

7.0 Socio-economic Environment Assessment of Impacts

This section considers the impact of the proposal on the land use, socio-economic situation, traffic, visual amenity, hazards and risks, health and heritage of the surrounding area.

7.1 Landuse

7.1.1 Existing Environment

The site of the proposed SAWT-BIOWISE facility, located in Kemps Creek between Penrith and Liverpool at the western edge of metropolitan Sydney, is an active rural and research area. University of Sydney has agricultural research facilities in this vicinity and the area is predominantly rural with large and small holdings and low population density. Other land uses include market gardening, flower growing, poultry farms and hobby farms. There are two other waste facilities and a waste transporter in the area.

The Site is approximately 7.5 km from the closest urban area of Erskine Park. The Sydney Metropolitan Strategy (2004) has identified land south of Elizabeth Drive for future urban development. The proposed SAWT-BIOWISE facility forms part of a larger site previously known as the Badgerys Creek Quarry. The site currently operates as a quarry and landfill. Through quarrying and landfilling operations, a large number of various vehicles have accessed the Site using Elizabeth Drive and the external and internal access roads since 1990.

Amenity

The controls placed on air quality, noise, traffic and visual impact, as described and recommended in this report, will protect the amenity of the local area during operation. Dust and odour will be strictly controlled and extensive tree planting and the landform of the landfill will screen the facility. Traffic will increase on the access road to the landfill and this road is shared by one other property, 1669A Elizabeth Drive which is residential. **Section 7.3** of this report considers this in detail.

During the first six months of the construction period, there may be disturbance to immediate neighbours as a result of construction traffic, dust and noise. These impacts have been assessed and detailed mitigation measures and monitoring will be implemented to minimise impacts on amenity.

7.2 Socio-economic

The area around the Elizabeth Drive Landfill site is enclosed in a triangle created by Badgerys Creek, South Creek and Elizabeth Drive. PCC's Rural Lands Study described this area (Badgerys Creek) as wide-open in nature, with a high proportion of large lots (43% over 42 ha) and a low proportion of rural residential and intensive agriculture. Agricultural land in the locality is all Class 3, capable of regular cultivation with a moderate risk of erosion. There are a total of 16 properties and 13 dwellings in this area.

Property Impacts

Given that the site is currently a landfill, development of the SAWT-BIOWISE facility is not expected to have a long-term impact on property values. In the short-term, the public perception of the SAWT-BIOWISE as a facility for putrescible waste will be based on conventional putrescible waste landfills. Once the SAWT-BIOWISE facility is constructed and operating, and mitigation measures are in place, it is anticipated that the public will perceive the facility as low-impact and no change in property values is expected. Adjoining landowners have all been involved in the consultation process as part of the rezoning process.

Waste Disposal

The SAWT-BIOWISE facility will accept waste from Penrith and Liverpool LGAs. The SAWT-BIOWISE facility could also potentially accept municipal waste from the Fairfield, Campbelltown, Blacktown and other LGAs. The facility will provide a sustainable long-term solution for the communities it serves. Use of the facility will not require changes in the types of waste collection provided, but it is expected that there will be an impact in the cost of disposal (**Section 7.1.2**).

Table 7.1 provides information on the social characteristics of the Badgerys Creek area. Compared with both Penrith LGA and the whole of NSW, the Badgerys Creek area has a higher proportion of residents born overseas and speaking languages other than English at home. The average household size is larger and there are fewer people aged under 14 years.

Table 7.1: Social Characteristics

Characteristics	NSW	Penrith LGA	Kemps Creek / Mt Vernon
Born overseas	23.4%	21.2%	28.3%
English only spoken at home	78.8%	81.7%	52.6%
Population aged 0-14	28.8%	24.5%	22.9%
Population aged over 65	13.1%	6.9%	12.8%
Average household size	2.6	3	3.7

Employment

The Elizabeth Drive Landfill currently employs five permanent staff and generally has an additional eight contractors working permanently on the Site. The proposed project will generate employment opportunities during construction and operation.

Construction will require skilled and unskilled workers, the number of which will be ascertained after final design, to undertake earthworks and civil infrastructure works, building works and the installation of mechanical equipment. Construction is expected to take approximately twelve months with a further period needed for commissioning the plant. Most construction work will be contracted out to local firms.

Operation of the SAWT-BIOWISE facility will generate permanent employment. Opportunities include:

- Up to 19 jobs initially and up to 30 jobs when the proposed second shift is required. These are direct employment by SITA at the SAWT-BIOWISE facility;
- Unskilled workers, such as resource recovery workers, and semi-skilled workers, such as front-end loader operators, drivers, tradespersons and supervisory staff; and
- Training for all staff.

7.2.1 Economics

Disposal costs for putrescible waste in the Sydney Metropolitan Area have risen from \$18/t in 1990 to between \$92 – \$127 in 2006. As at 1 July 2006, the Section 88 Levy is \$30.40 and will rise by the consumer price index and \$7.00 per tonne every year for the next five years (**Section 3**). Costs will continue to rise as landfill space becomes increasingly scarce and landfill levies increase. Replacing conventional landfilling with advanced waste treatment will initially lead to a small increase in the cost of disposal in Sydney where disposal costs are already high. The cost difference is expected to become smaller as landfill costs increase.

A cost benefit analysis of another advanced waste treatment facility in Sydney has shown that the financial costs were significantly outweighed by the environmental benefits of advanced waste treatment (Lawson et al, 2004). The net environmental benefit would consist of avoided landfill costs from recyclables and organics, recycling credits and sale of compost, and in general, improved sustainability with respect to waste treatment and disposal. In addition, there are wider economic benefits from the creation of jobs and the use of operating and maintenance expenditure.

7.3 Transport and Traffic

A description of the onsite operational and construction vehicle movements is covered in **Sections 4.11.1** and **4.12.6** respectively.

7.3.1 Existing Traffic

Surrounding Road Network

The proposed SAWT-BIOWISE facility is co-located within the Elizabeth Drive Site boundaries. Access to the proposed SAWT-BIOWISE facility will be via the current Elizabeth Drive Site access road, east of Luddenham Road. Elizabeth Drive provides local access to many other rural and industrial developments along its length. Overall, the proposed SAWT-BIOWISE facility is well connected to Western Sydney via major arterial roads and freeways.

Elizabeth Drive connects the Westlink M7 and The Northern Road. It provides an indirect link from Western Sydney and Penrith to the Sydney CBD. Elizabeth Drive is predominantly a two-lane road with an upgraded section to four lanes linking the Cumberland Highway, Wallgrove Road and the M7.

Figure 7.1 shows the relationship between Elizabeth Drive and the surrounding road network. In summary:

- Mamre Road links the M4 motorway to the eastern section of Elizabeth Drive;
- Luddenham Road, via Mamre Road, links the M4 motorway to the western section of Elizabeth Drive;
- The M4 motorway is a high standard four and six lane divided road, which is parallel to Parramatta Road and the Great Western Highway between Strathfield and the Blue Mountains;
- The Northern Road is an arterial road that connects Camden in the south to Penrith in the north;
- The Cumberland Highway is located between Liverpool and Northmead and forms part of the strategic highway network, from the south-west to the north-east of the State; and
- The Westlink M7 connects the M5 at Prestons in the south, with the M4 at Eastern Creek and the M2 at West Baulkham Hills in the north and is a toll road.

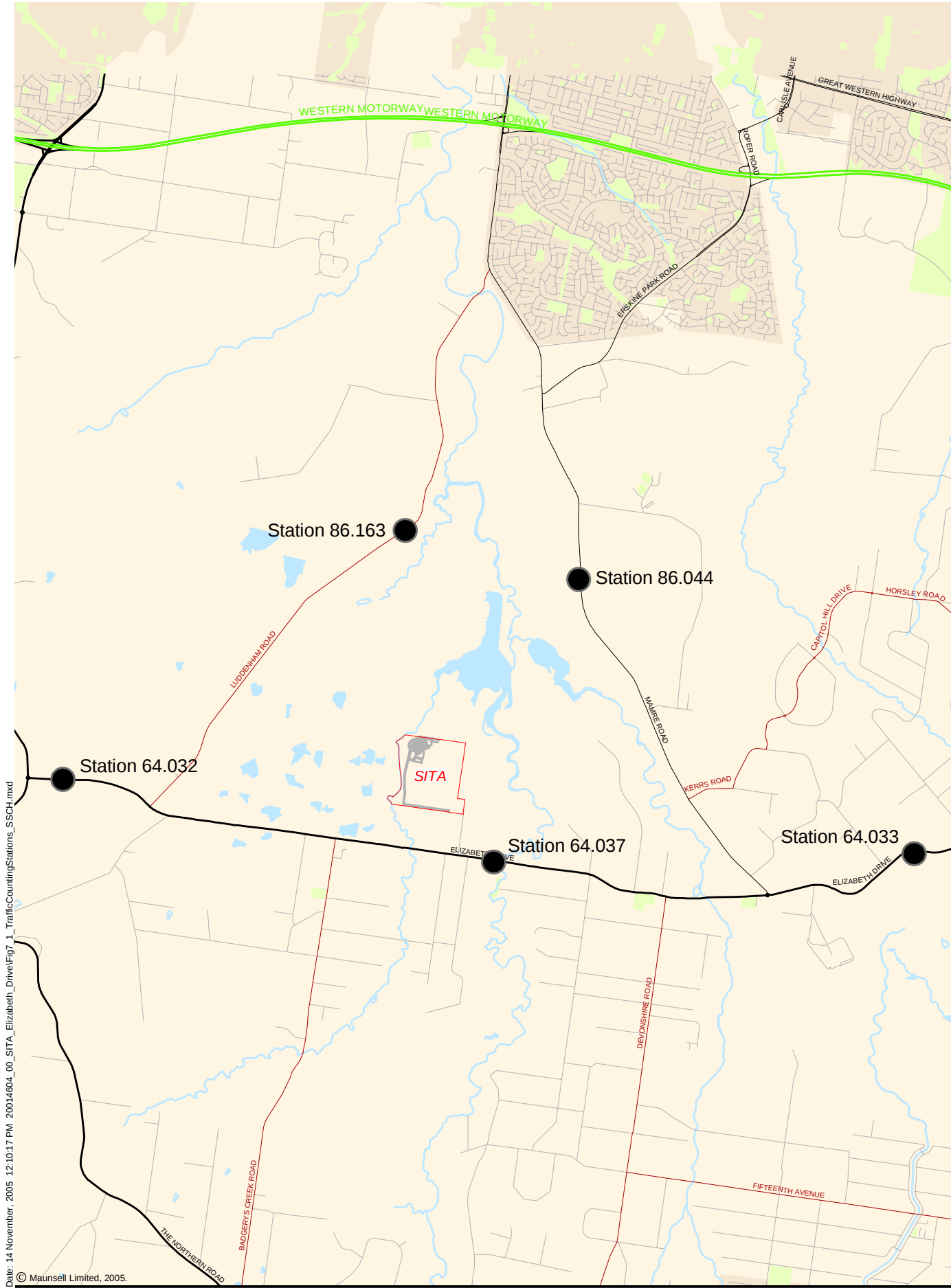
Road Network Traffic Volumes

A number of vehicle counting stations are located permanently on the road network surrounding the proposed SAWT-BIOWISE facility (**Figure 7.1**). RTA Annual Average Daily Traffic (AADT) data is shown in **Table 7.1** and displays a summary of the traffic volumes recorded at these stations over past years. Traffic volumes and trends shown in **Table 7.1** indicate that:

