] [No]

If yes, please explain why:

10. What approach/basis of valuation do you use to value a contaminated property?

a. Unaffected Valuation Basis [ ]
b. Affected Valuation Basis [ ]
c. Environmental Balance Sheet Approach [ ]
d. Comparative Approach [ ]
e. Others, please specify: [ ]

11. If clean up cost is an element of your valuation, please specify its composition.

12. Where do you get the clean up cost figures?

13. Stigma is the value loss due to the fear that there are long term health problems and legal liabilities from harmful residue left behind after remediation of a contaminated property. Are your clients concerned about the impact of stigma?

[Yes] [No]

14. Have you taken stigma into consideration when valuing contaminated land?

[Yes] [No]

15. In a valuation of contaminated land, how do you account for the impact of stigma?

a. using an arbitrary discount rate [ ]
b. using a percentage adjustment [ ]
c. using a lump sum adjustment [ ]
d. other method, please specify: [ ]

} Please specify in the space below how the adjustment is made, including the range of % and lump sum amount.

16. Is there any way to reduce the impact of stigma on contaminated land value?

[Yes] [No]

If yes, please explain how:

D. Valuation Method

1. Which of the following valuation methods do you use for valuation of contaminated property?

a. comparison method [ ]
b. capitalisation method [ ]
c. cost approach [ ]
d. hypothetical development method [ ]
e. accounts method [ ]
f. DCF method [ ]
g. None of the above [ ]

2. Do you think the valuation methods listed in Question 1 above are suitable for valuation of contaminated land?

[Yes] [No]

If no, please explain why:

3. Can the said valuation methods be improved/adapted to value contaminated land?

[Yes] [No]

If yes, please explain how:

4. Do you think there should be a dedicated method for valuing contaminated property?

[Yes] [No]

If yes, please specify the requirements for this valuation method:

5. If a dedicated valuation method is introduced, would you be interested in testing this method?

[Yes] [No]

E. Case Study

1. Can you provided data for a case study? (Information about you client is not required)

   [Yes] [No]

   If no, please go to 3.

2. If you have not provided information in Question 1 of Section A, please put down you name, phone number, and fax number here so that I can contact you for the information.

   _____

   _____

3. This is the end of the survey, thank you for your time and assistance.

----- End -----

Reminder Letter

28 April, 1998

Dear Colleague,

How are you?

I sent you a questionnaire last month in connection with my research on "Valuation of Contaminated Land". I requested you to return it to me on or before 20 April, 1998. Today I have not yet received the document from you. Your feedback to the questionnaire is very important to my research. As such I should be grateful if you could spend 15 to 20 minutes to complete the questionnaire and return it to me. If you have lost the document, please ring me on 02 9852 4212 during office hours and I will send a replacement copy to you.

If you have already returned the document to me, please disregard this letter. I very much appreciate you support to my research. Thank you.

Yours sincerely,

Nelson Chan
Valuation Lecturer
Faculty of Management

Interview Questions

Interview Questions

Q1. From your experience, has stigma ever caused any concern among buyers, seller and financiers?

Y ☐ N ☐

Q2. From your experience, in general, how close is the transaction price to the valuation?

_____ %

Q3. The following are **specific industries and land uses associated with site contamination** listed in the *Contaminated Land Practice Standard* (Source: Australian Institute of Valuers and Land Economists, 1994)

Please indicate the percentage reduction in value due to stigma effect for each of the following former land uses.

	Proposed end use		
	Res.	Com.	Ind.
1. Abattoirs and Animal Processing Works	____%	____%	____%
2. Acid/alkali plant and formulation	____%	____%	____%
3. Agricultural Activities (Vineyards, Tobacco, Sheep Dips, Market Gardens)	____%	____%	____%
4. Airports	____%	____%	____%
5. Alumina Refinery Residue Disposal Areas	____%	____%	____%
6. Asbestos production, and disposal	____%	____%	____%
7. By-Product Animal Rendering	____%	____%	____%
8. Bottling Works	____%	____%	____%
9. Breweries	____%	____%	____%
10. Brickworks	____%	____%	____%
11. Car Wreckers	____%	____%	____%
12. Cement Works	____%	____%	____%
13. Cemeteries	____%	____%	____%
14. Ceramic Works	____%	____%	____%
15. Chemicals manufacture and formulation	____%	____%	____%
16. Coal Mines and Preparation Plants	____%	____%	____%
17. Defence Works	____%	____%	____%
18. Docks	____%	____%	____%
19. Drum Reconditioning Works	____%	____%	____%

20. Dry Cleaning Establishments	____%	____%	____%
21. Electricity Distribution	____%	____%	____%
22. Electroplating and Heat Treatment Premises	____%	____%	____%
23. Ethanol Production Plants	____%	____%	____%
24. Engine works	____%	____%	____%
25. Explosives industries	____%	____%	____%
26. Fertiliser Manufacturing Plants	____%	____%	____%
27. Gas works	____%	____%	____%
28. Glass Manufacturing Works	____%	____%	____%
29. Horticulture/Orchards	____%	____%	____%
30. Industrial Tailings Ponds	____%	____%	____%
31. Iron and Steel Works	____%	____%	____%
32. Landfill Sites	____%	____%	____%
33. Lime Works	____%	____%	____%
34. Marinas and Associated Boat Yards	____%	____%	____%
35. Metal treatment	____%	____%	____%
36. Mineral Sand Dumps	____%	____%	____%
37. Mining and Extractive Industries	____%	____%	____%
38. Munitions Testing and Production Sites	____%	____%	____%
39. Oil Production, Treatment and Storage	____%	____%	____%
40. Paint Formulation and Manufacture	____%	____%	____%
41. Pesticide Manufacture and Formulation	____%	____%	____%
42. Pharmaceutical Manufacture and Formulation	____%	____%	____%
43. Photographic Developers	____%	____%	____%
44. Piggeries	____%	____%	____%
45. Plant Nurseries	____%	____%	____%
46. Plastic or Fibreglass	____%	____%	____%
47. Power Stations	____%	____%	____%
48. Prescribed Waste Treatment and Storage Facilities	____%	____%	____%
49. Printed Circuit Board Manufacturers	____%	____%	____%
50. Properties Containing Underground Storage Tanks	____%	____%	____%
51. Radioactive Materials, Use or Disposal	____%	____%	____%
52. Railway Yards	____%	____%	____%
53. Research Laboratories	____%	____%	____%
54. Sawmills and Joinery Works	____%	____%	____%

55. Scrap Yards	____%	____%	____%
56. Service Stations	____%	____%	____%
57. Sewerage Works	____%	____%	____%
58. Smelting and Refining	____%	____%	____%
59. Sugarmill or Refinery	____%	____%	____%
60. Tanning and Associated Trades (eg Fellmongery)	____%	____%	____%
61. Timber Treatment Works	____%	____%	____%
62. Transport/Storage Depots	____%	____%	____%
63. Tyre Manufacturing and Retreading Works	____%	____%	____%
64. Waste Treatment Plants in which Solid, Liquid Chemical, Oil, Petroleum or Hospital Wastes are Incinerated, Crushed, Stored, Processed, Recovered or Disposed of.	____%	____%	____%
65. Wood Storage Treatment	____%	____%	____%
66. Wood Treatment Facility	____%	____%	____%
67. Wood Preservation	____%	____%	____%

Q4. From a macroscopic view, please state the percentage range of value adjustment for stigma effect for the following alternative land uses.

a) residential: _____% to _____%

b) commercial: _____% to _____%

c) industrial: _____% to _____%

Q5. What factors do you consider when making stigma effect adjustment?

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

g) Others, please specify:

_____

Q6. To each of the above factors, please assign a percentage weighting according to their relative importance that makes up the stigma effect value adjustment:

Factors	Residential	Commercial	Industrial
a			
b			
c			
d			
e			
f			
g			
Total	100%	100%	100%

Q7. The followings are stigma effect factors reported in the literature. Please tick (✓) the box next to the factors that you think are relevant in Australia.

a) Fear of hidden clean-up cost ❒
- liability to clean up residue contaminants.

b) Trouble factor ❒
- the trouble of having to arrange for remediation.

c) Fear of public liability ❒
- there may be potential liability in the future.

d) Mortgageability ❒
- financiers are reluctant to lend.

e) Disruption ❒
- disruption to day to day business operation/activities.

f) Concealability ❒
- if the contamination is publicised.

g) Aesthetic effect ❒
- if the contamination can be seen from outside the property.

h) Responsibility ❒
- who was the polluter.

i) Prognosis ❒
- severity and persistence of contamination.

j) Degree of peril ❒
- impact on the human health and the environment.

k) Level of fear ❒
- how people see the risk.

Q8. To each of the above relevant factors, please assign a percentage weighting according to their relative importance that makes up the stigma effect value adjustment.

Relevant factors	Residential	Commercial	Industrial
a			
b			
c			
d			
e			
f			
g			
h			
i			
j			

k			
Total	100%	100%	100%

Q9. Please nominate a contaminated site that you have valued or come across for a case study. It is required to test if the new valuation model works. The following information is needed:

a. Brief description of the property:

Location:

Area:

b. Former use(s).

c. Contaminants involved:

d. Proposed use.

e. Clean land value.

f. Remediation and associated costs.

g. Stigma adjustment percentage.

h. Contaminated land value.

End of Interview

Thank you for your time and assistance

Appendix V

Case Study Requisition Questionnaire 1999

Re: Case Study for Testing Stigma Assessment Model

25 October 1999

«Title» «FirstName» «LastName»
«Company»
«Address1», «City»
«State», «PostalCode»

Dear «FirstName»:

Thank you for your participation in the survey in 1998. Based on your information and my research, a paper "Contaminated Land Valuation Methods – An Overview" has been completed and submitted to the Australian Property Journal for consideration. A copy is attached for your information. Your are welcome to send me comments and criticisms, which will be considered for incorporation into the paper together with the referees' comments.

My research has reached an advanced stage. Based on the earlier research findings, it is proposed to use a multi-criteria scoring model to assess stigma impacts and I need to test the validity of this method. For this, I need you help and support again. Please nominate a contaminated site that you have valued or come across using the impaired value approach for a case study. I attach for you information and action the following documents:

A. Plain English Statement for Participants
B. Background information sheet
C. Questionnaire for the current survey

Please sign one of the two copies of Plain English Statement for Participants and return to it to me together with the completed Questionnaire within 2 weeks. If you have any problems or queries, please do not hesitate to contact me on 02 9852 4212 (W) or 02 9852 4185 (Fax). You may also send me an e-mail at "n.chan@uws.edu.au".

