A REPORT BY ENVIROS CONSULTING LIMITED: APRIL 2005

EAST MIDLANDS REGIONAL ASSEMBLY

PHASE 1: TREATMENT CAPACITY SURVEY

EXECUTIVE SUMMARY

1. INTRODUCTION

In April 2004, the East Midlands Region Assembly commissioned Enviros Consulting Ltd to undertake a study into the current and future waste treatment capacity of the East Midlands Region.

The objectives of this study were to:

- Establish the number, location and capacity of existing waste treatment facilities; and
- Establish the scale and location of facilities that could be required in the region to manage waste as a result of current and future legislation, targets and waste growth.

The following report covers the first objective, relating to the survey of waste treatment facilities.

2. SURVEY BOUNDARIES

The East Midlands Regional Assembly already had a good understanding of waste arisings and capacity for waste disposal (landfill) within the region. To enable the regional assembly to move forward with its strategy, a definition of the term "waste treatment" was adopted that excluded landfill sites and transfer stations.

For the purposes of this survey waste treatment facilities will be defined as:

> Any facility (licensed, permitted or exempt) that accepts the waste for the primary or secondary purpose of processing (using physical, thermal or chemical means); and whose purpose is to reduce the mass of the waste, the hazardous nature of the waste, facilitate handling or enhance recovery.

The working definition of treatment will specifically excludes bulking and transfer facilities that do not undertake any other type of treatment.

3. FACILITY DATABASE

The facility database has been developed in three major stages:

- Developing an initial dataset;
- Refining the initial dataset; and
- Site database verification.

Further refinement of the dataset was undertaken as the surveying process was carried out because it was possible to identify sites that are not longer operational and those that have moved or no longer carry out waste management processes.

4. QUESTIONNAIRE DEVELOPMENT

The questionnaire used in the survey was developed over a number of stages:

- Drafting
- Pilots - the questionnaire was piloted to six major waste management sites run by Biffa Waste Services Ltd.
- Final version - the final questionnaire was circulated to the steering group on 15th June 2004.

5. SURVEY

The number of sites identified within the East Midlands meant that not all could be surveyed. A sampling methodology was developed to:

- Ensure that high priority sites were surveyed; and
- Ensure that as representative a sample as possible of moderate/low priority sites were sampled.
- Site visits were undertaken where deemed necessary - one site visit was undertaken to Castle Cement in Ketton.

6. RESPONSE AND DATA ANAYLYSIS

In total 500 surveys were dispatched (including pilots), the surveys were targeted at sites that were considered important to the waste treatment capacity of the East Midland region.

Overall a response was received from 309 of the sites surveyed; this represents 61.8% of the survey dataset. More than 30% of the respondents (157) claimed they were undertaking activities that were not relevant to the survey, this included those that were outside the survey area once more location details were obtained, sites that were no longer operating or were no longer using the license. Predominantly sites no longer relevant to the survey were the exempt and Part B licensed sites. The “not relevant“ population represented 40% of the exempt and Part B sites surveyed (137 sites out of 349 Exempt and Part B sites surveyed).

71 (14%) completed survey responses were received. Four of the responses received were for sites that are not operational at present, but are currently in the planning, building and commissioning phases

Initial review of the data provided by respondents showed that 61 surveys (12.2% of the total sample) contained data that could be used in the analysis of current treatment capacity.

A significant number of the survey sample, 81 representing 16.2% of the survey population declined to support the survey.

6.1 Analysis of results

Data collect from the survey was supplemented by data from some licensed sites that was provided by the Environment Agency from its RATS database (Regis (Regulation Information System (database of licensed sites for waste)) Appended Tonnage System).

The term capacity used in this survey can have a range of different meanings:

- Maximum capacity on the waste management licence;
- Maximum capacity of plant and equipment on site;
- Current throughput of the site.

Wherever possible, data on maximum capacity of plant and equipment has been used, however Environment Agency data used was on throughput based on quarterly returns from licensed sites.

6.2 Statistics & scaling up

The design capacity data provided by the survey was used wherever possible and where this was not available throughput capacity data from the survey has been used, supplemented with Environment Agency data on throughput where possible.

Wherever possible this “actual” data was used to scale up the capacity figure to provide a total waste treatment capacity for the region. A two stage approach was used:

- To estimate a minimum capacity for non-responding/ not surveyed sites.
- To estimate a maximum capacity for non-responding/not surveyed sites.