- The main traffic flow is between Elizabeth Drive and Mamre Road, located east of the SAWT-BIOWISE facility;
- AADT on Elizabeth Drive at the entrance to the existing Landfill increased by approximately 13% between 1996 and 1999 and then remained relatively constant between 1999 and 2002 (Station 64.037 is located approximately 500m east of the existing entrance to the Landfill);

- Peak hour traffic flow on Elizabeth Drive is approximately 950 vehicles per hour passing the entrance to the Landfill (approximately 10% of AADT)⁵;
- AADT on Elizabeth Drive, west of Luddenham Road (Station 64.032) increased by approximately 15% between 1996 and 1999 and then remained fairly constant between 1999 and 2002; and
- AADT on Elizabeth Drive between Cecil Park and Wallgrove Road (Station 64.033) increased by approximately 11% between 1996 and 1999 before decreasing by approximately 7% in the period between 1999 and 2002. This section of road has the highest daily traffic flow in the area with an AADT of 17,910.

⁵ Based on comparison between AADT and mean weekday peak hour periods at Station Number 64.033 Elizabeth Drive between Cecil Park and Wallgrove Road



Advanced Waste Treatment Facility
Elizabeth Drive

FIGURE 7.1: Location of Traffic Counting Stations

Table 7.2: Average Annual Daily Traffic (AADT) on Adjacent Road Network

Station Number	Station Location	AADT Volumes – Year			
		1996	1999	2002	2005**
64.037	Elizabeth Drive at South Creek Bridge	8,041	9,117	9,098	9,655
64.032	Elizabeth Drive Between Northern and Luddenham Road	5,879	6,753	6,592	6,995
64.033	Elizabeth Drive Between Cecil Park and Wallgrove Road	17,274	19,180	17,910	19,006
86.044	Mamre Road Between Bakers Lane and Erskine Park	10,859	12,153	12,446	13,608
86.163	Luddenham Road at Sydney Water Supply Pipeline	2,085	2,524	2,586	2,827

Reference: RTA Traffic Volume Data 2002 Sydney Region Volume 1

**** Data for 2005 not yet available. Maunsell estimation, based on 2002 data, with a growth factor of 2% per annum (based on historical growth rate on Elizabeth Drive from 1996 to 2002)**

In summary, the analysed traffic volumes on the local network between 1999 and 2002 increased by between 10% and 15%. Since that time, the traffic volumes have remained relatively constant and the traffic volumes estimated for 2005 are based on a growth factor of 2% per annum over the 2002 figures.

Traffic Accident History

Analysis of traffic accident history for the section of Elizabeth Drive between Mamre Road and Luddenham Road was conducted to establish the number of traffic accidents occurring along a 9 km section over the five year period between 1998 and 2003. RTA traffic accident records for this section of road shows:

- A total of 69 reported accidents;
- One (1.4%) fatal accident;
- 30 (43.5%) injury accidents; and
- 38 (55.1%) non-casualty accidents.

Further assessment of these accidents revealed:

- 27 accidents (39.1%) occurred within 10m from an intersection;
- 42 accidents (60.9%) occurred at areas other than intersections; and
- 26 accidents (37.7%) involved light, rigid and articulated trucks.

Records show that three of these accidents (4%) were reported at the intersection of Elizabeth Drive and the existing Landfill access. The details of these three accidents are shown in **Table 7.3**.

Table 7.3: Accident Data for Intersection of Elizabeth Drive and the Elizabeth Drive Site Access Road

Accident Date and Time	Accident Severity	Colliding Vehicles	Accident Type
Friday 28/05/99, 0530 hrs	Non-casualty	Car/Car	Side swipe
Monday 10/12/01, 1116 hrs	Non-casualty	Semi Trailer/Car	Failure to give way
Wednesday 12/03/03, 1620 hrs	Injury	Car/Car	Rear end

Reference: RTA Accident Records

However the data obtained from RTA records does not identify the purpose of travel or any connection with the Landfill. While **Table 7.3** indicates the accidents known to have occurred during recent years at the intersection to the Elizabeth Drive Site, this accident data is not directly attributable to the Elizabeth Drive Site. Each of the three accidents is of a different type, and no pattern can be discerned.

Existing Arrivals at Site

Under the existing Development Consent, SITA is currently licensed for 780 vehicle movements per day, which is equivalent to 390 vehicle arrivals to the Elizabeth Drive Site, daily. Although the existing PCC Development Consent allows this number, SITA does not receive this volume of deliveries for Landfill purposes. Current vehicle numbers are around 90 vehicles delivering waste, 99 vehicles removing quarried material and 13 staff vehicles per day, which equates to 404 vehicle movements per day.

SITA's current Landfill operations at Elizabeth Drive accept only waste from commercial clients. Condition 59 of the PCC Consent states, "No wastes transported to the Site by the general public shall be disposed of on the lands. This includes materials/wastes transported in or by conventional sedan or station wagon passenger vehicles driven by persons not engaged in commercial waste disposal". Accordingly, the majority of vehicles entering the Site are in the medium (3 to 10m³ or 1 to 2t) to large (greater than 10m³ or greater than 10t) category, with only a few small (less than 3m³ or less than 1t) vehicles, such as utilities and flat top trucks from local contractors.

The types and description of vehicles that currently deliver waste to the Elizabeth Drive Site are listed in **Table 7.4**.

Table 7.4: Current Types of Vehicles Delivering to Elizabeth Drive Site

Vehicle Description	Origin	Vehicle Type	Approximate Capacity (t)	Waste Type
Transfer Vehicles	Transfer Stations	Heavy combination, mainly semi-trailers	20-25	Non-putrescible 'general' Solid Waste
Skip Vehicles (Cable, Hook and Dino)	Individual generators, primarily commercial	Heavy rigid	10	Bulk loads of general or special wastes (Inert, Solid and Industrial)

Vehicle Description	Origin	Vehicle Type	Approximate Capacity (t)	Waste Type
Front Lift Vehicles	Multiple generators, commercial/industrial areas	Heavy rigid	6-8	Non-putrescible 'dry' general Solid Waste
Rear Lift Vehicles	Multiple generators, commercial/industrial areas	Heavy rigid	6-8	Non-putrescible 'dry' general Solid Waste
Small vehicles	Commercial clients	Utes, light and medium rigid	0.5-3	Generally construction and demolition material (Inert and Solid Waste)
Tipplers	Site Remediation contractors / consultants	Heavy rigid, heavy & multi combination including dog trailers	10-54	Special wastes – Contaminated Soils (Inert, Solid and Industrial)

Reference: SITA data

The management systems of the existing landfill facility records the number of waste vehicle entries to the Landfill. This data has been recorded since the commencement of the Landfill's operations in February 1992. Daily arrivals at the Elizabeth Drive Site access were analysed for the six month period between 1 October 2006 and 31 March 2007. This six month period was deemed to be the most accurate representation of current waste delivery practices to the Elizabeth Drive Site, as data before this period possibly may be out of date reflecting changes in the solid waste landfill market and hence affecting waste volumes delivered to the Landfill.

The summary in **Table 7.5** indicates that the total number of trucks arriving within this six month period was 10,663 vehicles. This number comprises 2,150 trucks arriving to remove clean excavated material off-site and 8,513 trucks arriving for material collection and waste delivery. Of all the waste delivery trucks arriving, approximately 92% approach from the east and 8% from the west. Current SITA data shows that there is an average daily total of 90 material collection and waste delivery vehicles, with 83 arriving from the east and seven from the west.

Table 7.5: Summary of Daily Waste Delivery Vehicle Arrivals at Elizabeth Drive Site Gate (2006-2007)

Time Period	Total Number of Material Collection and Waste Delivery Vehicle Arrivals	Approach to Site from Elizabeth Drive	
		East	West
Oct 06 – Mar 07	8,513	7,832 (92%)	681 (8%)
Average Daily	90	83	7

Reference: SITA Client Delivery Summary, October 2006 to March 2007.

The majority of arriving waste delivery vehicles approach the Landfill from the east. Specifically, over 40% of the waste delivery vehicles arriving at the Landfill originate from SITA's Davis Road Transfer Station. From here the most direct transport routes are from Wallgrove Road or Cowpasture Road and then onto Elizabeth Drive.

A smaller number of vehicles enter the Elizabeth Drive Site from the industrial areas around Smithfield, Wetherill Park and Hoxton Park, further east of Wallgrove Road. A fewer number emanate

from Liverpool and east of Liverpool or from the south, such as the Wingecaribee and Campbelltown regions from either direction along the M5 Motorway.

Approximately 8% of waste delivery vehicles approach the Elizabeth Drive Site from the west along Elizabeth Drive. These vehicles are predominantly front lift commercial vehicles or vehicles carrying special waste/contaminated soil from the Penrith LGA or areas south and south-west of the Elizabeth Drive Site such as the Campbelltown and Camden LGAs.