The information supplied by you will be strictly used for academic research and will be destroyed afterwards. The results of this survey will be published in a property journal. If you need a personal copy of the paper, please let me know.

Once again I would like to thank you for your time and support.

Yours sincerely,

Nelson Chan
Valuation Lecturer
Property Group, Faculty of Management

Plain English Statement For Participants

1. Purpose of the research

This research is aimed at deriving a solid and efficient method for valuation of contaminated land. At present, in applying the impaired value approach to value contaminated land, the most difficult part is to assess the value loss due to stigma impacts. Yet a satisfactory stigma assessment method is not available. This research is intended to fill the gap by searching for a suitable method for assessing stigma impacts and hence improves the accuracy of contaminated land valuation. In this connection, I need information from practicing valuers like you for the study.

2. Discomfort and possible hazards involved

You may feel uneasy in participating in this research that information about you client will be disclosed and/or that your previous contaminated land valuation may be proved to be incorrect. This research is about valuation method, as such, you client's information not required. In addition, this research is not about verification of valuation errors, the accuracy of your previous valuations will not be investigated.

3. How much time is needed?

About the 45 minutes for the questionnaires. If you are based in Sydney and prefer to talk to me in person, please let me know and I will come to see you at your office for a interview for about 30 – 45 minutes.

4. Withdrawal and Discontinuity

You are free to withdraw consent and to discontinue participation in the activity at any time.

5. Other concerns

Your business or career will not be prejudiced in any way by your refusal to participate.

6. Questions about this research

Any questions concerning this project "Valuation of Contaminated Land" can be directed to me, Mr. Nelson Chan, of the Faculty of Management, University of Western Sydney, Hawkesbury on 02 9852 4212.

You may also contact Ms. Sharon Falleiro, the Executive Office, Human Research Ethics Committee, Research, Consultancy and Postgraduate Development Unit,

University of Western Sydney, Hawkesbury on 02 4570 1688 to voice your concern or lodge an independent complaint.

7. Agreement to take part in the research:

I _____ have read the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I may withdraw at any time. I agree that research data gathered for the study may be published, provided my name is not used.

.....

Participant or Authorised Representative Date

.....

Investigator Date

Background information

Basic model:
The impaired value approach is a well-established model for valuing contaminated land:

Impaired value = Unimpaired value – financial losses due to contamination – remediation cost – Stigma impacts

Problem
Valuers generally have no problem with assessing the unimpaired value of the uncontaminated land value. The financial losses and remediation cost again cause no problem as they are supplied by the client and environmental consultant respectively. The most difficult part is to assess the stigma impacts.

From the previous survey, it is found that valuers consider the following factors while estimating the stigma impacts:

1. Land uses – previous uses (incl. accuracy of site history), current use, proposed use.
2. Health risks – continuous problems, known problems, future problems (incl. residual contaminants).
3. Contamination – type, degree, toxicity, ground water affected.
4. Remediation – cost, quality, cleaned up by whom, any sign off environmental audit report.
5. Legal liability – under sale/lease contract, any previous claims, potential claims.
6. Publicity/reputation of site – media exposure, odour, visibility.
7. Market conditions – supply, demand, property value, economic factors, demography.
8. Physical features of site – location, dimensions, contour, facilities, proximity of adjoining properties.
9. Time factor – time lapse since cessation of contaminated uses, time required for clean up, length of previous contaminated uses.
10. Government regulation – council restriction and attitude.
11. Listing / ranking on contaminated land register.
12. Guarantee from vendor.
13. Ownership – who was the previous and current owner.
14. Community feeling / perceived risk.
15. Mortgageability.
16. Purpose of valuation.

Proposed method

It is obvious that the estimation of stigma impacts involved a multi-criteria decision making process. Accordingly a multi-criteria scoring model is suggested to assess stigma impacts. This method helps valuers select an appropriate value reduction percentage rate for stigma with regard to the different criteria.

Assumptions

1. The stigma value loss is a function of the unimpaired value.
2. The stigma value loss can be expressed as a percentage reduction of the unimpaired value.
3. The valuer is able to roughly estimate a range of percentage reduction from experience using the best case/worst case approach.
4. The value reduction percentages are the alternatives in the multi-criteria decision making model.

Information Required

Please nominate a contaminated site with stigma concern for a case study. The property should be one that you have valued or come across using the impaired value approach. The following information is required to test if the new valuation model works.

a. Brief description of the property

Location:

Area (m^2):

Buildings on site:

Zoning:

b. Former use(s).

c. Current use:

d. Proposed / alternative use:

e. Adjoining land uses:

f. Contaminants involved:

g. Unimpaired (clean) land value:

h. Financial losses due of land contamination:

i. Remediation and associated costs:

j. Guarantee from vendor: Yes / No If yes, please give details: _____

_____

k. Stigma adjustment percentage used:

l. Impaired (contaminated) land value assessed:

m. Amount sold for:

Note: There may not be financial losses due to land contamination in your case. Omit this item where appropriate.

Information needed to test the new method

Assuming you are to value the property again, please make the following estimates:

A. Please estimate the stigma value reduction percentage (as a % of the unimpaired value).

a. Best case: _____% b. Likely case _____% c. Worst case: _____%

B. Please complete the table on P. 3 according to the following steps:

1. Complete the **criterion weights** column. The figures should reflect the relative importance of the subject criterion among all 16 criteria. The total should add up to 100.
2. To the **best case** column, assign to each criterion a score between 0 – 10 according to its relative importance having regard to the characteristics of the subject property. For example, you may consider that the importance of the 'land use' (i.e. past, current and future uses) criterion is worth 7 out of 10 in this regard, then put 7 in the appropriate box in the column.

3. Do the same to the **likely case** and the **worst case** columns.

Notes:

1. Please refer to the background information sheet for meaning of the various criteria.
2. The score for each criterion may not necessary have different value. However, if you assign all the criteria with the same value, or that the columns have identical figures, the proposed model cannot provide an answer.

3. Not all criteria are applicable in your case. You may omit those inappropriate ones.

Multi-criteria Decision Making Scoring Table

Criterion	Best case	Likely case	Worst case	Criterion weights
Land uses				
Health risks				
Contamination				
Remediation				
Legal liabilities				
Publicity / reputation of site				
Market conditions				
Physical characteristics of site				
Time factor				
Government regulation				
Listing/ranking on register				
Guarantee from vendor				
Ownership				
Community feeling / perceived risk				
Mortgageability				
Purpose of valuation				
				Total = 100

Thank you for your time and support!!

I will take care of the subsequent calculations using the model.

Example

A particular contaminated property has stigma concern. From experience, the valuer has estimated the stigma value reduction percentage rates as follows:

A. Best case: 5% B. Likely case: 7% C: Worst case: 10%

Having regarding to the relevant factors, he has made the following entries in the multi-criteria decision making scoring table:

Multi-criteria Decision Making Scoring Table

Criterion	Best case	Likely case	Worst case	Criterion weights
Land uses	6	7	9	9
Health risks	6	8	9	12
Contamination	7	7	8	10
Remediation	7	7	8	8
Legal liabilities	6	7	7.5	7
Publicity / reputation of site	6	6.5	7	3
Market conditions	8	7.5	6	3
Physical characteristics of site	8	8	7	10
Time factor	5	6	6.5	6
Government regulation	4	4	5	5
Listing/ranking on register	1	2	3	7
Guarantee from vendor	1	1	2	2
Ownership	4	4	4	1
Community feeling / perceived risk	4	4.5	5	4
Mortgageability	6	6	6	10
Purpose of valuation	3	3	3	3
				Total = 100

Note: This is a hypothetical scenario for demonstration purposes. The figures presented here should not affect the decision in your case.

Reminder Letter

15 November, 1999

«Title» «FirstName» «LastName»
«Company»
«Address1»
«City», «State» «PostalCode»

Dear «FirstName»,

Re: Contaminated Land Research Survey

How are you? I sent you a copy of contaminated land research survey document on 25 October 1999. So far I have not received your reply. I know you are a busy person but I still hope that you can spend some time to complete the survey document and return it to me. Without your help, I cannot finish the research.

If you have problem with completing the document, please do not hesitate to ring me on 02 9852 4212. If you like, you may fax the completed document to me on 02 9852 4185.

I am looking forward to receiving you reply. Thank you for your time and help.

Yours sincerely,

Nelson Chan
Valuation Lecturer
Faculty of Management

Appendix VI

Chan N. 1996, *Land Contamination And Land Value*
Paper presented at the 2nd Pacific Rim Real Estate
Society Conference at Sanctuary Cove, Gold Coast,
Queensland, 21 – 24 January.

Publication

Due to copyright laws, the following paper has been omitted from this thesis.

Chan, Nelson (1996). Land contamination and land value, In *Pacific Rim Real Estate Society (P.R.R.E.S.) conference papers*, Gatton, Qld.: Pacific Rim Real Estate Society.

Appendix VII

Chan N. 1997

Statutory Land Contamination Law in Australia

Paper presented at the

3rd Annual Pacific Rim Real Estate Society Conference

at Massey University, New Zealand

20 – 22 January

Publication

Due to copyright laws, the following paper has been omitted from this thesis.

Chan, Nelson (1997). Statutory land contamination law in Australia, In *The proceedings of the Third Annual Pacific-Rim Real Estate Society Conference*, Australia: Pacific Rim Real Estate Society.

Appendix VIII

Chan N. 1997

Land Contamination Law – An Overseas Experience

The Valuer & Land Economist

34 (7), pp 644 – 648

Publication

Due to copyright laws, the following article has been omitted from this thesis.

Chan, Nelson (1997). Land contamination law - an overseas experience. *The valuer & land economist*, 34(7), 644-648.

Appendix IX

Chan N., Jefferies, R.L. & Simons, R.A. 1998

Government Regulation of Contaminated Land –

A Tale of Three Cities

Environmental And Planning Law Journal,

15(5), pp 321 – 337

Publication

Due to copyright laws, the following article has been omitted from this thesis.

Chan, Nelson, Jefferies, Rodney L., & Simons, Robert A. (1998). Government regulation of contaminated land - a tale of three cities. *Environmental and planning law journal*, 15(5). 321-337.

