# Draft Report on the Proposed Armidale Regional Landfill Proposal

## 1.0 Scope

This Report contains commentary and analysis on the Environmental Assessment dated April 2010 and the Submissions Reports, dated October 2010 and April 2011 undertaken by AECOM on behalf of Armidale Dumaresq Council (ADC). The information from the aforementioned documents was supplemented by a site visit on 22 December 2010 and various meetings with the Department of Planning representatives in Sydney.

The author was engaged primarily to give expert advice to the Department of Planning on the waste management related aspects of the proposal. The scope of this report, therefore relates to:

- The Waste Strategy underpinning the Project
- The need and justification of the Project
- The alternatives considered
- Social and Economic Factors
- State Environmental Planning Policy (Infrastructure) Amendment (Landfills) 2010

## 2.0 Report Author

Greg Freeman is the Managing Director of Impact Environmental Consulting Pty Ltd, (IEC) a business he established in 1996. Prior to establishing IEC, Greg worked in Local Government for 11 years in both metropolitan and regional NSW Councils. Greg has a Masters in Environmental Health and a Masters of Social Ecology.

IEC is an environmental consulting company, based in Port Macquarie, NSW.. They carry out a wide range of consultancy projects that include strategy development, business cases, tendering and contract development for all facets of waste collection, processing and disposal.

Greg has worked with numerous regional Councils (recent ones include Broken Hill, Alice Springs, Shoalhaven, Wentworth) and therefore understands the social, economic and environmental issues they face. Greg recently assisted the NSW Planning Assessment Commission in the determination of the Orange Regional Landfill Project.

The opinions expressed in this report are those of the author.

## 3.0 Waste Strategy

The NSW Government adopted waste diversion targets in the Waste Avoidance and Resource Recovery Strategy of 2007. This Strategy sets the following targets for reduction in waste to landfill, based on Year 2000 starting point:

- Municipal (MSW) 66% by 2014
- Commercial and Industrial (C&I) 63% by 2014
- Construction and Demolition (C&D) 76% by 2014

ADC states a combined performance of 60.6% for MSW and C&D in the 2009/10 year.(p17 Submissions 2010)

The most recent Waste Management Strategy from ADC is dated 2010 and was adopted by Council in late 2010. It is a four page document that focuses mainly on the infrastructure and services that exist and are proposed for ADC, particularly the new landfill that is the subject of the EA. A copy is also located in the Appendices of the Submissions Report (April 2011)

The ADC Waste Strategy 2010 does not address the issue of how waste will be minimised, how the NSW Targets reached or how the community will be engaged and educated to play their role in the success of a new system in ADC.

The ADC Waste Strategy (2010) focuses on three main waste recovery approaches:

a) The collection and processing of food and garden organics (established prior to the new landfill)
b) The collection and stabilisation of residual MSW (established prior to the new landfill)
c) The development of a Commercial and Industrial MRF.

These actions are commendable, but some sense of priority should be given to what is achievable in the short time period before the new landfill is due to open. The action a) above would appear easier and more cost effective to achieve (as there is an existing garden organics service) and would have a flow on effect of reducing organic matter in the MSW stream.

The Waste Strategy is very short on detail and proposes establishing significant infrastructure in a short timeframe that will be costly and may not achieve the desired objectives. In the author's opinion, an initial focus on the food and garden capture and treatment from the residential and C&I sectors would be more appropriate in terms of resource recovery. This initial focus should be a short term priority rather than trying to do both the MSW stabilising and food and garden capture at once.

It is also clear from supporting Council documentation in the Submissions Report (April 2011) that ,as late as December 2010, ADC was supportive of serious consideration of Alternate Waste Technology AWT and that the new landfill should be receiving mainly non-putrescible material. Again this strategic move towards the new landfill being non-putrescible is a worthy one, but the rush to an AWT technology is an expensive endeavour, when the collection and treatment of food and garden could have a more significant impact on the organics in the MSW at possibly lower costs and improved community involvement.

ADC have not clearly articulated the diverse range of current activities underway or the future strategic priorities in a single Waste Management Strategy. This will need to be done so the community and the Council can understand how all the activities and programs relate to each other. This landfill project should not be seen in isolation, rather it should be viewed as part of an overall plan to responsibly collect, process, recover and dispose of the community's wastes.

## 4.0 State Environmental Planning Policy – Clause 123 Amendments

From a strategic waste management perspective, these amendments, introduced in July 2010, were a significant attempt to improve resource recovery and to reduce the environmental impacts of landfilling.

For this ADC Project the proponent was required to demonstrate justifiable demand for the landfill and:

1. Take into account waste minimisation objectives
2. Adopt best practice landfill design and operation
3. Consider the Location of the landfill (on degraded land and avoid land use conflicts);

4. Optimise transport links so as to reduce social and environmental conflicts associated with waste transportation to the landfill.