This volume of arrivals from the west is much lower than just two years ago. In 2004 it was estimated that 12% of arrivals approached the Site from the west. This change is thought to be due to the recent opening of the Westlink M7, which re-routes traffic from the west.

As the recorded waste delivery traffic entering the Landfill from Elizabeth Drive east is, on average, 83 vehicles per day, the resulting two-way flow can be considered as 166 waste delivery movements per day. This equates to only 2% of the 9,655 AADT on Elizabeth Drive (as estimated for 2005). Delivery traffic entering and exiting the Landfill from Elizabeth Drive west (approximately 7 vehicles per day) is significantly less than 2% of the estimated AADT on Elizabeth Drive in 2005.

The traffic levels described in **Table 7.5** include vehicles carrying waste to the Landfill but do not take into account the mode of travel by employees. At present there are approximately 13 staff cars that arrive between 6am and 9am and depart between 3pm and 6pm. There are no employees who travel to work by other modes of transport. It is assumed that staff vehicles arrive approximately 50% each from the east and west along Elizabeth Drive.

Therefore, the current overall total number of vehicle movements for material collection and waste delivery, removal of clean excavated material and staff vehicles (i.e. a vehicle is counted upon arrival and again on departure) on an average day is 404 vehicles.

7.3.2 Potential Impacts

Traffic Generation – During Operation

Waste will be delivered to the proposed SAWT-BIOWISE facility in a variety of vehicles ranging from semi trailers to commercial waste vehicles, however the vast majority will be domestic waste collection vehicles. Vehicles will travel along various State and regional roads to access the SAWT-BIOWISE Site, depending upon the source of the waste. At maximum capacity there will be a total of up to 120,000 tpa of waste and up to 14,400 tpa of Biosolids received at the SAWT-BIOWISE facility. Although SITA intends for the SAWT-BIOWISE facility to be developed in stages, the transport, traffic and access assessment is conservatively based on the maximum capacity of the SAWT-BIOWISE facility in full operation.

The SAWT-BIOWISE facility will be designed to treat up to 40 tonnes of waste per hour. SITA anticipates that waste will be delivered to the SAWT-BIOWISE facility during daylight hours throughout normal working days. The domestic waste collection vehicles have a payload of between 5 and 10 tonnes depending upon vehicle type. Semi trailers of mixed solid waste could have a payload of up to a 25 tonne capacity although this is normally closer to 20 tonnes. However, the number of semi trailers delivering waste to the SAWT-BIOWISE facility is expected to be low and as such, this assessment is conservatively based on an assumption that all waste will be delivered in domestic waste collection vehicles.

An average payload of 6.5 tonnes per vehicle has been assumed for the purpose of assessing the traffic impact of the proposed SAWT-BIOWISE facility. Therefore, based on an annual waste volume of 134,400 tonnes, an average payload of 6.5 tonnes and assuming 250 working days per year, SITA expects that an average of 85 waste delivery vehicles per day will arrive at the SAWT-BIOWISE facility. In addition, up to eight empty vehicles per day will arrive at the SAWT-BIOWISE Site to

transport compost and recovered recyclables from the SAWT-BIOWISE facility. Therefore, the average daily arrival of trucks at the SAWT-BIOWISE facility is predicted to be 93. Actual vehicle numbers will depend upon collection vehicle size, routing and traffic conditions and therefore will vary from day to day.

Future employee traffic is expected to increase by up to approximately 25 vehicles per day (50 vehicle movements per day). SAWT-BIOWISE facility employees will be required to work over a period that includes up to two, 8-hour shifts.

Traffic Origin and Distribution

Future vehicle origin, distribution and proportion turning at the Elizabeth Drive intersection (to enter via the access road) are not expected to be the same as the existing Landfill traffic records indicate. This is because waste to be transported to the SAWT-BIOWISE facility will be of a different type compared to waste currently being landfilled at the Elizabeth Drive Site. Current Landfill traffic is primarily commercial, non-putrescible, Solid Waste Class 2 and Industrial Waste. The majority of this type of waste is generated in suburbs to the east of the Elizabeth Drive Site, which causes the current traffic arrival bias from the east.

SITA believes that a large proportion of the new waste that will be delivered to the SAWT-BIOWISE facility will be municipal waste, which, based upon the location of the proposed SAWT-BIOWISE facility, will have greater potential to be generated to the west and south of the Elizabeth Drive Site. For this reason, it is anticipated that a greater percentage of truck traffic delivering waste to the SAWT-BIOWISE facility will enter the Elizabeth Drive Site along Elizabeth Drive from the west. It is difficult to know the exact ratio of origin of these vehicles until the SAWT-BIOWISE facility is operational. However, as waste is anticipated from local government authorities predominantly to the west of the Site, for the purpose of analysis it is assumed that a 40%:60% east:west split of vehicles will deliver waste to the SAWT-BIOWISE facility from Elizabeth Drive.

For empty vehicles entering the Elizabeth Drive Site to remove compost and recyclables, SITA have assumed that 70% (6) of vehicles will arrive at the Elizabeth Drive Site from the east and 30% (2) from the west. This assumption is based upon the fact that since these vehicles arrive empty, they will be arriving either from their depots or from their sites of last load drop-off, which are more likely to be to the east of the Elizabeth Drive Site.

Thus, the total truck arrival flow (waste delivery plus empty vehicles) is estimated to be 93 vehicles, composed of 53 vehicles (60%) arriving from the west and 40 vehicles (40%), arriving from the east, along Elizabeth Drive.

It is also assumed that the direction of arrival of staff vehicles will be a 50:50 east:west split.

Summary

Table 7.6 summarises the approximate proposed daily vehicle arrivals to the Elizabeth Drive Site including current landfill vehicle arrivals and vehicle arrivals for SAWT-BIOWISE at full capacity.

According to **Table 7.6**, the total proposed daily arrival flow for trucks (waste delivery plus empty vehicles), including existing truck flow and current and projected employees' cars, is predicted to be approximately 320 vehicles daily at the Elizabeth Drive Site.

Table 7.6: Proposed Vehicle Arrivals

Vehicle Type	Arrival from East	Arrival from West	Total Arrivals
Existing Staff (Landfill)	7 (50%)	6 (50%)	13
Existing Material Collection & Waste Delivery (Landfill)	83 (92%)	7 (8%)	90
SAWT-BIOWISE Staff	13 (50%)	12 (50%)	25
SAWT-BIOWISE Waste Delivery	34 (40%)	51 (60%)	85
SAWT-BIOWISE Compost Removal (arrive empty)	6 (70%)	2 (30%)	8
Removal of clean excavated material from site (arrive empty)	59 (60%)	40 (40%)	99
Total	202 (63%)	118 (37%)	320

Site Access, Traffic Flow and Turning Movements

The potential impact of traffic turning right into the Elizabeth Drive Site from the east and using the proposed SAWT-BIOWISE facility is a function of the two-way traffic flow arriving from, and departing to the east along Elizabeth Drive. This flow is predicted to be a daily two-way flow (arriving from and departing to the east) of 404 vehicles. Since this proportion would contribute only 4.2% of the 9,655 AADT for 2005 (as estimated by Maunsell, based on 2002 data by RTA), the proposed SAWT-BIOWISE facility will have a negligible impact on general traffic on surrounding road networks.

To assess the impact of traffic turning right into the Elizabeth Drive Site from the east, average peak hour delay and queue length was calculated for the existing and estimated future right turning traffic. This analysis is shown in **Table 7.7**. Given the random arrival of vehicles to the Elizabeth Drive Site, the methodology used in the assessment was Standard Queue Length Theory in accordance with *Austroads Part 5: Intersections At Grade*. The following parameters were used:

- Estimated AADT of 9,655 (2005 estimate);
- The AADT consists of a 50-50 directional split of total number of vehicles travelling along the section of Elizabeth Drive east of the Elizabeth Drive Site;
- An hourly peak factor of 15%;
- A critical gap of five seconds; and
- Follow up headway of three seconds.

Table 7.7: Approximate Delay and Queue Length at Intersection for Vehicles Approaching from East

Facility	Ave Daily Number of Vehicles	Number of Vehicles in Peak (15%)	Approx Delay	Approx Queue
Existing Elizabeth Drive Site	149	22	4 Sec	1 vehicle
Proposed SAWT-BIOWISE Facility (at maximum capacity)	202	30	4 Sec	1 vehicle

Reference: SITA supplied raw data

Table 7.7 shows that both the approximate delay and queue length for both the existing traffic and for traffic to the proposed project are negligible. This is due to the low traffic flow arriving at the Elizabeth Drive Site from the east along Elizabeth Drive, when compared to the total vehicle flow along Elizabeth Drive in both directions. The current 'seagull' style intersection with a right hand turn lane

takes turning vehicles out of the main traffic flow to minimise potential queuing and delays in traffic travelling in a westerly direction along Elizabeth Drive.

7.3.3 Management of Impacts

Given the moderate traffic volumes expected to be generated by the proposed SAWT-BIOWISE facility and the minimal delay expected for vehicles turning right into and out of the Elizabeth Drive Site, no intersection upgrade or additional signals are required for the existing intersection on Elizabeth Drive.

The number of transport vehicles arriving and leaving the Elizabeth Drive Site will increase as a result of the proposed SAWT-BIOWISE facility. However SITA is not currently utilising the full extent of the existing PCC Development Consent limit of 390 vehicle entries daily to the Elizabeth Drive Site. The forecast of 320 vehicles per day for the combined SAWT-BIOWISE facility and Landfill operations is less than the current total daily vehicle limit allowed by the existing PCC Development Consent.

Overall the traffic impact from additional vehicles turning from Elizabeth Drive and accessing the Elizabeth Drive Site for SAWT-BIOWISE operations is a marginal increase on existing traffic flows on Elizabeth Drive. There will be an increased number of vehicles travelling to the Elizabeth Drive Site, but this number is in line with the total vehicle limit stated in the Development Consent, which currently is under utilised for the Landfill operations.

