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**The Impact of Environmental Planning on
the Value of Contaminated Land**

By

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Abstract:

In recent years, more and more contaminated sites in Australia are redeveloped for alternative uses. In Sydney, well-located former industrial sites, especially those with waterfront, are sought after for redevelopment. For example, the former Shell depot at Pulpit Point has been redeveloped for up market residential use. The former Cabarita ICI Dulux paint factory site at Concord is being cleaned up for similar redevelopment. Other notable redevelopment of contaminated land includes the former sites of the Ammunition Depot, the State Abattoir and the State Brickworks, which have been cleaned up and used for the venue of Olympic Games 2000. No doubt environmental planning has a significant impact on the recycling of those sites. Since environmental planning control is one of the factors that determines the highest and best use of land, it has significant impact on the value of property, including contaminated land.

In this paper, the evolution of environmental planning in Australia, its impact on the value of contaminated land, and its adequacy, strengths and weaknesses for controlling the use and development of contaminated sites are studied. It is intended to give readers an appreciation of the impact of environmental planning control on contaminated land value. Contaminated land is regarded as a special class of real estate, its value is looked at from a market value point of view. Environmental issues other than contaminated land are outside the scope of this study. The Commonwealth, New South Wales, Victoria and Queensland environmental planning laws are cited where necessary.

1. Introduction

With the increasing awareness of environmental issues, people have demanded more to be done to stop degradation of the environment. Among other measures, the public demand and expectation have led to the introduction of environmental planning. Environmental planning is a modern system of town planning. It differs from the old land use planning and town and country planning in that protection of the environment are now key objectives of land use control and long term development. Emphasis is now aimed at achieving ecologically sustainable development within the country.

In recent years, more and more contaminated sites are redeveloped for alternative uses. In Sydney, well-located former industrial sites, especially those with waterfront, are sought after for redevelopment. For example, the former Shell depot at Pulpit Point has been redeveloped for up-market residential use. The former Cabarita ICI Dulux paint factory site at Concord is being cleaned up for similar redevelopment. Other notable redevelopment of contaminated land includes recycling of the former sites of the Ammunition Depot, the Newington Abattoir and the State Brickworks at Homebush Bay for the venue of the Olympic Games 2000. No doubt environmental planning has a significant impact on the fate of those sites. Since environmental planning control is one of the factors that influences the highest and best use of land, it has significant impact on the value of property, including contaminated land.

In this paper, the evolution of environmental planning in Australia, its impact on the value of contaminated land, and its adequacy, strengths and weaknesses for controlling the use, development of contaminated sites are studied. It is intended to give readers an appreciation of the impact of environmental planning control on contaminated land value. Contaminated land is regarded as a special class of real estate, its value is studied from a market value point of view. The Commonwealth, New South Wales, Victoria and Queensland environmental planning laws are cited where necessary.

2. Evolution of Environmental Planning in Australia

Environmental planning is an extension of traditional town planning. Town planning has a long history that can be traced back to the construction of ancient planned cities in the China, India, and the Middle East (Compton's Interactive Encyclopedia, 1994). It is defined in the Macquarie Dictionary as "the calculated control of urban physical conditions in the social interest of the community at large" and in the Concise Oxford Dictionary as "the preparation of plans for regulated growth and improvement of towns" (cited in Gifford & Gifford, 1987, p. 2.4)

Town planning in Australia can be traced back to the early days of the century with a view to "create a better physical environment in our towns and cities by providing people with pleasant structures in which to live and work, and adequate recreational facilities, including open space" (Ferrier, 1993, p. 24).

Early Australian town planning was implemented in different ways after it became a British colony. For example, the City of Adelaide was planned before the city was built whereas the early Sydney City was developed in a rather haphazard manner. Land use was later regulated by the Local Government Act in the States and Territory. For instance, in NSW, s. 309 of the Local Government Act 1919 empowered the government to proclaim 'Residential Districts' and control land use activities within these districts.

2.1 Influence from Britain

Australian town planning in the early days was deeply influenced by the development of town and country planning in Britain. After the Second World War, there was a new realisation of social and economics needs in Australia (Winston, 1957). Modelled on the British planning concept, a 'prescriptive' approach based on zoning and rezoning was adopted in Australia (Cardew, 1997). In 1945 the Local Government (Town and Country Planning) Amendment Act was passed in NSW. The objective was to facilitate preparation of statutory land-use plans, a framework for local planning schemes, for metropolitan Sydney (Freestone, 1992). As a result, a central planning authority, the Cumberland County Council (CCC), was created.

The CCC eventually prepared the County of Cumberland Planning Scheme that came into effect on 27 June 1951. Gunther & Churchill (1990, p. 8.3) comments that it was "New South Wales's first organised, coordinated legislation specifically designed for town planning". Similar planning schemes were also prepared in other States, such as the Melbourne Metropolitan Planning Scheme (1954), the Plan for the Metropolitan Region of Perth and Fremantle (1955) and the Adelaide Development Plan (1962) (Alexander, 1982).

In the late 1960s there were moves in Australia towards strategic planning (statement of principle, policies and broad strategy) from the prevailing metropolitan planning scheme. Logan (1984, p.47) considers that the trend "reflects a concern by planning authorities to be seen to be acting rationally in their approach to long-term decision-making, as well as a response to demands from an increasingly critical public for more rigorous justification of planning decisions." To achieve the planning goal, a 'performance standard' approach was adopted. It keeps on monitoring and evaluating the effect of land use and development control under statutory planning (Cardew, 1997).

