Valuations Involving Brownfield Sites – an Economic, Environmental and Social Issue

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SUMMARY

For many years, this team (Commission 9, Working Group 9.2) has been investigating and presented international research papers on the complex issues involving contaminated sites. This paper will be a combination of these finds and also cover envisaged future challenges.

The significant reason for this issue in Western world governments and private sector businesses have recognised the importance of "re-found[1]" brownfield[2] land from an Economic, Environmental and Social issue (triple bottom line). Land that had previously been contaminated and rendered unusable as a result of its past use is being "re-found" via a forensic process and thus made useful again. The consideration of alternative uses and valuation methodology is paramount in establishing the value of such a site.

The need to encourage the land professional's awareness worldwide, to consider the practice of valuations of contaminated sites to achieve Economic, Environmental and Social Issues has been driven by three key factors:

- Land shortages, particularly in urban/commercial areas, (equating to higher prices);
- The need to rectify environmental catastrophes which have occurred over time, usually via the movement of contaminated ground water resulting in the contamination of clean land; and;
- To remove visually unattractive evidence of past uses such as former rubbish tips.

The experience of Valuer-General Victoria provides a case study of a sophisticated forensic valuation[3]/appraisal approach to the valuation of contaminated land which has facilitated triple bottom line development to take place. Furthermore, by using this process, risk is reduced via the increased use of specialists in various fields of site investigation.

[1] Re-Found: used for a specific purpose but had previously been used for a totally different, and now obsolete, purpose. A new use is thus "re-found". For example, a former wharf/docklands area being converted to residential housing. A coffee cart being incorporated into a building foyer.
[2] Brownfield: Land that has been contaminated or affected by chemicals.
[3] Forensic Valuation: Incorporates a scientific and quantifiable aspect to the valuation process.

The future 'hot' matter in contamination is ground water and the protection of aquatic ecosystems, potable (drinking) water, primary contact recreation, agriculture and industrial water supplies that is becoming so important to many communities worldwide. This future challenging matter of ground water and related consequences will also be addressed.

1. BACKGROUND

This paper reviews some work by FIG Commission 9 Working Group 9.2 over the last four years focusing on the environment relating to contaminated "re-found" brownfield land from an economical, environment and social view with many western countries' governments and private companies recognising the importance of dealing with this now in many cases solvable problem. The real challenge has been to try to raise awareness by sighting real examples using different way to sell this message that there are new solutions evolving at this time. Land professionals like Surveyors and Valuers are well placed to identify problem areas and working with environmental specialists to target these areas and develop cost effective solutions that can be implemented and then shared with others working with land owners or leaseholders who have a interest in these lands.

2. ACTIONS TAKEN BY WORKING GROUP 9.4

2.1. The FIG website

Prior to the FIG Paris, France 2003 working week an area on the FIG website for Commission 9 was made available to be used to site interesting brownfield success projects. At the Paris working week a detailed paper titled *'Addressing Environmental Issues in Valuation/Appraisal Assessments'* was present describing these projects and advertising the website to raise awareness highlight technological advancements and the use of the environmental audit process. It was envisaged that web based Google searches may then target this area which would be regularly updated. This goal was not achieved so a changed strategy was adopted. The new strategy was to present a series of different papers on this subject to delegates at as many FIG forums as possible up until FIG Munich, Germany October 2006 to assess the impact within FIG.

2.2. Papers presented at World forums

The FIG Athens Greece 2004 working week paper was titled *'The Necessity for 'Re-found' Brownfield Land and Preventing Environmental Catastrophes – A forensic Valuation /appraisal Approach to Contaminated Land'*. This paper provided a case study of a site, which had substantial environmental issues and was functional obsolete and visually unattractive for many years. Also the concept of 'Insurance Coverage' to protect parties for the related costs associated with site clean-up was introduced.

At the 3rd Regional Conference Jakarta, Indonesia in October 2004 the paper was titled *'The Importance of Considering Alternative Uses and Methodology when Valuing/Appraising Contaminated Sites'*. The example with this paper was 'a combination of costs specific to the site and the value of the identified alternative use (costs and land use matrix) will determine the highest overall assessment for this contaminated brownfield land'.

For the FIG Cairo Egypt April 2005 working week the paper was titled *'Addressing Heritage and Contamination Environmental Issues in Valuation Appraisal Assessments'* introduced the concept that protection of Heritage could also be factored it. Protecting heritage structures with materials considered to be contaminated posed a conflict between two desirable outcomes.