Appendix X

Chan, N. 1999

The Impact of Environmental Planning

on the Value of Contaminated Land

Australian Land Economics Review

5(1), pp 8 – 20

Publication

Due to copyright laws, the following article has been omitted from this thesis.

Chan, Nelson (1999). The impact of environmental planning on the value of contaminated land. *Australian land economics review*, 5(1), 8-20.

Appendix XI

Chan N. 2000

Assessment of Contaminated Land Stigma Impact

Paper presented at the

5th Asian Real Estate Society Annual Conference

in Beijing

26 – 30 July

Publication

Due to copyright laws, the following paper has been omitted from this thesis.

Chan, Nelson (2000). Assessment of contaminated land stigma impact, In *Proceedings of the 5th Asian Real Estate Society annual conference*, Beijing: Asian Real Estate Society.

Appendix XII

Chan, N. 2000

How Australian Appraisers Assess Contaminated Land

The Appraisal Journal

LXVIII(4), pp. 432 – 440

Publication

Due to copyright laws, the following article has been omitted from this thesis.

Chan, Nelson (2000). How Australian appraisers assess contaminated land. *The appraisal journal*, LXVIII(4), 432-440.

Chan, N. 2000

Turning Contaminated Land into A Valuable Asset

Australian Property Journal,

36(4), pp. 301 – 307

Publication

Due to copyright laws, the following article has been omitted from this thesis.

Chan, Nelson (2000). Turning contaminated land into a valuable asset. *Australian property journal*, 36(4), 301-307.

Bibiography

Abelson P. 1996, *Project Appraisal and Valuation of the Environment*, Macmillan Press Ltd.

Alexander A.A. & Muhlebach R.F. 1990, *Managing And Leasing Commercial Properties*, Wiley.

Andreen W.L. 1992, The Evolving Law of Environmental Protection in the United States: 1970 – 1991. *Environmental and Planning Law Journal*, 9 (2), pp.96 – 109.

Annand P.G. 1993, Remediation, Development and Marketing, *The Valuer And Land Economist*, 32(8), pp. 598 – 600.

Appraisal Institute 1994, *Guide Note 8 The Consideration of Hazardous Substances In The Appraisal Process.*

Appraisal Institute 1996, *The Appraisal Of Real Estate*, 11th edition.

Argyrous G. 1996, *Statistics for Social Research*, Macmillan Education Australia Pty Ltd.

Arnold C. 1992, The Queensland Local Government (Planning and Environment) Act 1990 and the Solicitor – Practice Problems, *Environmental and Planning Law Journal*, 9(3), pp.195 – 205.

Asahi T., Turo D. & Shneiderman B. 1995, *Visual decision-making: Using treemaps for the Analytic Hierarchy Process*, http://www.acm.org/sigchi/chi95/Electronic/documents/Videos /ta-bdy.htm, 18 May 2000.

Australian and New Zealand Environment and Conservation Council (ANZECC) 1993, *Financial Liability For Contaminated Site Remediation, A Discussion Paper.*

Australian and New Zealand Environment and Conservation Council (ANZECC) 1994, *Financial Liability For Contaminated Site Remediation, A Position Paper.*

Australian and New Zealand Environment and Conservation Council (ANZECC) 1997, *Guide To Environmental Legislation In Australia And New Zealand.*

Australian and New Zealand Environment and Conservation Council, National Health and Medical Research Council (ANZECC & NHMRC) 1992, *Australian And New Zealand Guidelines For The Assessment And Management Of Contaminated Sites.*

Australian Bureau of Statistics (ABS) 2000, *Australia Now – A Statistical Profile: Population – Population distribution*, http://www.abs.gov.au, 25 March.

Australian Bureau of Statistics 1992, *Australia's Environment -- Issues And Facts.*

Australian Institute of Valuers and Land Economists (AIVLE) 1994, Contaminated Land Practice Standard.

Australian Institute of Valuers and Land Economists (AIVLE) 1997, *Valuation Principles And Practice*, Chapter 22.

Australian National Audit Office (ANAO) 1996, Environmental Management of Commonwealth Land Site Contamination and Pollution Prevention.

Australian Property Institute (API) 1999, *Guide Note 15,* Professional Practice 2000, pp.183 – 205.

Australian Property Institute (API), 2000, Corporate Environmental Reporting and National Environment Protection Measure, *Technical Paper*, Vol. 5, No. 1, p. 2.

Baird M. 1992, Coode Island And Contaminated Sites, *Australian Planner*. 30 (4), pp.215-220.

Balchin P.N., Kieve J.L. & Bull G.H. 1988, *Urban Land Economics and Public Policy*, London: Macmillan Education Ltd.

Ball J. & Srinivasan V.C. 1994, Using the Analytic Hierarchy Process in House selection, *Journal of Real Estate Finance and Economics*, 9, pp. 69 – 85.

Barnes R. 1992, Independent Auditing Of Building Environments: A Management Responsibility, Property *Management*, 10(2), pp. 224 – 230.

Barrell J. 1996, Contaminated Land, new laws, new liabilities, *The Safety & Health Practitioner*, January, pp. 17 – 18.

Barret H. 1995, Environment Bill -- New Control, *Estate Gazette*. p.147.

Bates G.M. 1992, *Environmental Law In Australia*, Butterworths. 3rd edition.

Bates G.M. 1995, *Environmental Law In Australia*, Butterworths. 4th edition.

Baum A. & Crobsy N. 1989, *Property Investment Appraisal*, Routledge London.

Baum A. & MacGregor B. 1992, The initial yield revealed: explicit valuation and the future of property investment, *Journal of Property Valuation and Investment,* 10: pp. 709 – 726.

Baumol W.J., Blinder A.S., Gunther A.W. and Hicks J.R.L. 1992, *Economics Principles and Policy* 2nd Australian Edition, Australia: Harcourt Brace Jovanovich, Publishers.

Beder S. 1993, *The Nature of Sustainable Development*, Australia: Scribe Publications.

Bell R. 1999, *Real Estate Damages*, Appraisal Institute, Case Study 16.

Bender A., Din A., Favarger P., Hoesli M. & Laakso J. 1997, An Analysis of Perceptions Concerning the Environmental Quality of Housing in Geneva, *Urban Studies*, 34(3), 503 – 513.

Bender A., Din A., Hoesli M. & Laakso J. 1999, Environmental quality perceptions of urban commercial real estate, *Journal of Property Investment & Finance*, 17(3), 280 – 296.

Berveling S.M. 1994, *Contaminated Sites: Some Issues*, Berveling & Co.

Bindon J. 1992, Transferable Development Rights, *Australian Planner*, September, pp. 136 – 141.

Boer B., Fowler R. & Gunningham N. (Ed.) 1994, *Environmental Outlook Law and Policy*, Federal Press.

BOMA NSW 1996, Tougher Environmental Law on Way, Issue No. 83, p. 3.

BOMA International 2001, *Superfund*, http://www.boma.org/suprissu.htm, 17 May 2001.

Bond S.G. 1998, *The Appraisal of Contaminated Land in New Zealand*, research paper presented at the 14th American Real Estate Society Conference in conjunction with the International Real Estate Society Meeting, Monterey, California, 15 – 18 April.

Bond S. G. 2000, *Do Market Perceptions Affect Market Prices? A case study of a remediated contaminated site*, research paper presented at the 16th American Real Estate Society Conference, Santa Barbara, California, 29 March – 1 April.

Bounds M. 1993, Property Values And Popular Politics, *Australian Planner*, March, pp. 14 – 18.

Bouyssou D., Perny P., Tsoukias A. & Vincke P. 1993, A manifesto for the new MCDA era, *Journal of Multi-criteria Decision Analysis*, 2, pp.125 – 128, cited in Buchanan and Henig 1997.

Braul W. 1990, Toxic Real Estate in British Columbia: Liability, *West Coast Environmental Law Research Foundation Vancouver, Canada*, http://freenet.vancouver.bc.ca/local.pages /wcelpub/5170.html, 9 September 1996.

Brotherton P. 1990, Intractable Waste: The problem that won't go away, *Habitat Australia*, Winter, pp. 16 – 19.

Brown G., Matysiak G. & Shepherd M. 1996, *Valuation Uncertainty and the Mallinson Report*, Paper at the RICS Cutting Edge Conference, Bristol, September.

Buchanan J.T. and Henig E.J. 1997, *Objectivity and Subjectivity in the Decision Making Process*, http://www.mngt.waikato.ac.nz/depts/mnss/john/sobobj1.htm, 29 February 2000.

Burton J.H. 1982, *Evolution of the Income Approach*, American Institute of Real Estate Appraisers.

Buttle F.A. & Jayne M.R. 1999, ISO9000: is the real estate sector any different?, *Property Management*, 17 (2) , pp. 125-138.

Byrne P. 1996, *Risk, Uncertainty and Decision-making in Property Development*, 2nd edition, E & FN Spon, London.

Byrns, R.T. & Stone, G.W., 1992, *Economics*, Harper Collins Publishers, pp. 401 – 402.

Cadman D. 1994, Shiftig values, *Estate Gazette*, 5 November, 144EG232.

Cameron M.D.R. and Dowse J. 1990, Contaminated sites: vendor and purchaser, *Law Institute Journal*, 64 (5), pp. 404 – 406.

Capozza D.R. & Sick G.A. 1991, Valuing Long Term Leases: The Option to Redevelop, *Journal of Real Estate Finance and Economics*, 4 (2), pp.209 – 223.

Carbon B. 1996, Enhancing basic environment protection, *Waste Management & Environment Source Book*. pp. 8 – 10.

Cardew R. 1999, Two Cultures, Common Purpose, *Australian Planner*, 36 (3), pp.134 – 141.

Carson R., Wilks L. & Imber D. 1994, Valuing The Preservation Of Australia's Kakadu Conservation Zone, *Oxford Economic Papers*, 46(1994), pp. 727 – 749.

CCH Australia Limited 1999, *Australian Master Tax Guide*, Chapter 20, Sections 20-750 – 20-765.

Chalmers J.A. & Jackson T.O. 1996, Risk Factors in the Appraisal of Contaminated Property, *The Appraisal Journal*, LXIV (1), pp. 44 – 58.

Chalmers J.A. & Roehr S.A. 1993, Issues in the Valuation of Contaminated Property, *The Appraisal Journal*, LXI (1), pp.28 – 41.

Chan N. 1996, *Land Contamination And Land Value*, paper presented at the 2nd Pacific Rim Real Estate Society Annual Conference, Sanctuary Cove, Gold Coast, Queensland, Australia, 21 – 24 January.