At the about same time, concern for the environment is increasing. Environment is defined in the Longman Modern English Dictionary as "surroundings, esp. the material and spiritual influences that affect the growth, development and existence of a living being". The word is also defined in various Australian laws. For example, it is defined in s. 4 of both the Environmental Protection (Impact of Proposals) Act 1974 (Cth) and the Environmental Planning and Assessment Act 1979 (NSW) to include "all aspects of the surroundings of man, whether affecting him as an individual or in his social groupings". Section 4 of the Environment Protection Act 1970 (Vic) defines it as the "physical factors of the surroundings of human beings including the land, water, atmosphere, climate,

sound, odours, tastes, the social factor of aesthetics... the biological factors of animals and plants”.

2.2 Influence from the USA

The rapid deterioration of the environment since the turn of the century has fostered the idea to incorporate into town planning environmental considerations such as:

- “a) preservation of a worthwhile environment for the individual (the preservation and enhancement of amenity);
- b) protection of the environment generally;
- c) conservation of resources;
- d) co-ordination and planning of transport and industry.”

(Whitmore, 1981. p. 123)

As far as protection of the environment is concerned, there is a shift towards the requirements of conducting an environmental impact assessment (EIA) in accordance with laid-down procedures (Ramsay & Rowe, 1995). The concept of EIA was originated in the National Environment Policy Act 1969 in the USA (Hollick, 1986). In short, an EIA is seen as an administrative process by which the environmental impact of a project is determined (Leeson, 1994). This new concept was introduced into Australia in the 1970s (Munchenberg, 1994).

The birth of environmental planning in Australia

Despite its limited influence on planning matters in the States and Territory, the Federal Government was the first in Australia to formally adopt the environmental impact assessment requirement and passed the Environmental Protection (Impact of Proposals) Act (EP(IP)A) in 1974. This Act is the Commonwealth government’s principal legislation in respect of environmental planning matters (Fowler, 1996).

The Act is not intended to interfere with the day to day land use and development control function of the local governments in the States and Territory. Instead it requires Commonwealth projects or proposals, which are matters likely to affect the environment to a significant extent, be subject to an EIA. The Minister is also required to ensure the outcomes from the assessment process are taken into consideration when making decision or taking action.

Following the Commonwealth government’s lead, the State and Territory governments gradually amended existing planning laws or passed new laws to incorporate environmental considerations into their planning system. Protection of the environment has been formally stated as an objective in relevant environmental planning laws, such as s. 5 of the Environmental Planning and Assessment Act 1979 (NSW) (EPAA), s. 4(1) of the Planning and Environment Act 1987 (Vic) (PEA), and s. 1.3 (a) of the Local Government (Planning and Environment) Act 1990 (Qld) (LG(PE)A).

2.3 Current Environmental Planning Control

Environmental planning aims at, *inter alia*, balancing economic development and protection of the environment. To achieve the goals, it is necessary to plan prudently and control all development. Development and land use control from the former planning systems are considered applicable and retained in environmental planning. Land uses are designated in local environmental plans via zoning and rezoning process. Besides separating less intensive land uses from more intensive uses, clean land uses are also separated from dirty ones. Unless prior development consent has been obtained, no development can begin. On the other hand the public has more involvement in the environmental planning process.

Regarding public participation, councils must notify the public about any draft environmental plan and development applications. Apart from lodging an objection or submission in respect of any amendment/preparation of environmental plan and development application, some environmental planning laws allow the public to enforce provisions of the laws. For example, “s. 123 of the [EPAA] enables any person to bring proceedings to enforce the forward planning and project control provision of the Act” (Kulakowski & others, 1992, p.305).

In the course of processing development applications, the environmental planning laws oblige the planning consent authorities to consider, *inter alia*, environmental issues. For example, s. 90(1)(g) of the EPAA requires the consent authority to consider “...whether the land to which that development application relates is unsuitable for that development by reason of its being, or being likely to subject to flooding... or to other risk”. The meaning of risk is not defined in the Act.

In a recent case *Alec Finlayson Pty Ltd v Armidale City Council* (1994) 84 LGERA 225, the council was found negligent for approving homes to be built on contaminated land. It was held that s.90 imposes a duty of care on the councils to consider the unsuitability of the land by reason of its being subject to any risk. It is now well accepted that this ruling effectively includes health risk from contaminated sites within the meaning of “other risk” in the Act.

Similar provision is found in the environmental planning law in other States. For example, in Victoria, s. 60 of the PEA requires the authority to consider “any significant effects which the responsible authority considers the use or development may have on the environment...”(s. 60(1)(a)(iii)).

In Queensland, s. 8.2(1) of the LG(PE)A imposes the following duty on a local authority:

“when considering an application for its approval...to take into consideration whether any deleterious effect on the environment would be occasioned by the implementation of the proposal, the subject of the application.”

To comply with the above legal requirement, the consent authority in the States and Territory have to examine the land use history of the site and the respective EPA's contaminated land register for hints about possible contamination on the site. Reference is also made to published planning documents and guidelines. In NSW, the State Environmental Planning Policies No. 33 and 38, Regional Environmental Planning No. 1 and 9, and the "Planning Guidelines For Contaminated Land" (October 1995) are the documents that help local councils deal with contaminated land issues.

In Victoria the Ministerial Directive No. 1 and 2 are the relevant planning guidelines for contaminated sites. The latest development is that the Victoria EPA published an Issues Paper "Prevention and Management of Contamination of Land" in February 1997. It is proposed that a State Environment Protection Policy (SEPP) for land contamination be made to "provide a coherent set of goals and a clear administrative framework for both the prevention and mitigation of contamination of land." (Vic EPA, 1997, p. 2).

In Queensland, there is no environmental planning guideline or state planning policy in respect of contaminated land issues. The "Technical Guidelines for the Assessment and Management of Contaminated Sites", issued by the Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council (commonly known as the ANZECC standards), is used by local council for guidance.