7.4 Indigenous and Non-indigenous Heritage

7.4.1 Existing Environment

The original landscape of the Elizabeth Drive Site has been modified substantially. Currently 84 ha have been approved by PCC for landfilling activities and the proposed SAWT-BIOWISE facility is located within this area. The likelihood of finding items of archaeological significance would be confined to the riparian vegetation along Badgerys Creek near, but outside, the proposed SAWT-BIOWISE facility. The SAWT-BIOWISE Site is situated to the east of Badgerys Creek and a wire mesh fence separates the Creek from the SAWT-BIOWISE facility along the northern and western boundaries of the SAWT-BIOWISE Site. The SAWT-BIOWISE Site consists of both cleared open area and a modified form of Cumberland Plain Woodland. Kohen, 1991, *Working Paper Number Two An Archaeological Survey at Lot 2 Elizabeth Drive, Badgerys Creek* (Appendix F) stated that “most of the area is grossly disturbed, and even those undisturbed areas (the SAWT-BIOWISE Site) appear to have been ploughed at some time in the past”.

7.4.2 Indigenous Heritage

The SAWT-BIOWISE Site is situated within a modified rural environment, however, the area of the existing Elizabeth Drive Landfill is extremely modified and remains a disturbed environment used entirely for waste and quarrying purposes. Sydney University is a neighbour along the northern and western boundary. The adjacent Badgerys Creek contains a riparian vegetation community. The riparian areas within the region tend to contain the highest density of Aboriginal sites. Kohen refers to Rhoades (1984) who noted in his archaeological studies within the Penrith LGA that Aboriginal sites do cluster towards seasonal streams or gully rises. There are no ephemeral streams present within the SAWT-BIOWISE Site. Badgerys Creek is the nearest locale likely to contain Aboriginal sites and site types along its series of meanders and dense riparian vegetation.

Searches of Federal, State and Local heritage items databases were conducted for items within a 1.5 km and 5 km radius of the Elizabeth Drive Site. The Federal Register of the National Estate has no listed heritage items within a 1.5 km or 5 km radius of the Elizabeth Drive Site. A radial search of the Elizabeth Drive Site using the Aboriginal Heritage Information Management System (AHIMS) has five open campsites listed, as well as other heritage items in two additional locations within 1.5 km

radius (**Figure 7.2**). Kohen's archaeological survey of the site in 1991 found no evidence of items of Aboriginal heritage within the SAWT site and one site of indigenous heritage adjacent to the site. This site type is an open campsite consisting of a surface scatter of stone artefacts located near the north-western corner of the SAWT-BIOWISE Site, adjacent to Badgerys Creek. Kohen coded the Aboriginal site as *Site KC/1 (Kemps Creek 1,)* the site has been registered by SITA on the AHIMS as site number 45-5-2367.

KC/1 is the only known Aboriginal site recorded for the relevant area. KC/1 consists of 22 stone artefacts found exposed over an area, 35m long and 20m wide, lying within 40m of Badgerys Creek. It is considered to be a typical site type of the region (Kohen 1991). KC/1 is located outside the proposed SAWT-BIOWISE Site, between the boundary fence, at about 50m, and Badgerys Creek. Kohen stated in 1991 "that the shallow nature of the deposit and its relatively small size indicates that it unlikely to be of great scientific or educational value".

KC/1 was exposed to the surface by works carried out by an earth-moving machine such as a front-end loader (Kohen, 1991). During heritage assessment for this NSW, in May 2004, attempts to relocate KC/1 by a specialist consultant (Environmental Appraisal and Planning) were not successful. Due to the passage of time, the Aboriginal site is now well covered with an extremely dense layer of riparian vegetation and weeds and the KC/1 site is no longer visible or exposed to the surface.

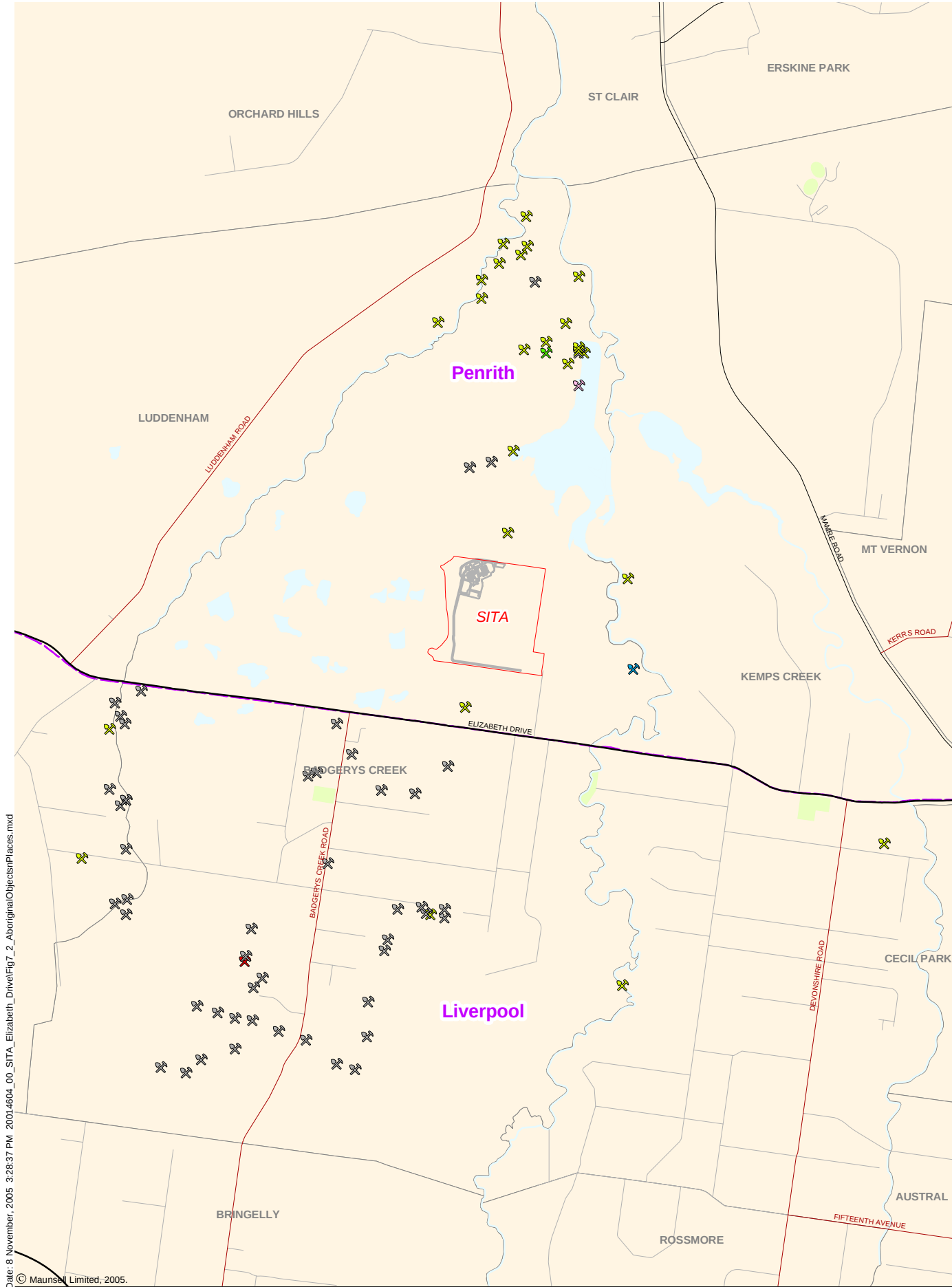
7.4.3 Non-indigenous Heritage

According to searches of the Federal Register of the National Estate, State Heritage Register, State Heritage Inventory and AHIMS, no sites of European heritage, historic or archaeological significance were found within a 1.5 km radius of the Site. A few sites within a 5 km radius were found but these are too distant to be impacted by the proposed SAWT-BIOWISE facility and operation.

7.4.4 Potential Impacts

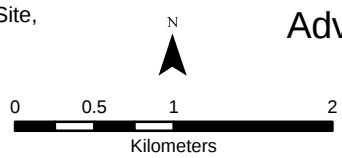
There are no anticipated direct or indirect impacts to Aboriginal site, KC/1, providing that the riparian precinct remains fenced and that building contractors or their building materials and spoil are excluded from the area. Kohen (1991) stated, "KC/1 is unlikely to be of great scientific or educational value. However, should the site be under threat, it would certainly require further investigation by test excavation to determine its full potential [sic]". Site KC/1 is located entirely outside of the SAWT-BIOWISE Site and therefore there will be no direct or indirect impacts on this Aboriginal site.

Since the SAWT-BIOWISE Site is located within an area of low archaeological potential and an archaeological survey has already been conducted at the site, it is considered that another archaeological survey of the SAWT-BIOWISE Site is not warranted in this instance (Danny O'Brien Pers. Comm. And Kohen, 1991). There is no need to consider seeking a *Consent To Destroy* permit for KC/1.



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- | | |
|---------------------|------------------------------|
| Open Camp Site | Open Camp Site, Scarred Tree |
| Isolated Find | Other |
| Scarred Tree | |
| Axe Grinding Groove | |



Advanced Waste Treatment Facility
Elizabeth Drive
FIGURE 7.2: Heritage Items
near the Elizabeth Drive Site

7.4.5 Management of Impacts

The riparian precinct will remain fenced and padlocked to ensure that contractors do not enter the KC/1 vicinity and that storage, building rubble and spoil materials are excluded. SITA recognises that it is an offence to remove, disturb or destroy any Aboriginal relic in NSW without the prior written consent of the Director-General of the NSW National Parks & Wildlife Service (now NSW DECC). Should any Aboriginal archaeological relics, deposits or sites be located or exposed during any SAWT-BIOWISE Site works, all works with the potential to disturb the site will cease immediately and the DECC's National Parks & Wildlife Service division will be contacted to confirm a course of action.