Chan N. 1997a, *Statutory Land Contamination Law in Australia*, paper presented at the 3rd Pacific Rim Real Estate Society Annual Conference, Massey University, New Zealand, 20 – 22 January.

Chan N. 1997b, Land Contaminated Law – The Overseas Experience, *The Valuer & Land Economist*, 34 (7), pp. 644 – 648.

Chan N., Jefferies R.L. & Simons R.A. 1998, Government Regulation of Contamination Land – A Tale Of Three Cities, *Environmental And Planning Law Journal*, 15 (5), pp.321-337.

Chan N. 1999a, The Impact of Environmental Planning on the Value of Contaminated Land, *Australian Land Economic Review*, 5(1), pp. 8 – 20.

Chan N. 1999b, *Identification and Management of Contaminated Land*, refereed paper presented at the International Real Estate Society Conference' 99, Kuala Lumpur, Malaysia, 26 – 30 January.

Chan N. 2000a, *Assessment of Contaminated Land Stigma Impact*, paper presented at the 5th Asian Real Estate Society Annual Conference, Beijing, China, 26 – 30 July.

Chan N. 2000b, How Australian Appraisers Assess Contaminated Land, *The Appraisal Journal*, LXVIII(4), pp. 432 – 440.

Chan, N. 2000c, Turning Contaminated Land into A Valuable Asset, *Australian Property Journal*, 36(4), pp. 301 – 307.

Chartered Surveyor Monthly 1996, *Contaminated Land*, Supplement April.

Clarke G.D., Director of McGees National Property Consultants, (interview, August 1998).

Clarke H.W. 1996, Contaminated Land – New Statutory Framework for Dealing with a Difficult Problem, *Land Contamination & Reclamation*, 4(1), pp. 47 – 48.

Cochrane A. 1998, Industry Service, Vic EPA, Interview, August.

Colangelo, R.V. & Miller, R.D. 1995, *Environmental Site Assessments and Their Impact on Property Value: The Appraiser's Role*, Appraisal Institute.

Cole C. 1996, Organochlorines: the New Zealand clean-up program, *Waste Management & Environment Source Book*, pp. 49 – 50.

Cole R., Guilkey D. & Miles M. 1986, Towards An Assessment of the Reliability of Commercial Appraisal, *The Appraisal Journal*, LIV(3), pp. 422 – 432.

Collan, S.J. & Thomas, J.M. 1996, *Environmental Economics And Management*, Erwin.

Compton's Interactive Encyclopedia, 1994.

Consortium for International Earth Science Information Network (CIESIN), 2001, *Which Treaties Are In Force For A Given State?* http://sedac.ciesin.org/prod/charlotte, 17 May 2001.

Covello V.T. & Mumpower J. 1985, Risk Analysis and Risk Management: A Historical Perspective, *Risk Analysis*, 5(2), pp. 103 –120.

Crosby N., French N. & Ward C.W.R. 1994, *Valuation Accuracy – A Self Fulfilling Prophecy?* Paper at the RICS Cutting Edge Conference, London.

Crosby N., Lavers A. & Murdoch J. 1998, *Property Valuation Variation And The "Margin Of Error"*, Paper presented at the 4th Pacific Rim Real Estate Society Conference, Perth, 19 – 21 January.

CSIRO-CRC 1996, *Proposed Contaminated Site Tax*, http://www.crcslm.waite.adelaide.edu.au/Press/200296.txt, 24 August 1999.

Cummings R.G., Brookshire D.S. & Schulze W.D. 1986, *Valuing Environmental Goods: An assessment of the Contingent Valuation Method*, Rowman and Allenheld, New Jersey.

Darby, A. 2000, *Uranium Mining in Australian National Park Challenged*, Environment News Service, http://ens.lycos.com/ens/nov2000/2000L-11-27-01.html, 18 May 2001.

Darlow A. & Carter N. 1995, Greening the development industry, *Estate Gazette*, Issue 9547, pp. 140 – 141.

Davis F. & Wills P. 1997, *Real Property Management*, 4th edition, Petfran Publications.

Delafons J. 1991, Planning in the USA – A Better System? *The Planner*, February, pp. 7 – 8.

Delafons J. 1991, Planning in the USA – Paying for Development, *The Planner*, June, pp. 8 – 9.

Denton T. 1993, Market Definition Set In Melbourne, *Australian Property News*, 21 March p.4.

Department of Environment (Qld) 1996, *Contaminated land in Queensland*, Environment Information.

Department of Environment (Qld) 1996, *Contaminated sites: registration and classification*, Environment Information.

Department of Environment, Queensland Government (QLD DoE) 1998, *Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland.*

Department of Planning (NSW) 1994, *EIS Report: Review of Amendments to Schedule 3 of the Environmental Planning and Assessment Regulation 1980.*

Department of Planning and Housing (Vic) 1992, *Direction No. 1: Potentially Contaminated Land.* Explanatory Statement.

Department of Planning and Housing (Vic) 1992, *Minister's Direction: Potentially Contaminated Land.*

Department of Urban Affairs and Planning (NSW) 1995a, *Planning Guidelines for Contaminated Land.*

Department of Urban Affairs and Planning (NSW) 1995b, *State Environmental Planning Policy No 48 – Major Putrescible Landfill Sites*, Circular No. B38.

Department of Urban Affairs and Planning (NSW) 1996, *Planning Guidelines For Contaminated Land*, Circular No. E9.

Department of Urban Affairs and Planning (NSW) 1997, *Multi-level Risk Assessment.*

Dixon T. & Richards T. 1995, Valuation lessons from America, *Estate Gazette*, Issue 9529, pp.110 –112.

Dixon T. 1996, Contaminated Land: a changing landscape, *Estate Gazette*, Issue 9608, pp.136 – 138.

Department of Urban Affairs and Planning & the NSW Environment Protection Authority (DUAP & NSW EPA) 1998, *Managing Land Contamination: Planning Guidelines SEPP 55-Remediation of Land.*

Diaz J. 1997, An Investigation into the Impact of Previous Expert Value Estimates on Appraisal Judgment, *Journal of Real Estate Research*, 13(1),pp. 57 – 66.

Dober M. 1996, Waste Treatment Coordinator, Environmental Protection Branch, Environment Canada, Atlantics Region, doberm@cpdar.am.doe.ca, reply to author's e-mail enquiry, 15 July.

Dotzour M. 1997, Groundwater Contamination and Residential Property Values, *The Appraisal Journal*, LXV (3), pp.279 - 285.

Doyle D. 1995, Out Of Site, Out Of Mind, *New Planner*, March – April, pp. 16 – 17.

DPIE 1998, *Maralinga – Our Own Shame*, The Maralinga Rehabilitation Projects, http://www.sea-usorg.au/thunder/britsbombingsus.html, 25 March 2000.

Duncan W.D. 1993, *Planning and Environmental Law in Queensland*, The Federation Press.

Dybvig L. O. 1992, *Contaminated Real Estate Implications for real estate appraisers*, The Research And Development Fund, Appraisal Institute Of Canada (AIC).

Dybvig L., Malick J. & King C. 1996, Purchasing Contaminated Sites Emerging, *The Canadian Appraiser*, Spring, pp. 26 – 30.

Egerton L. 1990, *Do It Yourself Earth Repair An Australian Guide Towards Better Planet Habits*, Australia: Reed Books Pty Ltd.

Environment Australia 1999, *An overview of the Environment Protection and Biodiversity Conservation Act.*

Environmental Defender's Office NSW 1992, *Environment And The Law*, CCH Australia Limited.

Environmental law & Management 1995, 7 (5), p.166.

Estate Gazette 1996, Clarifying contamination, Issue 9630, pp. 90 – 91.

Fisher A.C. 1981, *Resource and environmental economics*, Cambridge: Cambridge University Press.

Fisher D.E. 1995, The Environmental Protection (Interim) Regulation 1995 (Qld), *Environmental and Planning Law Journal*, 12(3), pp. 163 – 167.

Fisher D.E. 1997, Legal Pitfalls for Environmental Consultants, *Environmental and Planning Law Journal*, 14(4), pp. 282 – 294.

Fisher J.D., Lentz G.H. & Tse K.S.M. 1992, Valuation of Commercial Properties Contaminated With Asbestos, *Journal of Real Estate Research*, 7, pp.331 – 350.

Fleming J. G. 1987, *Law Of Torts*. The Law Book Company Limited. 7th ed.

Fleming W.M. 1981, *Phewa Tal Catchment Management Program: Benefits and Cost of Forestry and Soil Conservation in Nepal*, Unpublished Case Study. Honolulu: East-West Environment and Policy Institute, cited in NSW EPA, 1993.

Fowler R.J. 1996, Environmental Impact Assessment: What Role for the Commonwealth? -- An Overview, *Environmental and Planning Law Journal*, 13 (4), pp.246-259.

Freudenburg W.R. 1988, Perceived Risk, Real Risk: Social Science And The Art Of Probabilistic Risk Assessment, *Science*, 242, pp.44 – 49.

Friedman J.P. & Ordway N. 1981, *Income Property Appraisal and Analysis*, Reston Publishing Company, Inc.

Fulford C. 1996, Making withdrawals from the landbank, *Estate Gazette*, Issue 9638, pp. 132 – 134.

Gain K.J. 1990, Appraising by Probability Analysis, *The Appraisal Journal*, LVIII (1), pp.119 – 126.

Gallimore P. 1996, Confirmation bias in the valuation process: a test for corroborating evidence, *Journal of Property Research*, 13(4), pp. 261 – 273.

Gallimore P. & Wolverton M. 1998, Price-knowledge-induced bias: a cross-cultural comparison, *Journal of Property Valuation And Investment*, 15(3), pp. 261 – 273.

Gallimore P. & Jayne M.R. 1999, Public and professional principles of HVOTL risks, the problem of circularity, *Journal of Property Research*, 16(3), pp. 243 – 255.

Garrod G. & Willis K.G. 1999, *Economic Valuation of the Environment*, Edward Elgar.

Geltner D.M., Groff R.A. & Young M.S. 1995, Random Disaggregate Appraisal Error in Commercial Property: Evidence from the Russel-NCREIF Database, *The Journal of Real Estate Research*, 3(1), p. 403 – 419.