In the Submissions Report, dated April 2011, the Proponent responded to the above issues in respect to this Project.

### *4.1 Waste Minimisation Objectives*

ADC states that they are achieving a combined 60.6% diversion in the Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) Waste Streams in the 2009/10 year. (p15 Submissions Report, 2010) The NSW Target is a 66% reduction for Domestic Waste and 63% reduction in C&I waste by 2014.

Without figures for each of the MSW and C&I waste streams it is difficult to predict how ADC is progressing in relation to these State wide targets.

The current collection system for MSW at ADC is not considered best practice, although it is reasonably good practice, especially for a Regional area of NSW.

ADC collects MSW weekly in a 120 litre MGB. Best practice is moving to a fortnightly waste collection service.

ADC collects garden organics fortnightly in a 240 litre MGB. Best Practice is a weekly collection of combined food and garden organics in a 240 litre MGB.

ADC collects recyclables in crates on a weekly basis, one week for containers and one week for paper and cardboard. Best practice uses MGBs either on a weekly basis (2x120 litre MGB's) or fortnightly (240 litre MGB).

ADC has stated in its EA, that an application of Alternate Waste Technology (AWT) or the separation and treatment of food and garden organics will be pursued.

AWT or Thermal treatment is not considered viable by this author in the short or medium term for ADC, mainly due to low available tonnages (in the order of 15,000 TPA) and the absence of a Landfill Levy (an external economic driver away from landfilling).

AWT's are high cost facilities that require large tonnages (in the order of 50,000 TPA) to be viable. The statement in the Submissions Report (Page 15), that:
*'…the putrescibles waste composting and stabilisation processes are planned for implementation in 2011'* will not be possible to achieve. The AWT facilities that process MSW take years to develop and commission to operating standards. ADC needs to act quickly on more appropriate waste minimisation measures.

ADC have detailed (Page 21) that Thiess Services will investigate Biocells as a means to treat MSW . This technology would be used to treat MSW prior to being landfilled. There would be some acceleration of the stabilisation of this material, however, this technology ought <u>not</u> be considered equivalent to AWT Technology.

In contrast, the development of a food and garden organics processing facility, also detailed in the Submission Report, would have significant benefits in the ADC area, some of these being:

- Better utilisation of the existing 240 litre garden organics service, which could be changed to weekly and accommodate food quite easily
- An expansion of food organics collection into the C&I sector

- The likely utilisation of the existing landfill site to locate a processing facility
- The potential addition of other organic wastes (such as biosolids and other industry/agricultural waste)
- The sale of processed compost back into the local marketplace
- The reduction in food organics to landfill, therefore making a non putrescibles landfill more possible and reducing harmful methane emissions.

To achieve the proposed timing for a food and garden collection and processing facility in 2011will need a very determined effort.

The actions for improved resource recovery that are detailed on Pages 21-23 of the Submissions Report, in order to achieve Diversion Targets are commented on below:

| Proposed Action | Commentary of Effectiveness and Practicality |
|---|---|
| i) Regional Synergies | The proposed use of NIRW in market development is a step towards improved sustainability. A Regional Landfill Capacity assessment would be useful in determining the longer term needs of the region. |
| ii) Reduced Charges and Penalties | This policy is useful in ensuring adequate supply of waste material to the facility (especially the 2 to 2.5 times penalty factor for unsorted material). A landfill full cost accounting analysis should be undertaken to underpin the landfill costs |
| iii) Clean Materials MRF | The idea of using penalty income to develop C&I MRF is a further step towards meeting the NSW targets.<br>Focus also needs to be on measures to extract food organics from the C&I stream for processing. |
| iv) Domestic Recyclables | It is accepted that there are low contamination levels from crates, but the yields are typically lower than what is achieved through a co-mingled recycling collection. Higher yields contribute to improved processing economies.<br><br>A tender process or business case should be pursued to market test the economics of using crates as they are now phased out in most areas. Council's responsibilities regarding OH&S considerations also need to be considered. |
| v) E Waste | A good local initiative. A close investigation of the E Waste part of the RRC Centre, such as a Business Case, should be undertaken. In particular, the processing and final outcomes being achieved need to be best practice.<br>The Federal Government will be introducing a recovery system for computers and TV's in 2011 so this needs to be taken into account.. |
| vi) Resource Recovery Centre | This is a beneficial concept and should be encouraged. The tender should seek to test different models (ie commercial, community etc) so Council understand what premiums are being paid. |
| vii) Waste Transfer Stations | The facility is well designed and seems to work well. Emphasis on waste diversion and recovery is to be |

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|---|---|
| | encouraged. |
| viii) Chemical Wastes etc | This is a good activity and should be promoted |
| ix) Compact Fluorescent Lighting | This is a good activity and should be promoted |

The above actions for increased resource recovery do not highlight what will be done in terms of food and garden organics in the ADC Council area. The recovery of food organics in particular, has to be pursued aggressively if the 66% diversion targets are to be achieved.