Where the land is considered contaminated or potentially contaminated, the consent authority may require the applicant to submit an EIA document for consideration. Table 1 below outlines the document required under various environmental planning laws:

Table 1

EIA Document	Consent Authority	Relevant Statutes
Environmental Impact Report	the Action Minister of the Commonwealth government (for Commonwealth proposals or projects only)	Sections 5, 6, & 8 of EP(IP)A
Environment Impact Statement	Local councils in NSW	Sections 77(3), & 112(1) of EPAA
Environmental Effects Statement/Preliminary Environment Report	Local councils in Victoria	Sections 3 & 8 of the Environment Effects Act 1978
Environment Impact Statement	Local councils in Queensland	Section 9.2(15) of LG(PE)A

The consent authority is empowered to grant consent with or without conditions, or to

refuse granting consent. Some environmental planning laws allow the condition attached to the consent to require works to be carried out. For example, Section 91(3)(f) of the EPAA provides that the council may “require the carrying out of works ... relating to any matter referred to in section 90(1) applicable to the development the subject of the consent”. Accordingly the works may include works to control the discharge of contaminants, stabilise and contain contamination, or clean up the site, etc.

Regarding contaminated land information, the local councils do not keep a contaminated land register. It is the business of the respective EPA in the States. However any person interested may, on payment of the prescribed fee, apply to the council for a planning certificate in respect of any land within the council area. The contents of the certificate are specified by the relevant laws and differ from state to state. In NSW, s. 149(5) of the EPAA requires the council to “include advice on such other matters affecting land of which it may be aware” in the certificate. Thus information such as whether the land is contaminated is included in the certificate. (White, 1980) Similar provision is not found in the Victorian and Queensland laws.

3. Environmental Planning and Property Value

Environmental planning is introduced with a view to address the deficiencies of the old planning systems. One its objectives is to strike a balance between economic development and protection of the environment. As such it has a significant impact on the property market. The sections below look at the rationale of environmental planning and how it affects land value.

3.1 The Rationale of Environmental Planning

In economics, land is a factor of production and has value because of its scarcity and utility to human beings. In the absence of planning and land use control, landowners and developers are free to determine the use of their land. More often than not land use will be driven by economic benefits, ie; the land will be put to the use that will yield the highest economic return.

In general, personal benefit and interest are the driving forces. Neither social and cultural needs, nor public services and utilities form part of the landowners/developers’ objectives. What they conceived as the highest and best use does not necessarily mean the highest and best use to the community. Apart from wasting resources, the developments are likely to leave environmental problems to the future generations. For example a developer may build a factory within a residential area to secure the supply of labour. People in the neighbourhood will suffer from fumes, smoke, odour, heat, vibration and other noxious contaminants emanating from the factory.

As mentioned above, environmental planning incorporates development control that looks at the environment as a whole. As far as the regulation of land use is concerned, it inherits the land use control mechanism from previous planning systems. Land uses are not only planned with regard to economic, social and cultural needs but also the physical living

environment and the ecological system.

Since the 1992 Earth Summit in Rio de Janeiro, signatories, including Australia, are committed to ensure 'ecologically sustainable development' within their country. Sustainable development is defined in the United Nations World Commission's Brundtland Report (1987) as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (cited in Ratcliffe & Stubbs, 1996, p. 142).

Environmental planning is considered as one of the means to achieve the goal. Through environmental planning, governments attempt to address deficiencies of the market mechanism, control negative externalities and minimise waste of resources. Various methods such as directing and encouraging developments by planning the use of land and controlling development accordingly, and the provision of public goods like national parks, public reserves, schools, roads, community facilities, sewerage treatment plant, etc. are used to fulfill the goal

While it may be true that private landowners and developers can shape the built environment without planning guidance, the lack of coordination between individual developments and compatibility consideration will lead to unsatisfactory results. Furthermore certain developments cannot be achieved without the help of environmental planning. For example, the private sector can do very little to initiate a comprehensive redevelopment of a run down urban area. The job is best done by the public sector under environmental planning.

In New South Wales, the State government has implemented an urban consolidation program to revitalise declining inner city areas and encourage recycling of disused industrial land into new uses. Similarly the Federal Government initiated the Better Cities Program in 1991 to promote economic growth and ecologically sustainable development, improve social justice and urban environment (Commonwealth Department of Housing And Regional Development. 1995). The success of these schemes is hinged on the preparation of relevant environmental planning programs.

Environmental planning is by no means perfect and is not intended to make good all social and economic deficiencies. However, through careful planning and implementation, it helps stimulate economic growth, improve the living and work environment, and protect the environment at large. Furthermore it minimises uncertainty to development such that owners and developers know what development/use is permitted on the land.

3.2 Impact of Environmental Planning on Land Value

Land is a valuable asset; it has value because of its scarcity and utility to human beings. It is a special class of asset which, depending on the circumstances, may have more than one value, such as monetary value and intangible value. From a real estate point of view, land may have market value, existing use value, investment value, mortgage value, insurable value, book value, statutory value, etc. In this paper, real estate value is under study and

market value is used to mean land value.

Before March 1993, the Australian property industry relied on the court ruling in *Spencer v The Commonwealth of Australia* (1907) 5 C.L.R. 418 for the definition of market value. In short, the High Court defined market value as “the price which a property could be expected to realise if sold by a willing but not anxious seller to a willing but not anxious buyer at the date at which the value is required to be ascertained.” (Rost & Collins, 1984, p37).

In March 1993, Australia became a signatory and accepted the market value definition of The International Assets Valuation Standards Committee (Denton, 1993). The new definition defines market value as “the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion”.