Geltner D. 1997, Bias and Precision of Estimates of Housing Investment Risk Based on Repeat-Sales Indices: A Simulation Analysis, *Journal of Real Estate Finance and Economics*, 14(1/2), pp. 155 – 177.

Giersch H. (Ed.) 1993, *Economic Progress and Environmental Concerns*, New York: Springer-Verlag.

Gifford D.J. & Gifford K.H. 1987, *Town Planning Law & Practice*, Law Book Company, Chapter 1.

Goddard J. 2000, Managing Industrial Property in an Environmental Minefield, *Australian Property Journal*, 36(2), pp. 100 – 103.

Golden B.L., Wasil E.A & Levy D.E. 1989, Application of the analytic hierarchy process: a categorized, annotated bibliography in: Golden B.L., Wasil E.A. & Harker P.T. (eds) 1989, *The Analytic Hierarchy Process, Applications and Studies*, Berlin: Springer-Verlag, pp. 37 – 58, cited in Bender et al (1997).

Graziano A.M. & Raulin M.L. 1989, *Research Methods A Process of Inquiry*, Harper Collins Publishers.

Greenberg M. & Huges J. 1993, Impact of Hazardous Wastes Sites on Property Value and Land Use: Tax Assessors' Appraisal, *The Appraisal Journal*, LXI, (1), pp.42 – 51.

Greenpeace Australia, 1997a, *A Greenpeace investigation of Dioxin Contamination in and around Homebush Bay, site of the Sydney 2000 Summer Olympics*, http://www.sofcom.com.au/Greenpeace/dioxinReport.html, 1 August 1997.

Greenpeace Australia, 1997b, *Greenpeace Investigation Shows World Class Contamination Next To Sydney 2000 Olympics*, http://www.sofcom.com.au/Greenpeace/mediaRelease.html, 1 August 1997.

Greenpeace Australia, 1997c, *Greenpeace Olympic Reports*. http://www.greenpeace.org.au/ Olympics/27.122.html, 5 March 1998.

Greenpeace Australia, 1997d, *Toxic Trade Reports*. http://www.greenpeace.org.au/Toxics /49.137.html, 5 March 1998.

Gronow S. 1998, Contaminated land – the inevitability of an explicit appraisal model, *Property Management*, 16 (1), pp.24 – 32.

Gronow S. 1999, Contaminated land – quantifying the inputs to an explicit appraisal model, *Property Management*, 17 (2), pp.169 – 185.

Gronow S. 2000, Contaminated Land – education and training for an explicit appraisal model, *Property Management*, 18(5), pp. 324 – 334.

Gunningham N. 1993, Environmental Auditing: Who Audits the Auditors? *Environmental and Planning Law Journal* (EPLJ), 10 (4), pp.229 – 238.

Guntermann K.L. 1995, *Sanitary Landfills, Stigma and Industrial Land Values*, The Journal of Real Estate Research, 10 (5), pp.531 – 542.

Hadley M. 1994, Environmental audits as a tool for commercial property management, *Property Management*, 10 (2), pp.141 – 149.

Hamilton S.W. & Schwann G.M. 1995, Do High Voltage Electric Transmission Lines Affect Property Value? *Land Economics*, November, cited in Kinnard & Worzala 1996.

Hanley N. and Spash C.L. 1993, *Cost-Benefit Analysis and the Environment*, England: Edward Elgar Publishing Ltd.

Harvey J. 1987, *Urban Land Economics: The Economics of Real Property*, 2nd edition, Basingstoke: Macmillan Education

Harvey N. 1994, Timing Of Environmental Impact Assessment, *Australian Planner*, 31 (3), pp. 125 – 130.

Henig M. & Buchanan J. 1996, *Decision Making by Multiple Criteria: A Concept of Solution*, http://www.mngt.waikato.ac.nz/depts/mnss/john/procon.htm, 29 February 2000.

Hirschhorn J.S. 1990, Cleaning Up: The Second Decade, *Civil Engineering*, 60(10), pp. 66 – 68.

Ho D. 1999, Preferences on Office Quality Attributes: A Sydney CBD Study, *Australian Land Economics Review*, 5(2), pp. 36 – 42.

Hocking R. 1997, The Valuation of landfill sites, *New Zealand Valuers' Journal*, March, pp. 33 – 41.

Hoffman J.J., Schniederjans M.J. & Sirmans G.S. 1990, A Multi-Criteria Model for Corporate Property Evaluation, *The Journal Of Real Estate Research*, 5(3), pp. 285 – 300.

Hogarth M. 1997a, $21m clean-up for toxic bay at Games site, *Sydney Morning Herald*, Wednesday 20 June.

Hogarth M. 1997b, Dioxin down under, *Sydney Morning Herald*, Friday 4 July.

Hogarth M. 1997c, Research backs concern on toxin, *Sydney Morning Herald*, Thursday 3 July.

Hollick M. 1986, Environmental Impact Assessment: An International Evaluation, *Environmental Management*, 10 (2), pp.157 - 178.

Holmes R. & Broughton M. 1995, Insurance cover for damage to the environment, *Estate Gazette*, Issue 9513, pp. 123 – 125.

Homel, B. 1999, Just a Process Change? The Impact of IDAS on Environmental Protection in Queensland, *Environmental and Planning Law Journal*, 16 (1), pp 75-91.

Hufschmidt M., James D., Meister A., Bower B., and Dixon J. 1983, *Environment, Natural 0Systems, and Development, An Economic Valuation Guide*, London. (Cited in NSW EPA, 1993).

Humphries D. 1995, *Inquiry into Sydney Sprawl*, The Sydney Morning Herald, May 24, p.1

Hunt T. 1992, *Environmental Liability Recognising The Risks*, Paper presented at the Australian Institute Of Valuers And Land Economists 28th Kiparra Day, 14 August.

Hutchison N. 1996, How much do valuers vary in their valuations of commercial property? *RICS Research Findings No.2*, London, Royal Institution of Chartered Surveyors.

Hyam. A. A. 1995, *The Law Affecting Valuation Of Land In Australia*, The Law Book Company Limited.

Imber, D.G.S. & Wilks, L. 1991, A contingent valuation survey of the Kakadu conservation zone, *RAC Research Paper, No. 3*, Canberra.

InfoHarvest Inc. 1996, *Criterium DecisionPlus Trialware User's Guide and Tutorial.*

Infoplease 1999, *Miscellaneous Disasters*, http://www.infoplease.com/ipa/A0001455.html, 14 December 1999.

Information and Discussion Forum on Priority Setting in Agricultural Research (ISNAR) 1998, *Measurement Methods - The Analytic Hierarchy Process*, http://www.cgiar.org/ ISNAR/Fora/ Priority/MeAnalit.htm, 17 June 1998.

Izmir G. 1996, Clean and Competitive with ISO 14000, *WM&E Sourcebook, Waste Management & Environment*, pp. 22-26.

Jackson J., McIver R. and McConnel C. 1994, *Micro Economics*, 4th edition, Australia: McGraw-Hill.

Jackson T.O. 1987, Investing in Contaminated Real Estate, *Real Estate Review*, 27(4), pp. 38 – 43.

Jayne, M.R. 1994, Are chartered surveyors able to give environmental advice? *Chartered Surveyor Monthly*, 3(4), p. 13.

Johnsen H. 1992, The Adequacy of the Current Response to the problem of Contaminated Sites. *Environmental and Planning Law Journal*, 9 (4), pp.230 - 246.

Kansai International Airport Co. Ltd. (KIA) 1997, *Kansai International Airport History*, http://www.kiac.co.jp/english/history/history.htm, 14 December1999.

Lealy M.J., Dovids J.F. & Rockel M.L. 1988, Accuracy in Valuation is a Matter of Degree, *Land Economics*, 64(2), pp. 158 – 171.

Kelly, W. & Mitchell, P. 1995, A Requiem for Ellwood, The Appraisal Journal, LXIII(3) , pp. 284 – 290.

Kennedy, P.J. 1997, *Investment valuation of contaminated land and UK practice: a study with special reference to former gasworks*, unpublished PhD thesis, The Nottingham Trent University, Nottingham (cited in cited Kinnard et al 1999).

Kepner C.H. & Tregoe B.B. 1981, *The New Rational Manager*, John Martin, (cited in Multi-criteria Decision Making, http://carlisle.unn.ac.uk/students/bm304/mcdm.htm, 20 June 1999).

Kiel, K. & Zabel J. 1998, *The Economic Benefit of Cleaning Superfund Sites*, paper represented at the annual meeting of the American Real Estate Society in Monterey, California, April.

Kinnard W.N., Mitchell P.S. & Webb J.R. 1989, *The Impact of High-voltage Overhead Transmission Lines on the Value of Real Property*, Paper presented at the American real Estate Society Annual Conference, Arlington, VA, April.

Kinnard W.N. 1992, *Measuring The Effect Of Contamination On Property Values: The Focus Of The Symposium In The Context Of Current Knowledge, Technical Report: Measuring the Effects of Hazardous Materials Contamination on Real Estate Values: Techniques and Applications*, Appraisal Institute, pp.1 – 22.

Kinnard W.N. & Worzala E. 1996, Attitudes And Policies Of Institutional Investors And Lenders Toward On-site And Nearby Property Contamination, paper presented at the 12th annual meeting of the American Real Estate Society at South Lake Tahoe, California, 29 March.

Kinnard W.N., Worzala E.M., Bond S. & Kennedy P. 1999, *Comparative Studies of United States, United Kingdom and New Zealand Appraisal Practice: Valuing Contaminated Property.* Research paper presented at the 15th American Real Estate Society Annual Meeting in Tampa, Florida, 7 – 10 April.

Kinnard W.N. & Dickey S.A. 2000, *High Voltage Transmission Lines and Residential Property Values: New Findings About Unobstructed Views And Town Construction*, Paper presented at 16th Annual Meeting, American Real Estate Society, Santa Barbara, California, 31 March.

Klaassen C. D. 1995, *Casarett & Doull's Toxicology The Basic Science Of Poisons*, 5th edition, McGraw-Hill.

Kneese A.V. 1977, *Economics And The Environment.* England: Penguin Education.

Kohlhase J. 1991, The Impact of Toxic Waste Sites on Housing Values, *Journal of Urban Economics*, 30, (1).

Kulakowski K., Robinson, D. Pain N., Fraser S.A. & Richards M. 1992, *Environmental Responsibility Law – New South Wales*, The Law Book Company Limited.

Kyle R.C., & Baird F.M. 1995, *Property Management*, 5th Edition, Real Estate Education Company, pp.379-381.