This year the paper presented during the 5th FIG Regional Conference Accra Ghana, March 2006 titled *'Land Administration of Contaminated Sites – Considering Alternative Uses.'* Also introduced was the current "Hot Issue" of ground water contamination which is examined further in this paper. This presentation attracted over 100 delegates, the largest group to attend a FIG Commission 9 paper so we believe that publishing of a series of environmental related papers has had the success we were hoping to achieve.

3. GROUND WATER

This FIG conference theme is 'Shaping the Change' fits with one of the themes of this paper which focus on an emerging issue of unusable water and the links to contaminated land that valuers are more than ever needing to consider as part of a property valuation . In the past a number of land uses have environmentally damaged this land and any water that later crossed it or seeped through it may have an ongoing impact on the whole water ecological system. A current example would be the proposal for the Queensland Government of Australia to build a dam on the Mary River Valley in southeast Queensland facing serious opposition. A local person reportedly remembers pouring a five-gallon (32-litre) tin of arsenic into the cattle dip on his family property in this proposed dam site. "Arsenic never dies" so research on land use that may reveal these historical messages need to be listening for when surveying or valuing land. These environmental surprises need to be identified as soon as possible and a remediation strategy put in place to avoid future contamination and litigation.

In previous papers some innovative ways of restoring these "re-found" brownfield lands to some productive or passive use have been described. We as land professionals in Australia and other countries are seeing the ongoing impact this environmental damage will leave for future generations if, when identified, action is not taken. Land professionals have a professional responsibility to inform current land owners and users of any damage when it is identified. Creative solutions are available and these need to be shared with these land users. The good news is that some large international corporations which in the past were perhaps putting profit in front of environmentally clean production and products are now taking steps to mitigate past environment damage and rectify contaminated land.

A recent paper by-line stated 'Water inertia comes at a price'. Over many years the water rights available to many rural properties have been over generous and led to inefficient use of the land. This has lead to water wastage of up to 77% (one estimate) from capture/extraction to final use. This technical and allocation inefficiency in a dry continent like Australia is now better understood. Surveying in new pipelines leading to tank storage will limit evaporation and increase, saleability of water rights to allow those who value them to set the new water price, which may change the way valuers assess some rural land. The maintainable ongoing water quality minimum acceptable/adequate environmental flows need to be established with consideration for the impact of salt damage in irrigation areas and the new mitigation methods to manage the impact salt can have if allowed to accumulate. Better monitoring of water run-off to detect hidden surprises like the arsenic example above may enhance a property's value. The risk of possible future litigation if one of these 'hot spots' was identified as the source of significant water pollution could also be detected. Victoria is seeing a land use move from pasture grazing to a more profitable enterprise such as horticulture where water quality and regular supply will become an important link to the property value.

3.1. Groundwater Beneficial Use

The protected beneficial uses of groundwater in Victoria, Australia are outlined in the State Environment Protection Policy (SEPP) Groundwater of Victoria (Reference 10) (Groundwater SEPP). The Groundwater SEPP classifies groundwater into five segments on the basis of background salinity (TDS) levels. Each segment has defined beneficial uses for protection.

The total dissolved solids (TDS) concentration of the groundwater across the site has been found to range from 230mg/L (in well GWA) to 1,900mg/L in well 101012. These measured TDS values would classify the site groundwater as Segment A1 and Segment B. The potential protected beneficial uses for Segment A1 groundwater (as stated in the Groundwater SEPP) are as follows:

- Maintenance of ecosystems;
- Potable water supply;
- Agricultural parks and gardens (irrigation);
- Stock watering;
- Industrial water use;
- Primary contact recreation (e.g. bathing, swimming); and
- Buildings and structures.

The SEPP specifies that the listed beneficial uses for groundwater must be protected and so initial assessment of groundwater impact must take into account all of these uses. Similar standards are found through many parts of the World and are being developed in many Countries.

3.2. Groundwater Assessment Criteria

The Groundwater SEPP cites references in which objectives (criteria) are nominated for particular protected beneficial uses. These groundwater criteria can be divided into those associated with Maintenance of Ecosystems which are relevant at the point of discharge of the groundwater to a surface waterbody and those uses grouped as Groundwater Extractive Use which are relevant at the point the groundwater is extracted from the aquifer. This could be on or off the site

3.2.1. Protection of Aquatic Ecosystems:

The Groundwater SEPP stipulates the indicators and objectives for protection of aquatic ecosystems are those specified in the SEPP Waters of Victoria. The nearest surface waterbody to the site is the Maribyrnong River. However, groundwater has been found to flow away from the River towards a deep sewer in Whitehall Street. Therefore, for this site the relevant criteria under the SEPP Waters of Victoria are inferred to be the freshwater criteria of the Australian and New Zealand Guidelines for Fresh and Marine Waters (2000) (Reference 11) (the AWQ 2000 Guidelines).