The market value of a property is assessed on the basis of its highest and best use. The highest and best use is defined by the Appraisal Institute (1992, p.45) as “the reasonably probable and legal use of vacant land or improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value.” There are several factors that determine the highest and best use of land. They include location, market demand, legal constraints, physical characteristics of the land, construction technology, and availability of finance (Friedman & Ordway, 1981).

Environmental planning control is one of the legal constraints that limits the highest and best use of a piece of land. Through land use zoning and development application (development control) requirements, the government can control the land use and determine whether a particular development should be allowed.

Consider a parcel of land that is in the best location for a particular type of development. There is strong market demand for the proposed development and there is no problem with other determining factors. All these indicate that the development is feasible and the land should have a high value. However if the proposal does not conform to the land use control of the land, the development cannot go ahead and the expected highest and best use value cannot be realised.

It is interest to note that land use restriction may also enhance land value. The restriction may limit the supply and lead to a shortage of a particular class of property. If market demand is not reduced the value of existing land with permission for that use will be increased. As shown in the following paragraphs land value may also be intentionally increased by the operation of land use control.

The land use control plan, commonly known as the zoning plan, is an important document. It shows the intention of the government to allow prescribed developments to take place. The government may encourage or discourage a particular development to take place on a

site by making a provision on the zoning plan or changing the zoning of the land. The permitted land uses may enhance or decrease the value of the land concerned. Value enhancement may occur directly and indirectly. For example, if the government wants to encourage recycling of disused industrial sites, the sites can be rezoned for more profitable uses such as residential or commercial. Value is therefore directly added to the land. Alternatively, the permitted development in an area may enhance the value of the adjacent land. For example, if a parcel of government land is zoned for public reserve, the value of the nearby residential land is indirectly enhanced.

The permitted uses on the zoning plan may also have a detrimental effect on land value. The value loss may be due to incompatible developments, such as the carrying out or intended carrying out of public use or works in the neighbourhood. For instance, the nuisance from a freeway, an airport, or a sewerage treatment plant, etc. may have a significant impact on the value of nearby residential properties.

Where the government announces the scheme long before the actual carrying out of the works, the value of the land nearby may drop substantially during the intervening period. Land value loss of this nature is said to be due to “planning blight”. For example, in *E.A. Woollams & Anr v The Minister* (1957), 2 L.G.R.A., the government’s scheme to construct the Warragamba Dam in Sydney was made known to the public in 1942 and the plaintiff’s land was not acquired for the project until 1954. The plaintiff’s land value was substantially decreased due to the scheme over the period. While in this case the land was not resumed under the planning law, it highlights the impact of “planning blight” on land value.

3.3 Impact on Contaminated Land Value

The use and development of contaminated land are governed by the relevant environmental plans and other environmental laws. The owner of a contaminated site may decide to continue the existing use on the site. Since it does not involve new development, there is little control under the local environmental plan. However the use is still governed by other environmental laws such as the Environmentally Hazardous Chemicals Act 1985 (NSW), Environmental Offences And Penalties Act 1989 (NSW), Unhealthy Building Land Act 1990 (NSW), Environment Protection Act 1970 (Vic), and Contaminated Land Act 1991 (Qld), etc. These laws govern the creation, storage and discharge of pollutants arising from the activities on the land.

When the owner wants to expand the existing use or redevelop the contaminated site for alternative use, the proposal is subject to the control of the local environment plan and a development approval is required. The consent authority may require the applicant to provide further information about the site, including an environmental impact assessment (EIA) document, for consideration. To submit an EIA document, the applicant has to commission an environmental expert to carry out the study and prepare the document. In an analysis of EIA timing under the South Australia Planning Act 1982, Harvey (1994) finds that the mean time for preparing an EIA document is 34 weeks, and preparation of a

supplement is 21.5 weeks.

While the details of individual EIA document may vary, the frameworks are similar as they are prescribed in the relevant environmental planning legislation. For example, Schedule 2 of the Environmental Planning and Assessment Regulation 1994 (NSW) prescribes the contents of an environmental impact statement. Among other information, the following must be included in an environmental impact statement:

- a) a full description of the development or activity;
- b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected;
- c) the likely impact on the environment of the development or activity; and
- d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment

The time required to process the development application for a contaminated site could be long. Generally planners do not have the expertise to scrutinise the EIA document. Unless the consent authority has an in-house environmental specialist, it has to refer the document to the EPA or hire a private environmental consultant for advice. In addition, the public has to be notified about the proposal. This may subsequently lead to a public inquiry. In certain contentious cases, extra time may be needed in getting the application adjudicated by the court.

To find out the consent authority's attitude towards contaminated land and the time required to grant planning approval, the Sydney metropolitan area was chosen for a case study. A survey was conducted in September 1996. Questionnaires were sent to the 40 local councils in the Sydney metropolitan area. Nineteen (19) councils responded to the survey. The responses are summarised in Table 2 and 3 below:

Table 2

Question:			
Is there any contaminated land within the council area?			
Yes	No	No answer	Total
17	1	1	19
89.5%	5.25%	5.25%	100%
Question:			
Does the council treat contaminated or potentially contaminated land differently?			
Yes	No	No answer/Neutral	Total
6	11	2	19
31.6%	57.9%	10.5%	100%

Table 3

Question:					
How long does it take to approve or reject a development/rezoning application, in particular, in respect of contaminated/potentially contaminated land?					
No. of Councils	(%)	Development application (DA)	Rezoning application (RZ)	Contaminated land DA & RZ	No answer
11	58	✓ 2 – 6 months	✓ 2 – 8 months	✗	✗
4	21	✗	✗	✓ No set time, depending on complexity of the contamination	✗
4	21	✗	✗	✗	✓
Total 19	100				

Note: ✗= no response

The survey shows that there is contamination land in 90% of the surveyed council areas. The majority of the councils do not treat contaminated or potentially contaminated land differently. The normal time-frame for approving development and rezoning applications are 2 – 6 months and 2 – 8 months respectively. In relation to contaminated land, there is no set time-frame for processing the application. This adds extra uncertainty to any redevelopment proposal.