Lally P. 1998, The Role of Valuers in an Environmentally Sensitive Future, *The Valuer & Land Economist*, 35 (1), pp. 12 - 18.

Lang A. c. 1994, *Land Contamination*, CLE Updates.

Lawsearch Online, http://www.lawsearch.gov.au/SubResults2.asp, 17 May 2001.

Lawson M. 1995, "Tougher laws are starting to bite", *Financial Review*, Special Report, 31 August, p.33

Lee R. 1994, Cambridge Water v. Eastern Counties Leather: The Polluter's Charter? *Property Management*, 12(3), pp. 29 – 32.

Lee R. 1996, Should the valuer be the insurer of all the client's risk? *Property Management*, 14(2), pp. 19 – 28.

Lee R. 1997, Valuers do not need a crystal ball, *Property Management*, 15(1), 25 – 31.

Lee R.G. 1993, The Obligation of Lenders To Remediate Contaminated Land -- A Comparative Analysis. *Environmental And Planning Law Journal*, 10 (2) , pp.97 - 114.

Leeson, R. 1994, EIA and the Politics of Avoidance, *Environmental and Planning Law Journal*, 11 (1), pp.71-92.

Lentz G.H. & Tse K.S.M. 1995, An Option Pricing Approach to the Valuation of Real Estate contaminated with Hazardous Materials, *Journal of Real Estate Finance and Economic*, 10 (2), pp.121 – 144.

Lewis R. 1995, Contaminated Land: The New Regime of the Environment Act 1995, *Journal of Planning & Environment Law*, 12 (6) p.1087.

Liang, N. 1992, Putting a Price on the Problem – Valuation Issues, Conference paper, Drivers Jonas, London, (cited in Syms 1997b).

Ling L. and Isaac D. 1996, Environmental management issues in China: problems and strategies, *Property Management*, 14(3), pp. 17 –26.

Lipman Z. 1991, Criminal Liability under the Amended Environmental Offences and Penalties Act 1989 (NSW), *Environmental and Planning Law Journal*, 8(4), pp.322 – 337.

Lipman Z. 1992, Institutional Reform: The New South Wales Environment Protection Authority, *Environmental and Planning Law Journal*, 9(6), pp. 445 – 457.

Lipman Z. & Roots L. 1995, Protecting The Environment Through Criminal Sanctions: The Environmental Offences And Penalties Act 1989 (NSW). *Environmental And Planning Law Journal*, 12 (1), p.16 – 37.

Love E. 1996, The changing face of waste management, *Waste Management & Environment Source Book*, pp. 20 – 21.

Lucey T. 1988, *Quantitative Techniques – An Instructional Manual*, ELBS.

MacKay R. 1998, National Acquisition and Leasing Manager, Heine Property Management Limited, interview, 11 August.

MacKay R. 2000, Property Manager, Mercantile Mutual, telephone interview, 18 May.

Mannion A.M. 1991, *Global Environmental Change*, UK: Longman Scientific and Technical.

Mant B. 1991, Quantified Risk Assessment, *Australian Planner*, 29(4), pp. 202 – 203.

Mant J. 1992, *Environmental Law -- An Australian Perspective*. Paper for short course on Environmental Regulations, Compliance and Liability held at the University of New South Wales, 6 and 7February.

Maslen P.G. 1994, Site Remediation Case Study, Ampol Refinery Site, Matraville, *Environmental Issues*, Australian Institute of Valuers and Land Economists.

Matern C. W. 1996, Chris Matern Consulting, USA, cmatern@aol.com, reply to author's e-mail enquiry, 21 July.

McDonal J. 1994, Financial Liability for Contaminated Site Clean-ups – The increasingly strict standard of fault-based liability, *Environmental and Planning Law Journal*, 11(6), pp.516 – 522.

McFarland R. 2000, *Practical Experience in NSW Contaminated Site Auditing*, CH2M Hill Australia.

McIntyre, O. 1996, The Environmental Act 1995 – an Outline of the Contaminated Land Provisions, *Journal of Property Development*, 1(1), pp. 5 – 9.

McLean D.G. & Mundy B. 1998, The Addition of Contingent Valuation and Conjoint Analysis to The Required Body of Knowledge for the Estimation of Environmental Damages, *Journal of Real Estate Practice and Education*, 1 (1), pp.1 – 19.

McMahan, J. 1989, Environmental Hazards And Real Estate, *Real Estate Issues*, 14(1), pp.1 – 6.

Messiner S.L., Henshaw J.M., Montgomery J.M. & Holder D c.1997, *Composite Design and Manufacturing Critiquing System*, http://www.isl-garnet.uah.edu/Composites/cdmcs1.htm, 18 May 2000.

Mfodwo K. 1991, Lender Liability for Environmental Impairment and Remediation in New South Wales: Issues Problems and Prospects, *Environmental and Planning Law Journal*, 8(2), pp. 108 – 132.

Microsoft Corporation, 1999, *Environment*, Microsoft Encarta Encyclopedia 2000.

Microsoft Corporation, 1999, *Environmentalism*, Microsoft Encarta Encyclopedia 2000.

Miles M., Cole R. & Guilkey D. 1990, A Different Look at Commercial Real Estate Returns, *AREUEA Journal*, 18(4), pp. 403 – 430.

Miller N. 1992, *A Geographic Information System Based Approach to the Effects of Nuclear Processing Plants on Surrounding Property Values: The Case of the Fernald Settlement Study*, unpublished paper, University of Cincinnati, March 31, cited in Reichert 1996.

Minnery J., Cameron C., Brown J. & Newman P. 1993, Evaluation In Urban Planning, *Australian Planner*, March, pp. 8 – 13.

Minogue K. 1998, 'Locals join battle of the Point', *The Daily Telegraph*, Friday 31 July, p. 21.

Mitchell P. & Brown E. 1991, Local Government: A Social Resource for Environmental Control, *Environmental and Planning Law Journal*, 8(1), pp. 41 – 68.

Mollart, R.G. 1988, Monte Carlo Simulation Using LOTUS 123, *Journal of Property Valuation*, 6 (4), pp.419 – 433.

Moon B. 1992, Special Use Zones, *Australian Planner*, December, pp. 231 –234.

Moseley S.1995, Sydney's New Metropolitan Strategy, *Australian Planner*, 32(3), 130 – 134.

Munchenberg S. 1994, Judicial Review and the Commonwealth Environment Protection (Impact of Proposals) Act 1974, *Environmental and Planning Law Journal*, 11 (4), pp.461 – 478.

Mundy B. 1992a, Stigma and Value, *The Appraisal Journal*, LX (1), pp.7 – 13.

Mundy B. 1992b, The Impact of Hazardous Materials on Property Value, *The Appraisal Journal*, LX (2), pp.155 – 162.

Mundy B. 1992c, The Impact of Hazardous Materials on Property Value: Revisited, *The Appraisal Journal*, LX (4), pp.463 – 471.

Mundy B. 1993, Contamination, Fear, and Industrial Property Transactions, *Professional Report*, Washington, DC: Society of Industrial and Office Realtors, May/June.

Mundy, B. 1995, Environmentally Impaired Property and the SIOR, *SIOR Professional Report*, Spring.

Murchison K.M. 1994, Environmental Law in Australia and the United States: A Comparative Overview – Part I & Part II. *Environmental and Planning Law Journal*, Vol. 11, No. 3, pp 179 – 192, Vol. 11, No.4, pp 254 – 273.

Murdoch S. & Murdoch J. 1997, Contamination counts as physical damage, *Estate Gazette*, Issue 9716, p. 125.

Naiker U. 1992, Sustainable Development And Human Settlements, *Australian Planner*, December, pp. 207 – 230.

Nancarrow R. 1992, Environmental audits – impacts on real estate acquisitions, *The Canadian Appraiser*, Spring, pp. 34 – 37.

Nathans. R.R. 1992, *Environmental Liability - Additional Risks For Valuers*. Address to Australian Institute of Valuers and Land Economists at Kiparra Day Seminar, p. 4

National Capital Planning Authority 1993, *Contaminated Sites: legal and Financial Responsibility, and Planning Solution*. Occasional Paper Series 1, Paper 5.

National Environment Protection Council Committee 1999, *National Environment Protection (Assessment of Contaminated Sites) Measure 1999.*

Nelson A.C., Genereux J. & Genereux M. 1992, House Price Effects of Landfills, *Land Economics*, 68(4), pp. 359 – 365.

Nestel G.K., DelRossi J.E., Ullman A.L., Rajusrkv K. & Fava J.A. 1996, *The Road to ISO 14000*, Irwin Professional Publishing.

Neustein, R.A. 1992, Estimating Value Diminution by the Income Approach, *The Appraisal Journal*, LX (2), pp.283 – 287.

Neustein R.A. & Bell R. 1998, Diminishing Diminution: A Trend in Environmental Stigma, *Environmental Claims Journal*, 11 (1), pp. 47- 59.

New Scientist, 1992, 'Comment: Cash Crisis' 8 August, p.3.

New York State Department of Environmental Conservation (NYSDEC), c. 2000, *Frequently Asked Questions About New York's Inactive Hazardous Waste Disposal Site Remedial Program*, http://www.dec.state.ny.us/website/der/pr7hwa&a.html#q14, 17 May 2001.

Newman J. 1993, Sydney's Future, *Australian Planner*, December, pp. 86 – 91.

NSW EPA 1993, *Valuation of Environmental Impacts.*

NSW EPA 1995a, *Contaminated Agricultural Land.*

NSW EPA 1995b, *Draft Guidelines for Consultants Reporting on Contaminated Sites.*

NSW EPA 1995c, *Contaminated Sites: Guidelines for the Vertical Mixing of Soil on Former Broad Acre Agricultural Land.*

NSW EPA 1995d, *Contaminated Sites: Guidelines for Assessing Service Station Sites.*

NSW EPA 1995e, *Contaminated Sites: Sampling Design Guidelines.*

NSW EPA 1995f, *Assessment of Orchard and Market Garden Contamination, Contaminated Sites Discussion Paper.*

NSW EPA 1996a, *Managing Contaminated Land in New South Wales: Proposals for a New Legislative and Administrative Framework.*

NSW EPA 1996b, *Protection of the Environment Operations Bill 1996 Pubic discussion paper.*
NSW EPA 1996c, *Road transport of dangerous goods: consignor and prime contractor responsibilities*, Environmental Matters Hazardous Materials 5.