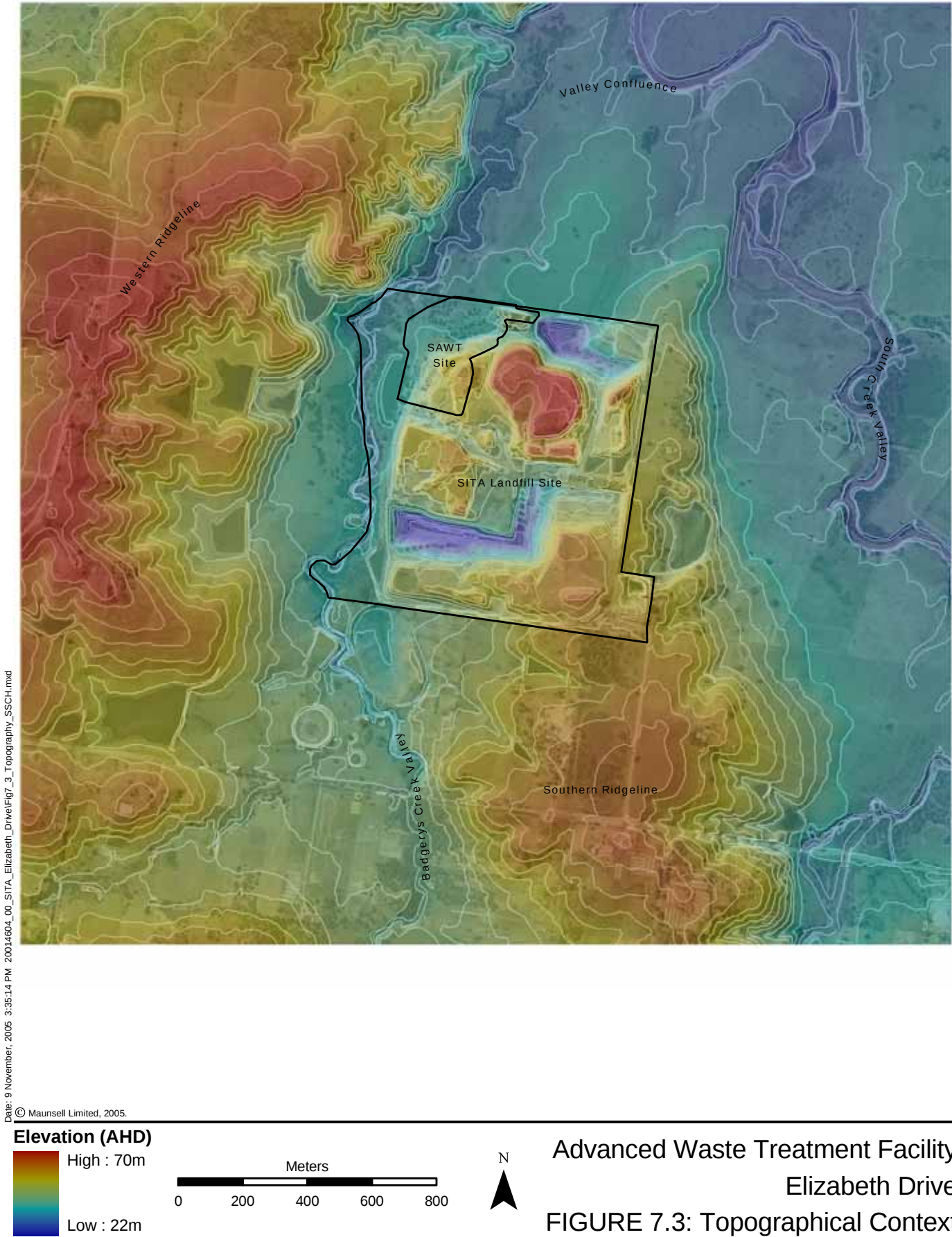
7.5 Visual Amenity and Landscape

This section of the EA assesses the potential visual impact of the SAWT-BIOWISE facility in the surrounding landscape. Assessment was made through comparison of visual impacts of the existing Elizabeth Drive Site, to those likely to occur following construction of the SAWT-BIOWISE facility, and those likely to occur when the Landfill is closed. Potential visual impacts were assessed on the basis of both the visibility and appearance of the proposed SAWT-BIOWISE facility. All elevations referred to in this section are given in Australian Height Datum (AHD) and have been taken from digital data.

7.5.1 Existing Environment

The Elizabeth Drive Site is situated in a relatively open landscape at the peak of a gently raised ridgeline bounded to the east and west by the South Creek and Badgerys Creek valleys respectively (**Figure 7.3**). The confluence of these two valleys is immediately to the north of the Elizabeth Drive Site. To the west of Badgerys Creek valley is another gently raised ridgeline. Elevations on the valley floors are typically around 26m AHD and around 70m and up to 100m AHD at higher vantage points along ridgelines.

The Elizabeth Drive Site has operated as a landfill since 1992. Landfilling operations involve rehabilitation of cells from which material has been excavated, with solid waste. The surrounding land use is mainly rural with a few small businesses and several university-owned facilities.



The temporary stockpile to the south-east of the proposed SAWT-BIOWISE Site is the current dominant feature in the local topography. This stockpile is visible from part of all neighbouring properties, to varying degrees. **Photograph 7.1** to **Photograph 7.6** in **Figure 7.4** show views from the top of the stockpile, and represent a continuous view from east, anticlockwise to west. Remnant native vegetation, especially along the creek lines, helps screen much of the SAWT-BIOWISE Site. Visibility of the existing operation from Elizabeth Drive is screened in most places by either the existing bund situated along the southern boundary of the Elizabeth Drive Site and by roadside vegetation (**Figure 7.5**).

Figure 7.4: Existing Views from Top of Temporary Stockpile at Elizabeth Drive Site

Photograph 7.1



Photograph 7.2



Photograph 7.3



Photograph 7.4



Photograph 7.5



Photograph 7.6



Reference: Photographs taken by Maunsell Australia during site visits in mid 2006

Currently the main activities of the landfill are not visible from Elizabeth Drive. However, as **Figure 7.5** demonstrates, the temporary stockpile is visible, though only when plant and machinery are at or near its summit.

Figure 7.5: View of Elizabeth Drive Site from Elizabeth Drive



Reference: Photograph taken by Maunsell Australia during site visits in mid-2006

During the ongoing Landfill operation, earthmoving will continue until the final approved landform is in place. The final landform will remain after the landfill closes and site rehabilitation has occurred. For the purposes of modelling, a period of 20 years from 2005 has been used to estimate when this final landform will be in place. The contours used for the diagrams in **Figure 7.6** show the difference in absolute elevation, over time.

Assessment of visibility was made using a viewshed model run in software (ESRI ArcGIS). A viewshed can provide estimates of visibility based on the elevation and height of surrounding landforms, vegetation and buildings. As a viewshed is a model only, the actual effects of vegetation can, in effect screen the view more effectively than shown. Inputs used in the model were elevation data for land surrounding the SAWT-BIOWISE Site, average heights of vegetation communities (NPWS 2002), final approved landform contours and relative levels of the SAWT-BIOWISE facility from conceptual design.

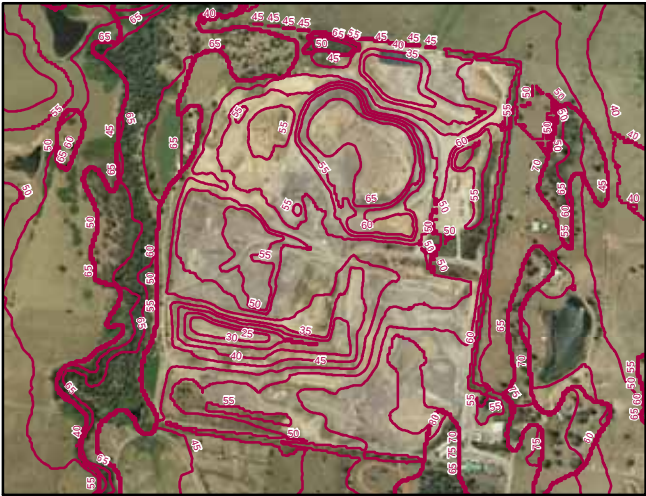
The effects of both distance and vegetation screening were also incorporated. Aerial photography and mapping layers supplied by DECC showed the extent of vegetation screening and a radius of 1 km around the SAWT-BIOWISE Site was adopted as the distance at which visual impacts can be considered as rapidly declining.

Figure 7.7 has been generated by the viewshed model, and considers three Stages. Stage 1 is the existing site and shows locations where the temporary stockpile is visible currently (shown in green on the plan). Stages 2 and 3 consider the SAWT-BIOWISE and are based on the existing site elevations and the approved final landform. The two Stages show locations from where the facility will be visible.

Over the next 20 years visual impacts will continue to be associated with the visibility of the temporary stockpile. The temporary stockpile is smaller and lower than the approved final landform. Stage 3 shows that the SAWT-BIOWISE is not visible from the south due to the final landform of the finished landfill. This indicates that the approved final landform is likely to have more visual impact on the locality than the SAWT-BIOWISE buildings. Additionally views from the west and south are largely screened by vegetation along the boundaries of the Elizabeth Drive Site and along Badgerys Creek.

Comparison of Stage 1 with Stages 2 and 3 illustrate that in most of those locations from which the SAWT-BIOWISE facility will be visible, the Landfill will also be visible. This effectively provides a camouflage and lessening the visual impact of the SAWT-BIOWISE facility. Both the temporary stockpile and the proposed SAWT-BIOWISE facility, at all three stages, are visible to the north-east.

A summary of **Figure 7.8** is provided in **Table 7.8**.



Stage 1: Existing

Stage 1: Existing SITA Landform



Stage 2: After SAWT Construction

Stage 2: SITA landform when SAWT facility operational (with main stockpile, landfill cells, stormwater ponds and vegetation)



Stage 3: After Landfill Closed

Stage 3: SITA landform in 20 years time (SAWT facility remaining, landfill at final approved levels and site vegetation fully grown)

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© Maunsell, 2006

Elevation Contours
Contour Interval 5m

Contours incorporate
the height of vegetation
and SAWT building heights

Elevations are given in
Australian Height Datum
(AHD)

Advanced Waste Treatment Facility
Elizabeth Drive
FIGURE 7.6: Prediction of SITA Landform
and SAWT Facility Over Time

Source: GA, 2006; Maunsell, 2006; SITA, 2006;

Neighbouring Residences

- A: McGarvie-Smith Farm
- B: McGarvie-Smith Farm
- C: McGarvie-Smith Farm
- D: 2140 Elizabeth Drive
- E: 1745 Elizabeth Drive
- F: SE dwelling
- G: Caretakers - 1669A Eliz. Dr.
- H: 1669A Elizabeth Drive

Stage 1 Existing Site

Visibility of temporary stockpile as at February 2004. Green shading denotes locations where part of the temporary stockpile can be seen. Neighbouring residences are bounded by white and labelled in letters.