ADC has introduced some progressive waste recycling programs especially in the C&I and C&D sector. These include the disassembly and recovery of E-Waste and the reprocessing of building materials as well as development of the Resource Recovery Centre. The Swamp Road site has excellent potential to become a recycling hub for ADC, where waste material is sorted, processed and recovered prior to landfilling.

### *4.2 Need and Justification*

Even with the most ambitious resource recovery programs employed, ADC will require a landfill in the foreseeable future. Landfills are still required in Coffs Harbour, Port Macquarie and Port Stephens, where AWT technology is used to process MSW. The desire of ADC to move towards a non putrescible landfill is an excellent objective, however a putrescible (Class1) landfill will still be required as a backup at least in the short to medium term (5-10 years).

It appears clear from both the ADC and the NSW Office of Environment and Heritage that expansion opportunities at the existing Long Swamp Road Waste Management Facility are limited. There is no other existing suitable landfill or transfer station site that could be expanded to accept the estimated 15,000 tonnes per year for disposal.

It is clear both from the EA and from a site inspection that a new landfill is the only long term solution for waste that needs to be disposed of by that method.

This being said, it is relevant to note that the ADC estimates of 15,000 tonnes per year are on the ‘high side’ (Page 33 of EA) as there has been a downward trend in recent years due to major construction projects in Armidale coming to an end. The need for a new landfill should not overshadow the need for further waste minimisation and recovery measures.

Landfill security is needed in the region from a public health perspective, as in the foreseeable future there will continue to be some wastes that cannot be recovered or treated viably.

It is accepted that alternatives to landfilling have been considered in the EA but at this time, none are viable enough to treat all of the waste destined for landfill. The option of transporting waste to other areas, such as Coffs Harbour and Tamworth, is expensive and carries financial as well as community acceptance risks. From a broader sustainability perspective, it is considered that the waste generated by ADC should be treated and disposed of, where possible, in that region.

AWT Technologies for fully treating MSW are not considered viable at this time for ADC, however an Organics Processing Facility should be seriously considered.

It is also noted that ADC plan to maintain and expand the existing Long Swamp Road site as a waste recovery and recycling facility, which is to be encouraged.

### *4.3 Best Practice Landfill Design and Operation*

The key to good landfill design is compliance with the benchmark techniques recommended by the Office of Environment and Heritage. One of the critical elements is the quality of the landfill liner, which prevents migration of leachate into the groundwater table. This is of particular relevance on this site and the prevention of migration of toxic liquids into the waterways leading to Oxley Rivers Wild Park or to subterranean water supplies of nearby farmlands. Ongoing monitoring of groundwater ought to be considered as a condition attached to approval of this proposal.

The combined 'double liner' of compacted clay and HDPE Plastic proposed for the Armidale Regional Landfill is of a standard greater than that required under the standard Benchmark Technique for solid waste landfills.

The yet to be developed Landfill Environmental Management Plan (LEMP) will detail how the site will be managed from an operational context, and the Environmental Protection Licence (EPL) will detail monitoring and reporting requirements that will need to be adhered to.

On Page 16 of the Submissions Report (April 2001) the Proponent states that *' Putrescible material will be composted or stabilised in a biocell at Councils Long Swamp Road Facility before the residual waste is transported to the landfill.'*

*What is a Biocell??*

*The Biocell promotes sustainable solid waste management and extends the landfill bioreactor concept to include principles of sustainable development. In a first stage, the Biocell is operated as an anaerobic bioreactor for enhanced landfill gas production using leachate recirculation. In a second stage, air is injected into the solid waste matrix to convert the operation to an aerobic bioreactor. In a final stage, the Biocell is mined for material and space recovery. Mining entails the use of many technologies to separate recyclable materials and compost or refuse derived fuel (RDF) from stabilized solid waste.*
*From The Calgary Biocell: A Case Study in Sustainable Solid Waste Management (2007).*
This is an important step and one to be encouraged as it will reduce methane emissions and odour at the landfill site. It will however be more complicated operationally as the waste material will need to be handled twice prior to landfilling. The additional handling will add to overall system costs. Alternatively, Council should consider applying this step at the new landfill rather than at the Long Swamp Road Facility.

### *4.4 Location of the Landfill*

The Proponent appears to have undertaken a comprehensive process in terms of site selection for this landfill. A site inspection by the author in company with others revealed that the site appears suitable from an environmental and operational context.