NSW EPA 1996d, *Road transport of dangerous goods: vehicle owner and driver responsibilities*, Environmental Matters Hazardous Materials 6.

NSW EPA 1997, *Environmental Guidelines: Assessment, Classification and Management of Non-Liquid Wastes.*

NSW EPA 1998a, *Draft guidelines on significant risk of harm from contaminated land & the duty to report.*

NSW EPA 1998b, *State of Environment Report 1997*, http://www.epa.nsw.gov.au/soe/97/ch2 /14_2htm, 20 November 1999.

NSW EPA 1999, *NSW Environmental Legislation*, http://www.epa.nsw.gov.au/envacts.htm, 12 Feb 1999.

NSW EPA 1999, *Overview of the Protection of the Environment Operation Act 1997 (POEO Act)*, http://www.epa.nsw.gov.au/legal.poeo.htm, 8 April, 1999.

O'Brien G. 1998, Chief Scientific Advisor, Department of Environment, Queensland Interview, July.

OECD 1974, *Economic Implications of Pollution Control A General Assessment.*

OECD 1991, *Environmental Indicators.*

Olsen R.K. 1989, Hazardous Waste Sites, *The Appraisal Journal*, LVII (2), pp.233 – 236.

Palmer S. & Lizieri C. 1995, Valuation and investment strategy, *Estate Gazette*, Issue 9542, pp. 124 – 125.

Pan S. 1996, *A Study of Multi-aim Decision Making for Real Estate Projects*, research paper presented at the 2nd Pacific Rim Real Estate Society Annual Conference, Sanctuary Cove, Gold Coast, Queensland, 21 – 24 January.

Parker R. 1996, 'Managing The Risk Of Land Contamination', *Waste Management & Environment*, pp. 65-66.

Parsa A.R.G. & Farshchi M.A. 1996, Environmental regulations and the real estate industry, *Property Management*, 14(1), 6 – 23.

Patchin P.J. 1988, Valuation of Contaminated Properties, *The Appraisal Journal*, LVI (1), pp.7 – 16.

Patchin P.J. 1991, Contaminated Properties – Stigma Revisited, *The Appraisal Journal*, LIX (2), pp.167 – 172.

Patchin P.J. 1994, Contaminated Properties and the Sales Comparison Approach, *The Appraisal Journal*, LXII (3), pp.402 – 409.

Payne J. 1997, Corporate Property Manager, Dulux Australia, interview, 12 February.

Pearce D.W. & R. Turner K. 1990. *Economics of Natural Resources and The Environment*, London: Harvester Wheatsheaf

Pearce, F. 1992b, Sitting On A Toxic Time Bomb, *New Scientist*, 15 August, p.12.

Pearce, F. 1992a, Worst first on list of contaminated land, *New Scientist*, 8 August, p.5.

Pearson L. 1996, Amendments to the Environmental Planning and Assessment Act, *Environmental and Planning Law Journal*, pp. 343 – 347.

Pedersen P. 1995, Contaminated property appraisals – a practical guide to minimizing liability, The Canadian Appraiser, Fall, pp. 19 – 27.

Penrith City Council, 1998, State of the Environment Report 1998 – 97.

Perrings C. 1995, Ecological and Economic Values, *Environmental Valuation: New Perspectives*, Wills, K.G. & Corkindale, J.T. (ed), Cab International.

Phyrr S.A. 1973, A Computer Simulation Model to Measure the Risk in Real Estate Investment, (cited in Cooper J.R. 1974, *Real Estate Investment Analysis*, Lexington Books, Chapter 13).

Pick J. & Wells K. 1993, Toxic Chemicals Use Reduction Legislation for Victoria, *Environmental and Planning Law Journal*, 10(3), pp. 171 – 184.

Powell. I. (NSW EPA), cited in Waste Management and Environment 1993, *Contaminated Sites*, April, p.24.

Power T. & Dwyer M. 1998, Recent Developments in the Regulation of Contaminated Sites and their Commercial and Valuation Implications, *The Valuer & Land Economist*, 35 (1), pp. 8 -11.

Prisk M. 1998, How to unlock the potential of brownfield sites, *Chartered Surveyor Monthly*, October, p. 25 – 26.

Property Council of Australia 1999, *Commercial and Industrial Property Management Award.*

Quigg L. 1991, *Optimal Land Development*, Working Paper, February, Office of Real Estate Research, University of Illinios, Champaign, IL. (cited in Lentz & Tse 1995).

Raff M. 1995, The Renewed Prominence of Environmental Impact Assessment: "A Tale of Two Cities", *Environmental and Planning Law Journal*, 12(4), pp. 241 – 263.

Ragsdale C.T. 1995, *Spreadsheet Modeling and Decision Analysis*, Cambridge M.A. Course Technology.

Ramsay, P.J. 1998, Peter J Ramsay & Associate Pty Ltd, Appointed Environmental Auditor, Victoria, Interview, 13 August.

Ramsay R. & Rowe G.C. 1995, *Environmental Law and Policy in Australia -- Text and Materials,* Butterworths.

Reichert A.K. 1996, *An Analysis of the Impact of Environmental Hazards Upon Residential Property Values: Guidelines for Real Estate Professional*, Paper presented at the American Real Estate Society Annual Meeting, Lake Tahoe, March.

Reichert A.K. 1997, Impact of a Toxic Waste Superfund Site on Property Values, *The Appraisal Journal*, LXV (4), pp.381 – 392.

Reichert A.K. 1998, *A Comparison of Alternative Modelling Approaches when Estimating Environmental Damages*, Paper presented at the American Real Estate Society Meeting, Monterey, California, April.

Richards I. 1995, Lands of opportunity, *Estate Gazette*, Issue, 9536, pp. 130 – 131.

Richards, T. 1996a, Valuing contaminated land and property: theory and practice, *Journal of Property Valuation & Investment*, 14(4), pp. 6 – 17.

Richards T. 1996b, Contaminated land: more certainty, less chance, *Chartered Surveyor Monthly*, February, p. 25.

Richards T. 1997a, Beware the contamination factor in valuation, *Chartered Surveyor Monthly*, May, pp. 28 – 29.

Richards, T. 1997b, *An Analysis of the Impact of Contamination and Stigma on the Valuation of Commercial Property Investment*, unpublished thesis, University of Reading.

Richey J.S., Mar B.W. & Horner R.R. 1985, The Delphi technique in environmental assessment implementation and effectiveness, *Journal of Environmental Management*, 21.

Roddewig R. 1996, Stigma, Environmental Risk and Property Value: 10 Critical Inquiries, *The Appraisal Journal*, LXIV (4), pp.375 – 387.

Roddewig R. 2000, Adjusting Environmental Case Study Comparables by Using an Environmental Risk Scoring System, *The Appraisal Journal*, LXVIII(4), pp. 371 – 374.

Rodricks J.V. 1992, *Calculated Risks: understanding the toxicity and human health risks of chemicals in our environment*, Cambridge.

Rost R.O. & Collins H.G. 1984, *Land Valuation and Compensation in Australia*, 3rd edition. Reprinted 1990, Australian Institute of Valuers and Land Economists.

Rowe G.C. & Seidler S. (ed.) 1993, *Contaminated Sites in Australia: Challenges for Law and Public Policy*, Allen & Unwin Pty Ltd.

Rye J. 1998, Tackle contamination with confidence – and an LQS, *Chartered Surveyor Monthly*, May, p. 37.

Saaty T.L. 1980, *The Analytic Hierarchy Process*, New York: McGraw Hill.

Saaty T.L. & Forman E.H. 1992, *The Hierarchon A Dictionary of Hierarchies*, The Analytic Hierarchy Process Series, Vol. V, RWS Publications.

Saaty T.L. 1994, *Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process,* The Analytic Hierarchy Process Series, Vol. VI, RWS Publications.

Saaty T.L. 1995, *Decision Making for Leaders The Analytic Hierarchy Process for Decision in a complex world,* The Analytic Hierarchy Process Series, Vol. II, RWS Publications

Saaty T.L. 1996, *The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation*, The Analytic Hierarchy Process Series, Vol. I, RWS Publications

Saaty T.L. & Kearns K.P. 1985, *Analytic Planning The Organisation of System*, The Analytic Hierarchy Process Series, Vol. IV, RWS Publications.

Saaty T.L. & Vargas L.G. 1991, *The Logic of Priorities Applications of The Analytic Hierarchy Process in Business, Energy, Health & Transportation*, The Analytic Hierarchy Process Series, Vol. III, RWS Publications.

Saaty T.L. & Vargas L.G. 1994, *Decision Making in Economic, Political, Social, and Technical Environments with the Analytic Hierarchy Process*, The Analytic Hierarchy Process Series, Vol. VII, RWS Publications.

Sanders M.V. 1996, Post-Repair Diminution in Value from Geotechnical Problems, *The Appraisal Journal*, LXIV (1), pp.59 – 66.

Salvatore, D. & Diulio, E.A., 1996, *Principles of Economics*, 2nd edition, McGraw-Hill.

Schaffer R. 1996, Eco-efficiency systems are now paramount, *Waste Management & Environment Source Book*, pp. 29 – 45.

Schwaiger B. 1993, Lenders' Concerns And Requirements To Reduce Environmental Risks, *The Valuer And Land Economist*, 32 (8), p.588 - 595.

Self P. 1995, The Australian Urban And Regional Development Review, *Australian Planner*, 32(3), pp. 139 – 145.

Seneca J.J. & Taussig M.K. 1974, *Environmental Economics*. New Jersey: Prentice-Hall.

Shankie-Williams N. 1992, Developer Contributions, *Australian Planner*, March, p. 33 – 34.

Sheard E.M. 1996, Valuation of Contaminated Land: the Valuer's role, *Journal of Property Development*, 1(1), pp. 11 – 16.

Simm, G. (1992) Problems for the valuation surveyor, paper presented at *Seminar on 'Environmental Assessment'*, Sheffield City Polytechnic, 5 March 1992 (cited in Syms 1997b).

Simons R. 1994, How Clean is Clean? *The Appraisal Journal*, LXII(3), pp. 424 – 438.

Simons R. 1996, *Financing Environmental Contaminated Land Redevelopment in the Great Lakes Urban Empowerment Zones*, paper presented at the annual meeting of the American Real Estate Society in Lake Tahoe, Nevada, March.

Simons, R. A. 1998, *Turning Brownfields Into Greenbacks*, Urban Land Institute.