Any development approval, if subsequently granted, will be conditional on having the site cleaned up before the commencement of any actual redevelopment works. Therefore, the overall lead-time before the actual commencement of redevelopment work on the site is much longer than a clean site. The extra time and costs involved have a substantial impact on the value of contaminated land.

The remedial work to the Ampol Refinery site at Matraville, NSW, is a good example to demonstrate the time taken for cleaning up a contaminated site. The site was used for the production, storage and distribution of petroleum products for 36 years and operation was ceased in 1984. The owner intended to have alternative use on the site and a site assessment exercise was carried out in October 1988. The State Pollution Control Commission (predecessor of the current Environmental Protection Authority) issued a clean up notice in August 1989 and soil remedial work started in July 1990. It took 6 years from site assessment to completion of the remedial work. The site was finally cleaned to standards that make it suitable for general industrial use under zoned 4A of the relevant land environment plan. (Maslen, 1994).

3.4 Why contaminated land has a lower value?

Time is both money and opportunity. The lengthy process in getting development approval and clean up of the site, coupled with the high cost involved, have a significant impact on the value of contaminated land. In general, the development value of clean land is assessed using the hypothetical method as follows:

$$V = E - C_d - P$$

where

V = land value

E = expected completion value of project

C_d = development cost (including finance cost)

P = developer's profit & risk cover

In comparison, the value of contaminated land is often lower than that of clean land. Consider that the completion value, developer's profit and risk cover, and development cost remain unchanged. The land value is assessed as follows:

$$V = E - (C_e + C_l + C_c + C_o) - C_d - P$$

where

V = land value

E = expected completion value of project

C_e = cost of EIA

C_l = legal cost in case of dispute

C_c = clean up & long term monitoring cost

- C_o = loss of opportunity cost during development application and clean up period
- C_d = development cost (including finance cost)
- P = developer's profit & risk cover

Since the number of cost items has increased in this case, it is inevitable that the residual land value is a lower figure, not to mention that in real life the developer will require a higher profit and risk factor to cover the extra risk.

The extra time and costs, and hence the overall investment risk, are directly proportional to the complexity of the contamination. The value of a contaminated site, on the other hand, is inversely proportional to the complexity of the contamination. The relationships can be shown in Figure 1 below:

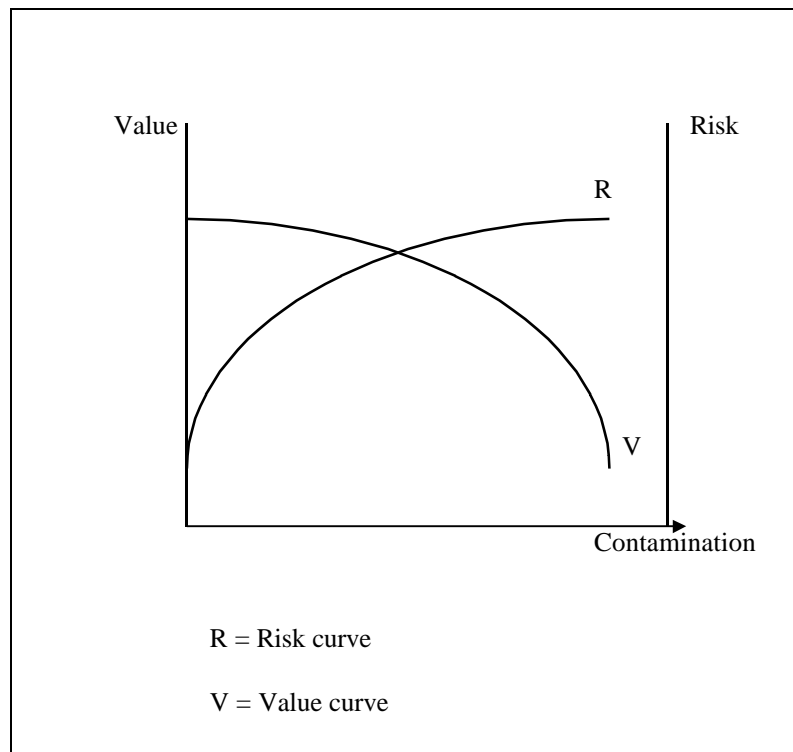


Figure 1 Variation of Land Value and Risk

The degree of contamination, in the extreme case, may be beyond the capability of current remediation techniques, or the cost may exceed the benefit. If this happens, any redevelopment proposal will have to be shelved.

3.5 The positive role of environmental planning

One of the objectives of environmental planning is to ensure a decent environment for people to live and work in. Accordingly there is an implied goal to reduce the number of contaminated land in the community and put the land to beneficial use. On the other hand, there is also a social obligation on landowners to clean up contaminated sites. However, due to the lack of finance or the absence of incentives, many contaminated sites are left idle or abandoned. While the EPA may require clean up of the sites by enforcing the relevant environmental laws, landowners or other responsible persons may not be willing to carry out the necessary remediation because of the high cost involved, and challenge the clean up order through lengthy litigation. Moreover, there is no guarantee that the land will be used to benefit of the community afterwards. A better approach is to exercise environmental planning to achieve the goal.

Where the redevelopment of contaminated land is supported by other factors such as location and market demand, the planning authority may plan the beneficial uses of the land and accordingly rezone it to higher value uses, such as commercial or residential, to encourage the redevelopment. Coupled with economic forces, the rezoning effectively adds value to the sites and increases their redevelopment potential. If the redevelopment goes ahead, the site will be cleaned up and the end use is acceptable to the community.