Stage 2 After SAWT Constructed

Visibility of SAWT-Biowise facility. Green shading denotes locations where part of the facility will be visible.

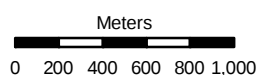
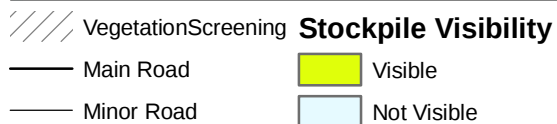


Stage 3 After Landfill Closed

Visibility of SAWT-Biowise facility after landfill closed in 20 years time. Green shading denotes locations where part of the facility will be visible.



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Advanced Waste Treatment Facility Elizabeth Drive

FIGURE 7.7: Visibility of Landfill over
Operating Time-Frame: 2004 to Closure

Table 7.8: Visual Impacts on Neighbouring Residences (including effects of vegetation)

Residence	Stage 1	Stage 2		Stage 3		Distance from SAWT-BIOWISE (km)
	Temporary Stockpile	Temporary Stockpile	SAWT-BIOWISE Facility	Final Approved Landform	SAWT-BIOWISE Facility	
A McGarvie Smith Farm	(neg)	(neg)	X	(neg)	X	1.1 west
B McGarvie Smith Farm	✓	✓	(neg)	✓	(neg)	1.1 west
C McGarvie Smith Farm	(neg)	(neg)	(neg)	✓	(neg)	1.3 west
D 2140 Elizabeth Dr	✓	✓	(neg)	X	X	1.4 south
E 1745 Elizabeth Dr	✓	✓	✓	(neg)	X	1.2 south
F SE dwelling	(neg)	✓	(neg)	(neg)	X	1.5 south-east
G Caretakers for 1669A Elizabeth Dr	✓	(neg)	X	✓	X	1.1 south-east
H 1669A Elizabeth Dr	✓	✓	X	✓	X	0.8 east

neg = negligible **✓ = visible** **X = not visible**

Note: Where either the temporary stockpiles or SAWT-BIOWISE facility can be seen from only a small part of a residence, or visibility of the SAWT-BIOWISE facility or temporary stockpiles from the residence is screened by vegetation, results are marked as negligible.

The viewshed model has also been used to predict any view of the facility from any particular location. In order that the SAWT-BIOWISE can be clearly seen in **Figure 7.8** to **Figure 7.11**, the buildings have been highlighted in red. It is not the intention to construct buildings of such striking colour, and the appearance and likely colour schemes are discussed below.

Figure 7.8 shows predicted lines of sight for each of the properties considered. Based on current site elevations, it is predicted that whilst properties D, E and F might have a view into the landfill, only Property E will have a view through to the SAWT-BIOWISE facility.

Figure 7.9 shows the predicted view and terrain profile from Property E after construction of the SAWT-BIOWISE facility, during operation of the landfill. The terrain profile indicates that the SAWT-BIOWISE facility will be hidden from view by the landfill and stockpile.

Figure 7.10 updates the predicted line of sight for each of the properties considered at the point when the landfill has been constructed to its approved final landform. The lines of sight for all properties fail to reach the SAWT-BIOWISE facility.

Figure 7.11 shows the predicted view and terrain profile from Property E after the completion of the landfill to approved final landform. The SAWT-BIOWISE is not visible at all, and this confirms the line of sight model from **Figure 7.10**. Indeed, that part of the landfill that is closest to Property E is that which will be constructed to approved final landform soonest, and it is therefore predicted that the visibility of the SAWT-BIOWISE from Property E will not be evident within 5-8 years.

The nearest neighbour at 1669A Elizabeth Drive (labelled H) will have no view of the SAWT-BIOWISE facility during any stage of Landfill operations.

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- Neighbouring Residences**
- A: McGarvie-Smith Farm
 - B: McGarvie-Smith Farm
 - C: McGarvie-Smith Farm
 - D: 2140 Elizabeth Drive
 - E: 1745 Elizabeth Drive
 - F: SE dwelling
 - G: Caretakers - 1669A Eliz. Dr.
 - H: 1669A Elizabeth Drive

➔ Lines of Sight

/// Vegetation Screening



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FIGURE 7.8: Predicted Visibility of SAWT from Residences - Current Landform

Source: NPWS, 2006; SITA, 2006

Figure 7.9: Predicted Visibility from Property E During Landfill Operation



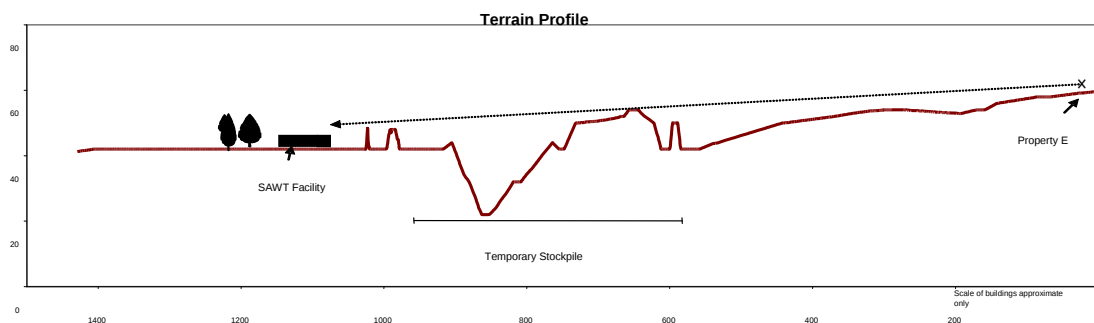
This is the position of Property E and the SAWT-BIOWISE in relation to each other.

The model incorporates the elevations of the site and surrounding area as at December 2005.

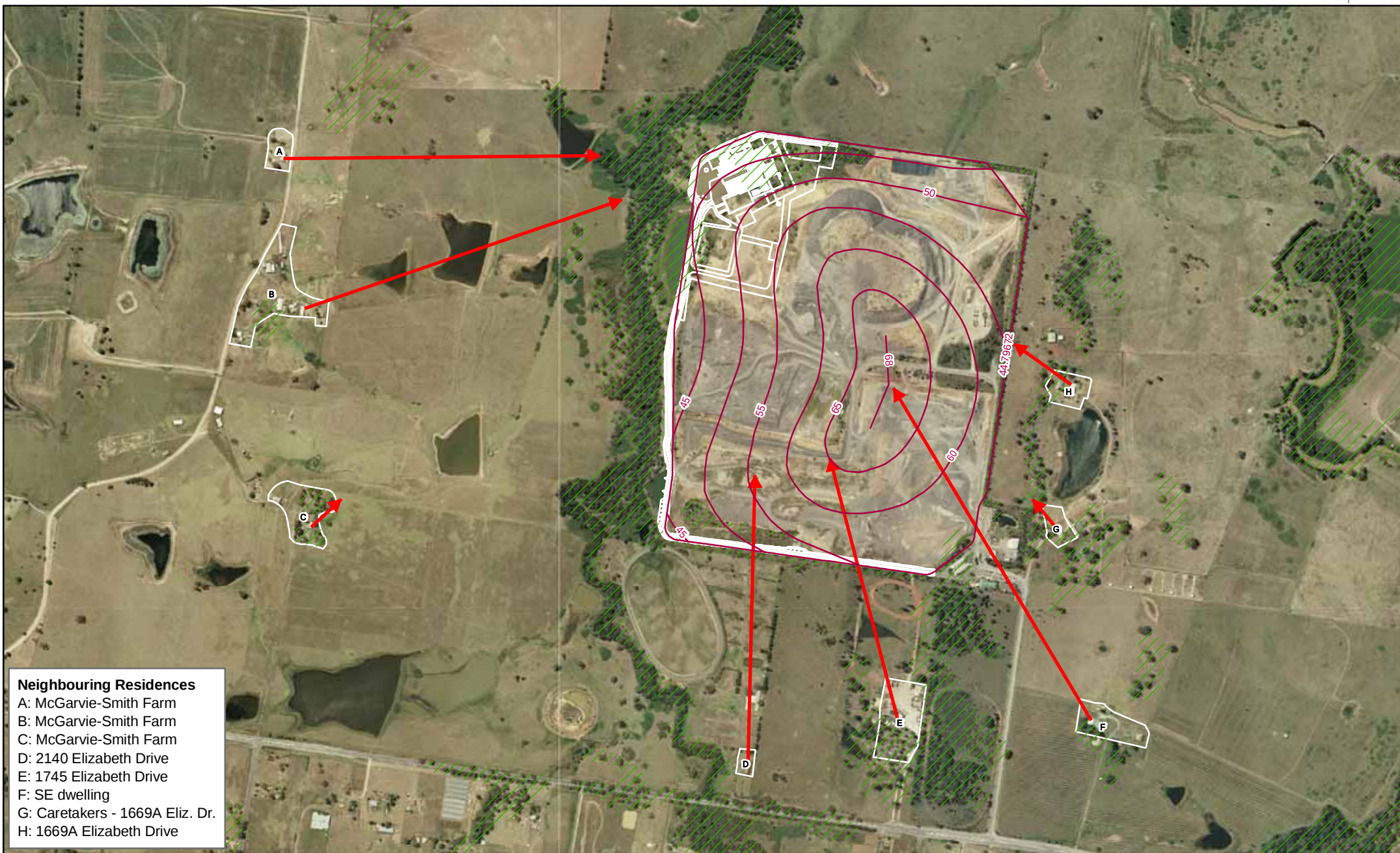


With the current vegetation in place, Property E is surrounded by mature trees. The SAWT-BIOWISE also has a backdrop of mature trees.

This Terrain Profile demonstrates how the SAWT facility will be just visible from Property E. This view is for when the SAWT Facility has been constructed, and is based on the landfill terrain in 2006.