Simons, R., Bowen, W., & Sememtelli, A. 1997, The Effects of Underground Storage Tanks on Residential Property Values, *Journal of Real Estate Research*, 14 (1), pp.29 – 42.

Smith R. 1996, Cleaning up Down Under – the valuable lessons, *Waste Management & Environment Source Book*. pp. 67 – 72.

Smith S. 1995, Doing Time for Environmental Crimes: The United States Approach to Criminal Enforcement of Environmental Laws, *Environmental and Planning Law Journal*, 12(3), pp. 168 – 182.

Smolen G., Moore G. & Conway L. 1992, Economic Effects of Hazardous Waste Landfills on Surrounding Real Estate Values, *Journal of Real Estate Research*, 7 (3), pp.283 – 295.

Spencer J.A. 1993, Standard for Valuation of Contaminated Land in Australia, *The Valuer And Land Economist*, 32 (8), pp.585 – 587.

Staib R. 1998, ESD and Urban Infrastructure, *The Valuer & Land Economist*, 5 (1), pp. 19 - 23.

Streeting M. 1993, Instruments For Environmental Management, *Australian Planner*, March, pp. 24 – 28.

Stretton, H. 1999, *Economics: A New Introduction*, UNSW Press.

Sutherland T. 1995, Artic Oil Spill Clean Up Races To Beat The Thaw, *The Weekend Australian*. 29 – 30 April, P. 4.

Syms P.M. 1996a, Dealing with contaminated assets, *Estates Gazette*, Issue 9612, pp.124- 125.

Syms P.M. 1996a, The Valuation of Contaminated Land: the Problems Caused by Lack of Accessible Data in the United Kingdom, *Journal of Property Development*, 1(1), pp. 17 – 25.

Syms P.M. 1996b, Property professionals and their perceptions, *Estate Gazette*, Issue 9643, pp. 146 – 148.

Syms P.M. 1996b, *The Valuation of Contaminated Land: the Problems Caused by Lack of Accessible Data in the United Kingdom*, Journal of Property Development, 1 (1), pp.17 – 25.

Syms P.M. 1996c, The Effect of Industrial Contamination on Residential Land Values in the United Kingdom, *Land Contamination & Reclamation*, 4(1), 49 – 56.

Syms P.M. 1997a, Perceptions of risk in the valuation of contaminated land, *Journal of Property Valuation & Investment*, 15 (1), pp.27 – 39.

Syms P.M. 1997b, *Contaminated Land*, Blackwell Science.

Syms P.M. 1998, Redeveloping contaminated land: the policy options, *Chartered Surveyor Monthly*, July/August, p. 38.

Thampapillai D.J. 1993, *The Valuation of Environmental Goods and Services*, paper presented to the NETTLAP Workshop in Environmental Economics United Nations Environment Programme, Singapore, October.

The Clough Engineering Group 1995, *A Review Of The Australian Contaminated Sites Industry For Project Development And Technology Diffusion Network.* http://www.eiudn.com .au/eidn2d.htm, 20 November 1999.

The Economist 1991, Nightmare In Acacia Avenue, 20 July, p.71

The Royal Institution Of Chartered Surveyors (RICS) 1997, *Contamination And Its Implications For Chartered Surveyors: A Guidance Note.*

The Weekend Australian. 1996, 20 -21 April, p.25

Thomson J. 1992, Criminal and Civil Consequences of Corporate Environmental Policies in Western Australia, *Environmental and Planning Law Journal*, 9(2), pp. 111 –121.

Tibor T. & Feldman I. 1995, *ISO 14000 A Guide to the New Environmental Management Standards*, Irwin Professional Publishing.

Tietenberg T. 1994a, *Environmental Economics and Policy.* New York: Harper Collins College Publishers.

Tietenberg T.H. 1994b, *Economics and Environmental Policy*, England: Edward Elgar Publishing Ltd.

Tisdell, C. 1993 *Environmental Economics: Policies For Environmental management And Sustainable Development*, England: Edward Elgar.

Tkach R.J. & Simonovic S.P. 1997, A New Approach to Multi-criteria Decision Making in Water Resources, *Journal of Geographic Information and Decision Analysis*, 1(1), pp. 25 – 3.

Triantaphyllou E. & Sanchez A. 1997, A Sensitivity Analysis Approach For Some Deterministic Multi-criteria Decision Making Methods, *Decision Sciences*, 28 (1), pp.151 – 194.

Tromans S. & Turral-Clarke R. 1994, *Contaminated Land.* London: Sweet & Maxwell.

Turezynowiez L. 1991, *Approaches To Analyte Selection*, Proceedings of a National Workshop on the Health Risk Assessment and Management of Contaminated Sites, South Australian Health Commission, Adelaide, pp. 31-51.

Turner N. 1995, Criminal liability for damage, *Estate Gazette*, Issue 9547, pp. 143 – 145.

Turner N., Bennet L., Prescott G. & Gronow S. 1994, Assessing and Managing the Environmental Risks of Property Ownership, *Property Management*, 12(2), 4 – 15.

Turner, R. K., Pearce, D. & Bateman, I. 1994, *Environmental Economics: An Elementary Introduction*, London: Harvester Wheatsheaf.

United States Environmental Protection Agency (USEPA), 2000, *Superfund: 20 Years Of Protecting Human Health And The Environment*, http://www.epa.gov/superfund/action/20years, 23 May 2001.

Vandeman, M. 1998, *Mining in Kakadu National Park World Heritage Area!* http://csf.Colorado.edu/mail/deep-ecology/sep98/0059.html, 18 May 2001.

Victoria Environment Protection Authority (Vic EPA) 1992, *Environmental Audit System Contaminated Land Explanatory Notes*, EPA Information Bulletin.

Victoria Environment Protection Authority (Vic EPA) 1997a, *Prevention And Management Of Contamination Of Land*, Issues Paper, February, Publication 527.

Victoria Environment Protection Authority (Vic EPA) 1997b, *Environmental Auditor (Contaminated Land) Appointment Guidelines*, EPA Information Bulletin.

Victoria Environment Protection Authority (Vic EPA) 1998a, *Draft State Environment Protection Policy (Prevention and Management of Contamination of Land) and Draft Policy Impact Assessment*, http://www.epa.vic.gov.au, 24 September 1999.

Victoria Environment Protection Authority (Vic EPA) 1998b, *Pro Forma Certificate And State Of Environmental Audit.*

Victoria Environment Protection Authority (Vic EPA) 1999a, *Scheduled Premises*, http://www.epa.vic.gov.au/industry/schedprem.htm, 15 April 2000.

Victoria Environment Protection Authority (Vic EPA) 1999b, *Preventing and Managing Contaminated Land (Prevention and Management of Contamination of Land and Draft Policy Impact Assessment)* January, http://www.epa.vic.gov.au, 24 February 2000.

Victoria Environment Protection Authority (Vic EPA) 1992, *Guidelines For Environmental Auditors Contaminated Land Issue Of Certificates Of Environmental Audit*, EPA Information Bulletin.

Waddel S. 1996, Equitable Resolution of Contaminated Land Disputes, *Environmental and Planning Law Journal*, 13(5), pp. 348 – 363.

Ward M.L. 1998, *A New Face for An Old Site: The Redevelopment of the Old Balmain Power Station*, Project Work, University of Western Sydney, Hawkesbury.

Weber B.R. 1997, The Valuation of Contaminated Land, *Journal of Real Estate Research*, 14 (3), pp.379 – 398.

Weir M.J. 1994, Putting the Environment into the Queensland Local Government (Planning and Environment) Act, *Environmental and Planning Law Journal*, 11(5), pp. 409 – 419.

Welsh, L. 1997, Brown to Green blueprint, *The Canadian Appraiser*, 41(1), pp. 43 – 45.

Wendt P.F. 1974, *Real Estate Appraisal Review And Outlook*, University of Georgia Press.

Wensing E. 1992, Landlords And Land Use Controls In The Act, *Australian Planner*, July, pp. 63 – 69.

Wenstop F. 2000 *Multi Criteria Decision Analysis Theory*, www.bi.no/users/fag87027/mcdm/ mcdm.ppt, 29 February 2000.

Westerman H.L. 1988, Planning and Control of Hazardous Industries, *Planner*, 3(7), pp. 47 – 50.

White, S. (ed.) 1980, *Planning and Development Service (New South Wales)*, The Law Book Company Limited.

Whitmore, H. 1981 *Local Government And Environmental Planning Law in New South Wales*, The Law Book Company Limited.

Wilbourn P. & Hirst P. 1996, The Red Book and contaminated land, *Estate Gazette*, Issue 9606, pp.134 – 135.

Wilbourn P. 1995, A New Framework For Contaminated Land. *Chartered Surveyor Monthly*, September, p.28.

Wilcher Robert 1996, Reducing the risk of buying or selling contaminated land, *Waste Management & Environment Source Book.*

Williams J.T. 1991, Real estate Development as an Option, *Journal of Real Estate Finance and Economics*, 4 (2), pp.191 – 208.

Willis K.G. & Corkindale, J.T. (ed.) 1995, *Environmental Valuation: New Perspectives*, Cab International.

Wilson A.R. 1992, Environmentally Impaired Valuation: A Team Approach To a Balance Sheet Presentation, *Technical Report: Measuring the Effects of Hazardous Materials Contamination on Real Estate Values: Techniques and Applications*, Appraisal Institute, pp.23 – 42.

Wilson A.R. 1994, The Environmental Opinion: Basis for an Impaired Value Opinion, *The Appraisal Journal*, LXII (3), pp.410 – 423.

Wilson D.C. 1996, Highest and Best Use: Preservation Use of Environmentally Significant Real Estate, *The Appraisal Journal*, LXIV (1), pp. 76 – 86.

Wiltshaw D.G. 1996, An economic analysis of contaminated land, remediation and liability, *Journal of Property Research*, 13, pp.131 – 141.

Wiltshaw D.G. 1998, Stigma, perception and the remediation of contaminated land, *Journal of Property Research*, 15(4), pp. 285 – 303.

Wood G. 1995, Contaminated Land And The Surveyor. *Chartered Surveyor Monthly*, April, p. 25.

Young B. 1992, Homebush Bay Master Plan, *Australian Planner*, December, pp. 221 – 226.

Zell S. 1997, Zell turns the spotlight on 'faulty' valuation process, *Estate Gazett*, 15 February, 07EG57.