3.2.2. Protection of Potable (Drinking) Water:

The Groundwater SEPP specifies that criteria for raw water for drinking water supply are those specified in the Australia Water Quality Guidelines for Fresh and Marine Waters 1992 (Reference 12) (AWQG 1992). In addition, groundwater shall not be affected such that it is tainted.

3.2.3. Protection of Primary Contact Recreation:

The Groundwater SEPP specifies that direct interaction with groundwater in trenches and swimming pools or contact with groundwater that has discharged into nearby surface waters shall meet the AWQG 1992 Recreational Water Guidelines. These guidelines refer to the AWQ 1992 criteris for raw water for drinking purposes for toxicants. It is stated that in AWQG 1992 that *"higher concentration of toxicants may be tolerated occasionally if it is assumed that a person will ingest a maximum of 100ml water during a normal swimming session… compared with 2 L/d for potable water"*. Golder Associates experience is that this equates to an increase in the AWG drinking water criteria of approximately 10 to 20 fold, depending on the contaminant, taking other pathways into account. Where specific criteria were not available in the AWQG, criteria for tap water were sourced from USEPA Region III.

3.2.4. Protection of Agricultural Water Supply for Stock Watering:

The Groundwater SEPP references the AWQG 1992 for livestock water.

3.2.5. Protection of Industrial Water Supplies and Buildings and Structures:

In general, the criteria adopted above are protective of these beneficial uses for the purposes of groundwater screening.

3.3. Groundwater Monitoring

In many cases it is recommended that further monitoring after subject site has been decontaminated or contamination encapsulated for five or ten years in order to demonstrate management of known site conditions.

Samples should be taken above and below the ground water flow line via bores drilled to a depth of the groundwater floor. Such samples should be taken approximately four times per year as the seasons change.

The purpose of this monitoring is to establish if the subject site is "adding to or affecting" the quality of the groundwater.

4. CONCLUSION

Pro-active research along with good land administration of land and identified contaminated sites can be beneficial. An approach to achieving a desirable outcome and shaping change is possible by testing at land uses, allocation.

Knowledge and the professional skill of land professionals and the land owner or manager can enable the changing shape of the world to be enhanced.

The challenge in 2002 in Washington DC by the outgoing Chairman of FIG Commission 9 Michael Yovino-Young to raise the awareness on positive outcomes on Brownfield sites has been achieved. The ongoing challenge to FIG is to keep this going in new innovative ways.

*This paper represents yet another significant step forward in the long road for **rectification and respect of the environment**. Chairman of Commission 9, 1998-2002, has raised the awareness of the issue over a number of years, and now this paper provides a further foundation to this important matter. Simon this is what we said in Paris so you may wish to play with these 2 options.*

DISCLAIMER

We would like to draw to your attention to the fact that the views presented in this paper are our own; and should not be construed as representing those of the State Government of Victoria, Australia.

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BIOGRAPHICAL NOTES

I Simon Adock have a wide range of valuation experience on major commercial valuation sites, major office buildings, residential development sites and specialist properties, some of which have values in excess of AU$1 billion. Currently I am involved in valuation issues involving the redevelopment of Melbourne Docklands into a residential/mixed use precinct and the 2006 Commonwealth Games venue.

For a number of years I have presented international conference papers at FIG, these include Buenos Aires- South America, Durban - South Africa, Brighton – United Kingdom, Seoul –

South Korea, Washington DC – United States, Paris – France and Athens - Greece. I also presented papers at 46th IFHP World Congress held in Tianjin – China.

I am a member of both the Australian Property Institute (Victorian Division) and Victorian Division of Institution of Surveyors Australia Inc. In addition, I also Chair Working Group 9.2, Commission 9, and Chair Elect for Commission 8, FIG.

I enjoy substantial support from the Victorian Government to promote the benefits of FIG at these forums.

I Ed Young have a wide range of experience since becoming a licensed surveyor in 1966 in many aspects of surveying, land development and property management in Australia, Papua New Guinea, Canada and Malaysia along with a period in late nineties working for the development of geospatial information in Victoria. My work as a Property Manager in the Victorian power industry highlighted for me the scale and variety of environmentally damaged sites and introduced me to a group of professionals dedicated to remediation of these sites. Currently I consult.

I have presented papers in Singapore, Papua New Guinea and France.

I am a member of Victorian Division of The Institution of Surveyors Australia Inc. (ISA) and an ISA councillor. In addition I have been with FIG Working Group 9.2 since 2002.

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