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→ Lines of Sight

/// Vegetation Screening

0 120 240 480 720 960
Metres

Advanced Waste Treatment Facility
Elizabeth Drive

FIGURE 7.10: Predicted Visibility of SAWT from Residences - Final Approved Landform

Source: NPWS, 2006; SITA, 2006

Figure 7.11: Predicted Visibility from Property E after Construction to Approved Final Landform



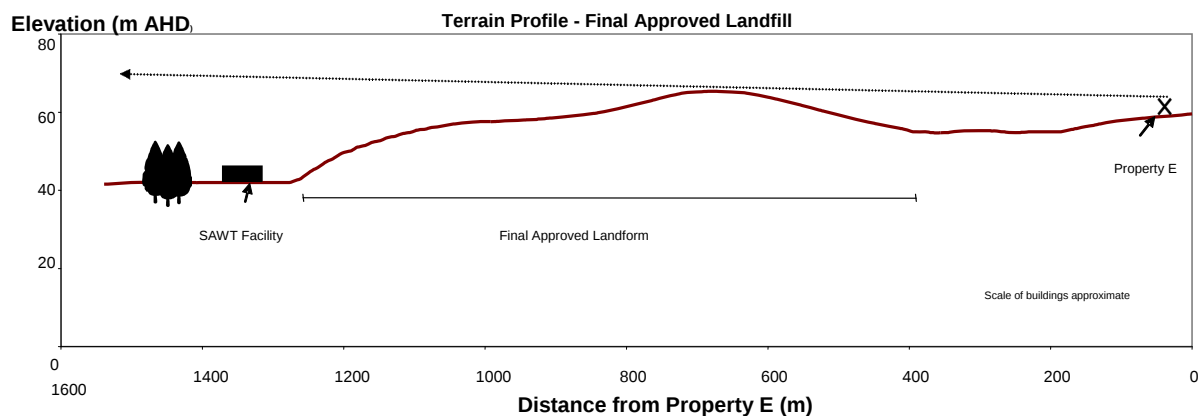
This is the position of Property E and the SAWT-BIOWISE facility in relation to each other.

The model incorporates the elevations of the site and surrounding area as at the approved final landform.



With the current vegetation in place. The SAWT-BIOWISE facility is considerably less visible than before.

This Terrain Profile demonstrates how the view from Property E will change as the Landfill's profile changes from 2006 to completion. As the Landfill will be completed moving from the south to the north, the view from Property E will be obscured by the Final Approved landform by approximately 2015.



Appearance

With regard to appearance, the SAWT-BIOWISE facility will comprise several buildings of functional character including both enclosed sheds and open structures. Appearance impacts are likely to be due to the contrast of these buildings with the surrounding rural landscape and will include the effect of night lighting on buildings and headlights attached to moving equipment.

In assessing the appearance of buildings that will be constructed as part of the SAWT-BIOWISE facility, buildings at a comparable site were evaluated. Photographs in **Figure 7.12** are of SITA's Crobern Facility in Germany and depict buildings of similar size, materials and colour.

Figure 7.12: Building Materials and Structure



The photographs demonstrate the general structure and materials that will be used at the SAWT-BIOWISE facility. The photographs show that although some buildings are large, they are simple in design, natural in colour and do not stand out excessively against the background.

With regard to both visibility and appearance during the night, the SAWT-BIOWISE facility will need security lighting and other operational lighting. Although some waste processing will take place during the early evening, no outdoor operations requiring additional lighting will be conducted at night. Residential dwellings are located sufficiently away from the SAWT-BIOWISE Site so that impacts caused by lighting will be minimal.

7.5.2 Management of Visual Impacts

Potential visual impacts associated with the proposed SAWT-BIOWISE facility are low, due partly to the type of built structure and also due to management and mitigation strategies that SITA will adopt in the detailed design and operation of the SAWT-BIOWISE facility.

To address the visibility of the SAWT-BIOWISE facility, in context with the surrounding landscape, buildings have been designed to sit at an elevation as low as practicable on the SAWT-BIOWISE Site, without compromising flood protection or drainage design.

SITA also proposes to retain as many trees and other vegetation as practicable. This will provide screening for the completed SAWT-BIOWISE facility, and also maintain the semi-rural character of the area. Detailed design will be the opportunity for SITA to integrate the SAWT-BIOWISE facility into the landscape and substantially reduce visual impacts.

At the completion of construction of the SAWT-BIOWISE facility, the surrounding area will be further enhanced with native flora species endemic to the locality. SITA has previously undertaken substantial planting around the perimeter of its Elizabeth Drive Site. The company has an agreement with the property owner north of the Elizabeth Drive Site to increase planting density along their mutual boundary. SITA has made an arrangement with Landcare to assist the company with this and provided funding for the supply of native flora species suitable for the area. Trees currently along the boundary of the future SAWT-BIOWISE Site demonstrate the feasibility of landscaping the SAWT-BIOWISE Site and indicate the height and level of screening of recent plantings when they reach maturity.

Location of new trees and native flora will be complimentary with stormwater drainage design, water storage, water treatment, vehicle movements and Landcare advice. In addition to providing screening for buildings, the vegetation and trees will also act as a buffer to prevailing winds and provide summer shade for buildings.

In addressing the appearance of the SAWT-BIOWISE facility, even though most of the machinery and equipment comprising the SAWT-BIOWISE facility does not need to be housed for its operation, much of it has been enclosed to reduce other impacts such as noise and odour. Enclosing machinery reduces the visual impact of the SAWT-BIOWISE Site.

A further strategy that will be adopted by SITA as mitigation against unacceptable appearance will be the use of building materials that are neutral in colour and blend in with the natural surroundings.

As the location is semi-rural, SITA will take care to minimise the amount of light spill impacting on local fauna. The detailed design team will select suitable security lighting for use around facilities and hardstands. Consideration will be given to use of directional lights that limit light spill. Mobile equipment will be fitted with headlights to be used instead of permanent lighting masts, where feasible.

Buildings and structures will be coloured so as to remain sympathetic to the surrounding semi-rural nature, and the need to have a low visibility impact. Colours used will be earthen tones, similar to the surrounding landscape, and be non-metallic in appearance. Reflective surfaces will be minimised, but balanced with the need for natural light within the building.

7.6 Hazard and Risks

7.6.1 Facility Fire

Fire Risk

Outbreak of fire at composting facilities is a real threat (WMAA, 2004). This can occur through 'hot loads' being delivered to site, generation of heat in the composting process or ignition of combustible material on site. The risk of fire must always be considered for a waste facility.

Mitigation

The following mitigation measures will be used to manage the risk of facility fire:

- Procedures written for the SAWT-BIOWISE facility based on receiving and reporting of 'hot loads';
- Temperature monitoring and control in composting process, buildings and maturation stockpiles;
- Smoking prohibited within the SAWT-BIOWISE facility, composting areas and near equipment maintenance facilities and the use of designated smoking areas;
- Strict controls over welding or other 'hot' works that may produce sparks;
- Facility Evacuation Plan and procedures;
- Reporting of incidents to the Emergency Co-ordinator;
- Adequate provision of water supply in close proximity to the SAWT-BIOWISE facility;
- Fire fighting equipment installed within the SAWT-BIOWISE facility and staff training in its use;
- Having a water cart available on site;
- Contaminants that may be combustible will be stored in metal skip bins, and removed before the bin is full;
- Fuels and flammable solvents stored in appropriately constructed areas, including bunds and spill management equipment; and
- The use of sprinkler systems and fire walls as required by the Building Code of Australia.

7.6.2 Bushfire

Risk

A draft Penrith Bush Fire Risk Management Plan (PBFMP) has been developed for the LGA (Penrith Bush Fire Management Committee, 2005) however bush fire hazard maps are not yet available. Waste disposal sites are identified in the Plan as assets requiring special protection. The bush fire season begins during the period of strong winds in late winter and ends with the onset of summer rains in December. The majority of fires are caused by burning off and incendiarism. Dangerous bushfire seasons occur during periods of drought, persistent winds and prolific fuel from good growing seasons in the previous summer.

The Elizabeth Drive site is largely devoid of vegetation however native vegetation on the Badgerys Creek riparian corridor runs along the western boundary of the site and adjacent to the proposed SAWT-BIOWISE facility. The site is surrounded by pasture.

The dry sclerophyll forest along Badgerys Creek can support high intensity fires and for the purposes of this EA is considered to be a moderate risk. Grassland fires occur when the grass is long and dry. Grassland fires can be intense and fast moving but only persist for a short-time and as such grasslands may be rated as a major risk.

Hazard reduction has occurred in Penrith LGA since 1948 and major wildfires have largely been excluded. The PBFMP lists actions to:

- Reduce hazards;
- Reduce ignitions; and
- Accept residual risk.

The Rural Fires Act 1997 imposes the responsibility of implementing the plan on the owners or occupiers of the land on which the risk occurs. Implementation measures for the SAWT-BIOWISE

facility are described in the following section. Risk management on adjoining properties will be undertaken by the owner/occupiers of those properties.

Mitigation

The following measures will be implemented to prevent bushfire damage to the SAWT-BIOWISE facility or spread of fire to adjoining bushland.

- Reduce Hazards:
 - Maintenance of a buffer firebreak zone between built structures and natural vegetation surrounding the Elizabeth drive site.
- Reduce Ignitions:
 - Smoking prohibited within the SAWT-BIOWISE facility, composting areas and near equipment maintenance facilities; and
 - Strict controls on activities likely to generate sparks (e.g. welding).
- Accept Residual Risk:
 - Adequate provision of water supply in close proximity to the SAWT-BIOWISE facility. The SAWT-BIOWISE facility is a net user of water and as such a supply of water will always be maintained;
 - Fire fighting equipment installed within the SAWT-BIOWISE facility;
 - Water cart available for fire fighting;
 - Inform staff when extreme fire danger conditions exist;
 - Monitoring and recording of extreme fire danger conditions and fire bans;
 - Reporting of bushfire incidents to Emergency Co-ordinator; and
 - Provide training for all staff on fire safety, the use of fire-fighting equipment and evacuation.

7.6.3 Potentially Hazardous Materials

SEPP 33 defines potentially 'hazardous' industry as "industry where if no mitigation measures were taken, would pose a significant risk in relation to the locality". A classification of the proposed SAWT-BIOWISE facility was undertaken by applying the process detailed in Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (DUAP 1997). This guide indicates that if a development can be classified as "potentially hazardous development", then a "preliminary hazard analysis" is required as part of the EA.