### *4.5 Optimising of Transport Links*

It is agreed that transporting waste to Coffs Harbour is not viable and other sites such as Inverell or Tamworth are limited by capacity issues as well as transport distances. No other existing facilities are available within viable distances.

The proposed site is reasonably well located in terms of transport access from ADC.

## 5.0 Economic Considerations

The Proponent has, in the Submissions Report dated April 2011 (pages 24-27), provided more detail on some of the economic issues of concern to the DoP. The author has provided some comments below on these issues.

| Issue | Comment |
|---|---|
| a) Landfilling vs Baling | It is accepted on the basis of the tonnages anticipated that baling would be more expensive than landfilling. As waste will be handled twice prior to landfilling anyway (Biocells) and there is lower leachate and less fauna intrusion, the difference of $4 per tonne does not seem excessive. |
| b) Collecting & Processing Food and Garden Waste | It is not considered practical to collect the food/garden on a fortnightly cycle as the OEH recommend weekly. Additional capacity will not be the issue, rather frequency. |
| c) Kerbside Recycling Service | The overall cost of the current recycling service is comparable to a wheelie bin service (approx $75 per premises per year) |
| d) Gate Price Estimates | It is accepted that the cost of transporting and disposal of waste outside the region to Tamworth or Coffs Harbour would be excessive. |
| e) Projected Charges and Gate Prices | First 2 cell costs are $14 million – estimate of 20 year life.<br>The DWM charges are noted. Suggest that modelling on weekly organics instead of fortnightly to see what impact this has. As a comparison, Councils with 3 stream collection often have DWM above $300 per year. |

## 6.0 Landfill Life Estimates

The ADC proposal is to construct 5 landfill cells, each of approximately 211,000 cubic metres capacity. The EA states that a compaction rate of 0.85 tonnes/cubic metre will be achieved, so that each cell will hold approximately 150,000 tonnes of compacted waste. Therefore each cell is anticipated to last around 10 years, with an annual input of 15,000 tonnes of waste.

The author believes the estimated annual tonnage of 15,000 to be landfilled is an overestimate. Around 14,000 tonnes was landfilled in 2008/09 and with more aggressive recycling and recovery, such as the biocell stabilisation of MSW, the recovery of organics, from both the residential and commercial sectors, improved commercial recycling and the ongoing slow population growth this number should further decrease. It is accepted that other outlying towns may participate in future years of the project but this will not make a significant difference to the tonnage landfilled.

As an example, if the annual estimated tonnage can be reduced by even 10% to 13,500 tonnes, then each cell life is extended by over 12 months, or a 20%reduction would result in an additional 2.5 years landfill life.

Further improvements could also be achieved by improved waste compaction rates. A larger compactor and improved work practices can increase compaction levels above the estimated 0.85 tonnes per cubic metre by at least 5%. The efficiency of compaction is a critical point as the viability of the project increases and the risks and costs decrease with more efficient compaction.

## 6.0 Conclusion

A coherent waste management strategy is required to detail the current programs and resource recovery being achieved and importantly to provide a clear strategic direction for future services, infrastructure, community engagement and policies for ADC. The community needs to see how the requirement for a new landfill fits within what is being done already and what is being proposed.

It is important that ADC secure long term landfill security for their community.The EA and responses have proven, to this author, a justifiable need for a new landfill to be constructed. It is equally important however, that waste be minimised at the source and that active recycling and additional recovery programs be implemented.

The optimum way that both landfill security can be assured and resource conservation encouraged in the community is to cap the cubic capacity of landfill space available in this Project.

Capping landfill capacity for this project would place responsibility back on ADC to implement the wide range of waste recovery and recycling measures contained in the EA. It will be in the community's interest to maximise the airspace available in the landfill.

It is the author's view that a 5 Cell, 50 year plus approval would not give the ADC the incentives they need to continue on a progressive waste minimisation and recycling pathway. 50 plus years is beyond a reasonable planning horizon and this approval would send the wrong message to the community about the role of landfilling.

A more realistic solution would be to limit the Project capacity for Cells 1 and 2 only. This would not compromise the financial viability of the Project as most of the capital (estimated $14 million) will be spent on the construction of the first 2 cells. Some deliberation has been given as to whether recommending approval for Cell 1 only would be sufficient. It is the author's conclusion that a 'Cell 1 only' approval may jeopardise the financial viability of the project and would not give the community a long term landfill security that it needs.

It is therefore considered that approval should be given for **Cells 1 and 2** of this Project, each containing a total of 211,000 cubic metres of waste and cover material (Page 51 of the EA). This would give the ADC a total landfill capacity of **422,000 cubic metres,** which is estimated in the EA to last at least 20 years. However it is likely that this life could be extended to at least 25 years with improved recycling, better waste minimisation and greater landfill compaction.

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