To the motivated developers, the extra risk of redeveloping a contaminated site still exists. Though the risk cannot be completely removed, it may be reduced if the redevelopment time frame can be shortened. A proven method is to have prior consultations with the consent authority and communications with neighbourhood groups. Frank discussions and consultations can reduce suspicion and distrust, after all it is to the benefit of the community to have the sites cleaned up and put to alternative uses.

For example, in the proposed redevelopment of the former Cabarita ICI Dulux paint factory site, the local council and community were informed of the existing degree of contamination on site and that the remediation would make the site 'cleaner than clean' (i.e. cleaner than background level). The effective communications and consultations reduced resistance to the redevelopment proposal to a minimum, and the redevelopment application was processed with fewer holdings (Payne, 1997).

4. Adequacy of Environmental Planning on Contaminated Land

Each of the States has its own approach to exercise environmental planning control of land contamination. On the whole the approaches are very similar and can be grouped as follows:

- a) using land use zoning control to safe guard sensitive uses such as residential, commercial, educational, etc. from environmentally unfriendly land use and development activities;
- b) using planning consent requirement to control and prevent unauthorised use and development of land;

- c) requiring the submission of an environmental impact statement for specified category of land uses and developments.
- d) allowing public participation in planning scheme preparations and planning consent applications.

In Australia, local councils are the primary authority to exercise environmental planning control of land contamination. They are also the front line to receive public views about land contamination and development of contaminated land. Therefore it is expedient to carry out a survey of the councils' opinion to find out if the current environmental planning approaches are adequate for the control of land contamination.

The Sydney metropolitan area is chosen for a case study. A survey (referred to in section 3.3 above) was conducted in September 1996. Questionnaires were sent to forty (40) local councils within the Sydney metropolitan area. Nineteen (19) local councils responded to the survey. Subsequently the planning officer of three (3) separate local councils was interviewed to verify the views expressed in their reply. The responses to the questions are summarised in Table 4 below:

Table 4

Questions	Yes	No	Don't know	Total
Are the existing EIA requirements adequate to control of land contamination?	53%	32%	15%	100%
Is the power under the existing environmental planning laws adequate to control land contamination?	47%	37%	16%	100%
Is there sufficient public participation in environmental planning control of land contamination?	95%	5%	0%	100%
Is the council's performance in reducing/ controlling land contamination satisfactory?	74%	5%	21%	100%

The survey shows that over 50% of the respondents consider the existing EIA requirement adequate. Thirty-two percent (32%) of the respondents consider it inadequate. Their discontents are based on various reasons including that an environmental audit is not part of the compliance requirements of an EIA, a separate contamination report is not submitted to the council, and an on-going site-monitoring requirement is not incorporated in the EIA, etc.

Less than 50% of the respondents are satisfied with the power under the current environmental planning laws. Thirty-seven percent (37%) of the respondents consider it inadequate. The pitfalls of the current environmental planning system highlighted in the responses include the lack of power to require environmental audits, the lack of power to pro-actively require assessment or clean-up of contaminated sites, clarification of council's obligations in relation to identification and notification of potential land contamination, etc.

Regarding public participation in the prevention and controlling of land contamination, nearly all councils consider the existing provisions in the environmental planning law adequate. Also, the majority of the respondents are satisfied with council's performance in the prevention and controlling of land contamination.

From the above analysis, it appears that the current environmental planning control is far from adequate. Generally the councils are not satisfied with the current EIA requirements and their power under the current environmental planning. They want to have power to require environmental audit and that on-going site monitoring be part of the requirements of the EIA. In addition they want a separate contamination report be submitted to them. To better deal with contaminated sites, they demand power to carry out pro-active assessment and order clean up of contaminated sites. They also want to clarify their obligations in relation to identification and notification of potential land contamination.

It should be noted that the survey result is indicative only in view of the limited response to the survey. Furthermore, there are known contaminated sites in some council areas, such as the Sutherland Shire, but the relevant council failed to respond to the survey. Accordingly the survey result may not be representative across the board.

5. Strengths and Weaknesses of existing Environmental Planning Control

The current environmental planning system is a big leap from the old planning systems. Apart from maintaining land use control and strategic planning, the system recognises the need to conserve the environment, both cultural and natural, and incorporates procedures to achieve the goal. The new system has been in force since the late 1970s and there is sufficient length of time to test its strengths and weaknesses. In general the system has the following strengths:

a) Originated from established planning systems

The current system has evolved from the traditional land use planning and town and country planning systems. As the change is gradual, the learning curve is less steep, making it easier for the public to cope with new measures introduced under the new system.

b) Local councils as the principal consent authorities

At present the Commonwealth government has virtually no role to play in respect of environmental planning at state, regional or local levels. The day to day environmental planning control at local level is left to local councils. Being at local level, the councils are aware of actual local needs. They are the best bodies to consider the balance between economic development and environmental protection within their jurisdiction.