To assess whether a development is a 'potentially hazardous industry' and could present a hazard potential to people, property or the environment, DoP (formerly DUAP) proposes a risk screening method which is based upon the class, quantity and location of all dangerous goods to be brought to a site as a result of the proposed development and any potential impact that these goods could have.

The proposed SAWT-BIOWISE facility is intended to receive solid waste only, originating from municipal (e.g. waste that most households place in their rubbish bins) and C&I sources. It is prudent to consider that waste to be received at the Elizabeth Drive Site can contain a tiny fraction of potentially hazardous materials collected primarily from the typical household, usually in the form of residual cleaning products. However this percentage is extremely small and well below the dangerous goods storage thresholds identified in the DoP screening method.

Other potentially hazardous materials are hazardous and dangerous goods, which will be brought to the Site. These will consist of materials for cleaning and vehicle maintenance.

Any dangerous goods expected to be received and/or stored on the site would include the following:

Figure 7.13: Dangerous Goods Expected to be Received and/or Stored on Site

Class Dangerous & Hazardous Goods	Description	Quantity
Class 1	Explosives	None.
Class 2	Gases	Up to around 20 empty or near empty LPG bottles removed from the waste stream stored on site at any one time.
Class 3	Flammable liquids	- Petrol – small quantities, up to 20 litres for use in landscape maintenance equipment such as whipper snippers. - Diesel – approximately 10000 litres for use in site vehicles.
Class 5	Oxidising agents and organic peroxides	None or possibly less than 5 litre containers of cleaning fluids.
Class 6	Poisonous (Toxic) and infectious substances	Pesticides and herbicides (less than 5 litre containers).
Class 7	Radioactive substances	None.
Class 8	Corrosive Substances	Less than 5-litre containers of cleaning / maintenance fluids, petrol, chemicals.
Class 9	Miscellaneous dangerous goods	- Small quantities of oil and water based paints less than 20 litres per container. - Car batteries removed from the waste stream less than 20 litre containers. - Oils (Automotive) 5-20 litre containers. - Computer and television screens. - Adhesives (less than 20 litre containers).

Following is a description of the potentially hazardous materials which may be on site as well as details of the management and mitigation measures to be implemented.

Diesel

Diesel will be stored on site for use in on site vehicles, such as loaders. The quantity will be approximately 10000 litres and will be stored in a tank with associated fittings and pipelines designed to comply with Australian Standard AS 1940:2004 (Storage and Handling of Flammable and Combustible Liquids). The tank would be contained within a bunded area which would not be linked to any other part of the site. The bund would have the capacity of 110% of the tank capacity.

Under SEPP 33, diesel is categorised as Class C1 Flammable Liquid. As the tank for diesel will be contained within its own bund and be kept separate from other materials, SEPP 33 states that the diesel is not considered to be potentially hazardous.

Other Materials

The total quantity of any of the other materials temporarily stored on site would be less than 1m³, an amount easily stored on a standard pallet, prior to collection and removal by an appropriately licensed contractor. These materials are also anticipated to be below the SEPP 33 screening thresholds and will be stored normally in accordance with the dangerous goods regulations.

With the exception of the diesel, materials will not be accepted into the Facility as discreet loads but rather, will be received as contaminants manually removed from the mixed solid waste stream during the resource recovery process.

SITA would comply with WorkCover NSW's 'Notification of Dangerous Goods on Premises Guide GDG01' and 'Storage and Handling of Dangerous Goods on Premises Code of Practice 2005.' This Guide and Code of Practice would be used to ensure the material was delivered, stored and handled appropriately, and that any required response to incidents was in place. Relevant spill kits and other containment resources as required will be put in place at the SAWT-BIOWISE facility.

The proposed SAWT-BIOWISE facility is therefore not considered to be potentially hazardous in accordance with SEPP 33.

7.7 Health

7.7.1 Existing Environment

Compost produced for various end uses is required to meet criteria under AS 4454 (Standards Australia 2003) to meet objectives (among others) to protect public health.

Requirements for worker health and safety at both the existing Landfill operations and the proposed SAWT facility are defined under the *Occupational Health and Safety Act 2000*.

7.7.2 Potential Impacts

Waste materials used as feedstock for composting at the proposed SAWT facility have the potential to pose a minor threat to human and animal health due to the potential presence of pathogens. Pathogens are organisms such as bacteria, viruses, fungi and protozoa capable of producing an infection or disease in a susceptible host. Pathogens can be present in mixed waste, in yard trimmings and in biosolids. If not destroyed or rendered inactive, pathogenic organisms could potentially be an occupational health issue or a public health concern if either SAWT facility workers come into direct contact with waste, or workers and end users come into direct contact with compost product.

The SAWT-BIOWISE Process

Waste feedstock materials will be subjected to sorting, composting and maturation processes as described in **Section 4**. These processes will be undertaken in order to meet the requirements of AS 4454 (Standards Australia 2003). This standard has strict guidelines on process quality with respect to pathogens.

High temperatures that characterise the active composting phase are necessary to destroy pathogens in the waste received. A minimum temperature of 55°C has been proven to inactivate parasites, which are the most heat-resistant of the primary pathogens. This temperature is also sufficient to destroy most weed seeds. Pathogens are also destroyed through natural competition among species and predation between species within the composting pile (Natural Resource, Agriculture and Engineering Services, New York, 1994).

Careful temperature control is necessary however, as too high a temperature can immobilise many of the beneficial micro-organisms needed for decomposition.

Control of pathogens in the process will take place during aerobic composting which will occur in two stages, these being:

- Active composting taking place within the composting tunnels and biocells; and
- Curing occurring on the Maturation pad.

Active Composting

Proper decomposition and pathogen control will be controlled within the process by the constant monitoring of temperature and oxygen content within composting mass in each composting tunnel and biocell. Temperature and oxygen content will be recorded on a Temperature/Oxygen profile Report form. From the BioWise operation, SITA has sufficient operational data, such that after monitoring and review of the Temperature/Oxygen profile Report form, the temperatures will be kept at or above 55°C by the adjustment of airflow to control the composting rate. Adjustment of airflow can be controlled by either/both the air intake or/and air extraction capacity for each tunnel or biocell.

Temperature will also be controlled by the monitoring and control of moisture content within the composting materials. Moisture will be monitored and the addition rate of water/leachate will be controlled to maintain the required moisture content, which in turn will promote the composting process and maintain the required temperature.

The contents of each tunnel and biocell will be turned regularly to ensure thorough mixing and hence composting of all material.

Curing

The maturation process that follows the active composting is characterised by slower rates of decomposition and declining pile temperatures.

The time and temperature relationships for the materials during maturation will also be monitored and documented to manage this. Moisture will also be added as necessary to control temperatures during the maturation stage.

As a result of the management of both stages, composted products will be free of plant pathogens, bacteria harmful to humans or animals, and plant propagules that otherwise would allow the spread of plants, particularly weeds.

These processes are also sufficient to destroy pathogens in leachate. All composting will take place within fully-enclosed buildings and therefore stormwater will not contact the material undergoing composting. During maturation, runoff from the maturation area, whilst treated as 'leachate' will not contain pathogens since they would have been destroyed during composting.

7.7.3 Management of Impacts

Potential health risks associated with the proposed SAWT–BIOWISE facility will be managed by the following methods:

- The SAWT process itself;
- Implementation of appropriate workplace, health and safety procedures; and

- Management of transportation.

Workplace Health and Safety Procedures

The processes carried out within the Receival Building, Mechanical Separation Building and composting and Biocell area results in a product that is safe to handle. Nevertheless, until the material has left the composting tunnels and biocells, the risk remains of a potential for transfer of pathogens and bacteria that are harmful to humans or animals.

Accordingly, new workplace health and safety procedures will be incorporated into the design of the mechanical and handling process so as to minimise these risks to workers in the SAWT-BIOWISE facility and drivers of vehicles delivering waste to, or removing compost and recyclables from, the facility. Relevant design considerations include:

- Mechanical waste handling equipment, such as front-end loaders, will be provided in the Receival Building, the Resource Recovery Building, and for processes associated with the composting tunnels and biocells and the Maturation Pad. The loaders will have air-conditioned cabins that provide filtered air to the driver;
- Biosolids would be discharged directly into a sealed tank to avoid human contact;
- Provision of specifically-designed air-conditioned rooms that incorporate air-conditioned ducting systems to provide fresh air for workers in the Manual Recovery Room and Quality Check Room located within the Resource Recovery Building; and
- Conveyors designed to minimise heavy lifting and associated strain injuries or other movements that could result in workers getting too close to waste feedstock.

A high level of plant hygiene is required to prevent incidents associated with all forms of bacteria and pathogens. Accordingly, a number of workplace, health and safety procedures will be added to the SITA Health and Safety Management System. The new procedures will be put in place to minimise risks to the workers from the material arriving at the proposed facility. These procedures will include:

- Staff training prior to the commencement of work under workforce supervision;
- Use of gloves by all workers at all times to avoid transferring material and potentially pathogenic material from hand to mouth;
- Compulsory use of washing facilities prior to meal breaks and before leaving the SAWT Site;
- Use of facemasks as necessary by staff when working outside rooms with forced ventilation and air-conditioned mobile plant machinery cabins;
- Use of protective clothing such as overalls;
- Worker health checks and monitoring;
- Safe work procedures; and
- Hearing protection in certain areas of the facility, as required.

Vector Control

Nuisance animals such as feral cats, rats and birds can potentially spread disease to humans and other animals. As such it is critical that nuisance animals are controlled. To prevent access by nuisance animals:

- The entire process of receival, sorting and composting will take place in fully-enclosed buildings; and
- The site will be securely fenced.

Management of Transportation

Transportation of waste to the facility will generally occur in enclosed vehicles. This is the currently used methodology for most waste collection services and complies with both DECC and RTA transportation requirements. This will avoid leakage and spillage onto roads and hence any potential health risks associated with the public coming in contact with material being delivered to the facility.

Appropriate authorisation from NSW Agriculture will be obtained if there is potential for grape vine material to enter the waste stream, in regard to transfer of waste to *Phylloxera* exclusion zones to the Site.

Compost and recyclables exiting the facility will be transported in vehicles that comply with RTA requirements and will generally be in the type of vehicles usually associated with this form of transport.