To balance the interest of individual local councils and to control and guide their planning activities, all local environmental plans have to be approved by the Minister responsible for environmental planning in the State. Besides, he/she has the power to prepare planning guidelines/policies which bind the local councils, and has call-in power under the environmental planning law

c) Public participation

The current system has a high degree of transparency. The public is notified about any draft planning schemes, amendment to planning schemes and land use/development applications. The public has the chance to put forward their view by way of submissions or objections to the applications and proposals. Some environmental planning provisions, such as s. 123 of the EPAA, even allows any member of the public to bring proceedings in the Court for an order to remedy or restrain a breach of the relevant planning law (Davis & McRae, 1992).

d) Release of land information

The planning certificate helps the public to know more about a piece of land. Although not every state provides for the inclusion of contaminated land as part of the information in a planning certificate, the prescribed information provided is still very valuable to an interested person to help him make investment, development, or occupation decision.

e) Land Use Zoning

It specifies permitted uses for defined areas of land. By doing so, it can separate problematic land uses from other land uses. It also shows landowners, developers and occupiers the permitted use of the land. Apart from minimising uncertainty for land use and development, it is a necessary means of internalising for a community the potential external costs that might flow from unregulated private development of land (Ramsay & Rowe, et al, 1995). By rezoning contaminated land for alternative uses, it helps recycling what was derelict land for beneficial uses, eliminating eyesores and enhancing the environment.

f) EIA requirement

The EIA requirement is an important weapon to protect the natural environment. It helps the consent authority making decision in respect of an application for use and development of land. The requirement is imposed when the proposed activity is a designated development or that it will potentially cause land contamination.

Although the requirement may delay a development, it does not involve a heavy financial burden to the applicant. Garner and O’Riordan (1982, cited in Leeson, et al, 1994, p. 74) point out that “the finance cost of preparing an [EIA] is rarely more than 0.6 per cent of the final development costs”. Even if the cost is higher, it is still a small cost in relation to the protection of the environment.

The environmental planning system is a significant progress in the planning history, but it is not perfect. Despite the above strengths, it also has the following weaknesses:

a) More resources required

The environmental planning system requires local councils to look at environmental implications brought about by developments and redevelopments. Its proper implementation requires extra time, expertise, administrative works and other expenses. This puts considerable pressure on the already tight resources. The revenue from relevant application fees cannot match the processing costs. Since extra funding from the State government is not always available, it puts the local councils in a difficult position to provide quality service to the public.

To serve the public better, the councils should have the resources to carry out voluntary investigation of contaminated sites and keep a register of the sites. Also planners should be funded to have more research of land contamination issues. The lack of resources makes it impossible to achieve the objectives.

b) Lack of expertise

Planning officers of local councils are planning experts, but very few of them are also experts in environmental matters. They do not have the required knowledge in biology, chemistry and engineering to deal with land contamination matters. Very often a planning officer may find it difficult to comprehend the contents of an EIA report.

To solve this problem, local councils require assistance from the EPA or hiring their own environmental consultants. The latter case means extra costs to the councils. Regarding delay caused in the referral process, it can be minimised by good management. The developers can also help if they can submit all necessary information to assist the councils to make decision.

c) Land information

Under the current planning system, the public is entitled to obtain land information from the local council. Different states have different approaches to release land information. In some states, the amount of information released depends on the type of certificate applied for. For example, there are two planning certificates in NSW under s. 149 of the EPAA and three certificates in Queensland under s. 3.3 of the LGPEA. Besides having trouble in figuring out which certificate to ask for, the public has to pay more for a certificate that contains more information. As people tend to minimise the cost, they generally will choose a cheaper certificate

and may miss the information that they wanted.

At the moment, apart from NSW, land contamination is not part of the prescribed information in the certificate. This limits the usefulness of the certificate. Furthermore there is no requirement that the local councils should keep a contaminated land register. This makes it difficult for the council officers as well as the public to verify if a particular site is contaminated.

d) Land use zoning

While land use zoning has the benefits mentioned above, it also brings about unwanted results. For example, industrial zoning pools industrial activities to a specified location. Very often it also means pollution and other hazard are brought to the area. In case of an accident, workers and residents nearby are in danger. For example, the toxic chemical storage at Coode Island near Melbourne was on fire on 21 and 22 August 1991, evacuation of workers and residents nearby were necessary (Baird, 1992). The latest news about this chemical depot is that the Victorian government has decided that it is going to stay on its current site. It follows that workers and residents nearby have to live with this toxic time bomb.

Likewise the planning and development of roads also enable contaminants to be brought to areas which were too remote or difficult to reach before.

e) EIA pitfalls

Under the current system, the applicant needs to submit an EIA document to the council for consideration. As the applicant pays for the document, there is concern that the contents of the document may be biased in favour of the applicant. Besides the data are kept secret, the public has no way to participate in the process. Furthermore the current EIA requirements do not provide for post decision monitoring of the project/development.

Furthermore, the current planning system features 'performance standards' approach. A development will be approved if the developer can prove that the proposal meets set down criteria. As long as the EIA document is prepared in accordance with the prescribed framework and that the remediation is to be carried out to the ANZECC standards, the application will be approved. This approach suffers from the deficiencies that criteria and standards have to be set and that they may not be acceptable in the future.

6. Conclusion

Environmental planning is an extension of the traditional town planning. In Australia, it took about 70 years before the current planning system comes into being. It features more emphasis on the conservation, preservation and protection of the environment with a view to achieve ecologically sustainable development. Land use control under environmental planning, together with other factors, determines the highest and best use value of a site.

The value of contaminated land is definitely affected by environmental planning control.

The time required to obtain the approval and subsequent clean up of the site can be very long. The overall longer time frame adds extra risk to redevelopment projects. Since time is both money and opportunity, a redevelopment proposal may fall through causing substantial loss to the developer. But this is inevitable as environmental planning is aimed at protecting the interest of the public rather than the interest of individual landowner/developer.

Environmental planning, apart from controlling uses that may cause land contamination, also helps eliminating contaminated land. Through proper land use zoning and rezoning, it encourages clean up and recycling of contaminated sites for alternative uses. The exercise of environmental planning control is a better approach to encourage redevelopment of brownfield sites. What was formally an eyesore to the community may become a jewel in the neighbourhood.

The weaknesses highlighted in the last section show that the current environmental planning control on contaminated land is barely adequate. Measures to address the pitfalls should be introduced. Regarding the weaknesses due to the current 'performance standard' approach, other countries, such as New Zealand, adopt a different approach known as 'effects (or merit) based' approach (Cardew, 1997). Under this approach, the developer has to demonstrate that the development will not cause significant impact on the environment. Although this will impose a higher hurdle to the developers, it removes the need to set compliance criteria and standards. Future legal dispute and legal liabilities to the authority can be reduced. Given that land contamination is a sensitive environmental issue, this new approach may give the public more protection. Australia may consider borrowing this planning concept. To address all the problems, it is necessary to have an overhaul to the planning system and to review the financial support to the councils.

References

Alexander, I., 1982. *Post-war Metropolitan Planning*, in Troy, P. (ed). *Equity in the City*. Allen & Unwin, Sydney. Pp. 147 - 151.

Appraisal Institute. 1992. *The Appraisal Of Real Estate*. 10th edition.

Baird, M., 1992. "Coode Island And Contaminated Sites". *Australian Planner*. Vol. 30. No. 4. p.215-220.

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

Cardew, R., Director of Graduate School of Environment, Macquarie University, Interview, October 1997.

Compton's Interactive Encyclopedia. 1994.

Commonwealth Department of Housing And Regional Development. 1995. *Better Cities National Status Report 1995*.

Davis, F. & McRae, E., 1992. *Town Planning For Real Estate Agents And Valuers*. Lynfran Publications.

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

Department of Urban Affairs and Planning & the NSW Environment Protection Authority. October 1995. *Planning Guidelines For Contamination Land*.

Farrier, D., 1993. *Environmental Law Handbook Planning And Land Use in New South Wales*. Redfern Legal Centre Publishing.

Fowler, R.J., 1996. "Environmental Impact Assessment: What Role for the Commonwealth? -- An Overview". *Environmental and Planning Law Journal*. p.246-259.

Freestone, R., 1992. "Sydney's Green Belt 1945 - 1960". *Australian Planner*. p.70.

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

Gifford, D.J. & Gifford, K.H., 1987. *Town Planning Law and Practice*. The Law Book Company Limited.

Gunther, C. & Churchill, B., 1990. *Real Estate Why Is It So?* 7th edition. Bricar Publishing.

Harvey, N., 1994. "Timing Of Environmental Impact Assessment". *Australian Planner*. Vol. 31, No. 3. p. 125 – 130.

Hollick, M., 1986. "Environmental Impact Assessment: An International Evaluation". *Environmental Management*. Vol. 10, No. 2, pp. 157 - 178.

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

Leeson, R., 1994. "EIA and the Politics of Avoidance". *Environmental and Planning Law Journal*. p.71-92

Logan, W.S., 1984. *Urban and Regional Planning in a Federal System: NSW and Victoria*, in Bunker, R. and Hamnett, S. (eds). *Urban Australia: Planning Issues and Policies*. Nelson/Wadsworth. Melbourne. Ch 3.

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

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

Payne, J., Corporate Property Manager, Dulux Australia, Interview, February 1997.

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

Ratcliffe, J. & Stubbs, M., 1996. *Urban Planning and Real Estate Development*. UCL Press.

Royal Australian Planning Institute. October 1995, *Planning And Environment Policy Statement*.

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

Victoria Environment Protection Authority. February 1997. *Prevention And Management Of Contamination Of Land*. Issues Paper. Publication 527.

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.

Winston, D. 1957. *Sydney's Great Experience*. Angus and Robertson, Sydney, Ch 3:25-37.

Environmental planning is the process of facilitating decision making to carry out land development with the consideration given to the natural environment, social, political, economic and governance factors and provides a holistic framework to achieve sustainable outcomes. A major goal of environmental planning is to create sustainable communities, which aim to conserve and protect undeveloped land. Land cover and land use patterns on Earth reflect the interaction of human activities and the natural environment [1]. Human population growth together with competitive land use causes land scarcity, conversion of wild lands to agriculture and other uses. As we can see, the anthropogenic factor has an important impact on land use and land cover changes. Economic factors define a range of variables that have a direct impact on the decision making by land managers. Technology can affect labor market and operational processes on land. Demographic factors, such as increase and decrease of population, and migration patterns have a large impact on land use. economic impacts of landfills. An attention has been given to the available modeling. protected cells on the land surface or in excavations into the land surface. Within the landfill, biological, chemical and physical processes occur and they promote the degradation of wastes. Assessing the impact of landfills on residential property values is an. example [4, 5, 38]. 4 environmental impact of landfills. The land, when contaminated with toxic chemicals and pesticides, lead to potentially fatal problems like skin cancer and the human respiratory ailments in particular. Globally, 9,500 people are diagnosed with skin cancer every day. The toxic chemicals can reach our body through foods and vegetables that we eat as they are grown in polluted soil. Land pollution also caused developmental deficiency in children. By simply switching to a reusable cloth bag for groceries instead of plastic shopping bags will help cut down on the need for non-biodegradable materials. 5. Avoid buying packaged items as they will lead to creating garbage and end up in the landfill site. 6. Ensure that you do not litter on the ground and do proper disposal of garbage. 7. Buy biodegradable products. While recognizing inevitable impact on the environment, the Company by approving this Policy assumes an obligation to minimize its impact, taking into account the consequences of its operations and compensating for the inflicted damage. 4. Objectives. Applying the principles of environmental design for planning new and reconstruction of the existing facilities. 6.3.5. Business operations in territories and waters of high conservation value are only permitted in exceptional cases by special resolution of public authorities. 6.4. Responsibility for the environmental consequences of its operations: Consideration of environmental risks and possible environmental consequences at the design and strategic planning stages.