It was necessary to reflect the “no longer operating” response from 40% of the exempt and Part B processes contacted during the survey. Therefore the capacity that was estimated for the exempt/Part B population that did not respond or that wasn’t surveyed has been reduced by 40% to provide a more accurate reflection of the situation that was identified during the survey.

6.3 Commentary on quality of data

The ability to undertake all the tasks outlined in the tender was hampered by the quality of the response to the survey. In order to establish the current status of waste treatment in the East Midlands it was necessary to supplement the survey data with data from the Environment Agency, where it was available, to provide sufficient information to estimate total capacity for facilities operating under waste management licenses for the region.

Insufficient data was available from the survey to establish any useful information on the theoretical versus the practical capacity of the facilities operating, the ability of facilities to operate different processes or the operational lifespan of facilities. Some facilities provided detail on future plans to expand their operations; however detail was only available on short-term plans to change capacity.

7. WASTE TREATMENT CAPACITY IN THE EAST MIDLANDS

7.1 Incineration

The types of facilities operating that are included within this category are incinerators licensed under Pollution Prevention Control Regulations, Waste

Management Licenses (WML) classed as A18 incinerator processes or Part B combustion processes.

The survey identified four incineration operations in the East Midlands.

The total incineration capacity of the East Midlands is shown in Table 1.

Confidence in the data: data for three of the facilities was provided by the Environment Agency, the calculated data represents 3% of the total capacity. Therefore the confidence in this data is high.

Table 1 Incineration capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence
PPC Permit	1	**167,000**	**±5,000 tonnes ±3%**
WML	2		
Part B process	1		
Total capacity in region	**4**		

It is understood that energy is recovered from all the incinerators operating in the East Midlands, no quantity data was collected.

No sites report any plans to expand their capacity in the future and no new facilities that have applied to be licensed were identified.

7.2 Incineration facilities handling Clinical and Hazardous waste

The types of facilities operating that are included within this category are clinical waste incinerators operating under WML and as Part B processes (Other(clinical) and those facilities also classed as Other(hazardous) under Pollution Prevention Control Regulations undertaking the reclamation of metals and/or metal compounds by heating.

The survey identified five incineration facilities that are handling clinical and hazardous waste.

The total capacity of these facilities in the East Midlands is shown in Table 2. All the data has been provided by survey respondents or the Environment Agency the confidence in the data is high.

Energy is recovered from both clinical waste incinerators that are in operation in the East Midlands, no quantity data was collected.

Table 2 Capacity for handling clinical and hazardous waste, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)
PPC Permit	3	**158,000**
WML	1	
Part B process	1	
Total capacity in region	**5**	

One site reported plans to upgrade equipment to treat waste more effectively, no sites report any plans to expand their capacity in the future and no new facilities that have applied to be licensed were identified.

7.3 Materials Recovery Facilities

The types of facilities operating that are included within this category are licensed under WML as A15 - Material Recycling Treatment Facilities.

Fifteen materials recovery facilities were identified as currently operating by the survey. All sites operated under WMLs.

A material recovery the capacity of the region is estimated as 227,000 ±46,700 tonnes (21%).

The confidence in the estimated WML treatment capacity is high as it is mainly based on ”actual” data and using a conservative estimation for the capacity of the non-responding sites.

One of the operational sites responding to the survey reported plans to expand their capacity in the future. In addition one facility that is developed, but not yet operational was identified it has been labelled a Material Recycling Facility, but is also undertaking operations that could be classed as physical treatment and composting.

7.4 Chemical Treatment

The types of facilities operating that are included within this category are licensed under WML as A21 - Chemical Treatment Facility.

Only one chemical treatment facility was identified from the survey operating under a waste management license. The Environment Agency provided throughput data on the site operating in the region, the quantity reported was negligible.

7.5 Physiochemical Treatment

The types of facilities operating that are included within this category are licensed under WML as A17 - Physico-Chemical Treatment Facility or Special Physico-chemical treatment (D9) and facilities classed as Other(hazardous) facilities operating under WMLs for example undertaking the regeneration of acids or bases (R6). The types of activities being undertaken by this category of facility are waste oil recovery, oil / water separation, material solidification and recycling of fluorescent tubes and lamps.

The survey identified 13 physio-chemical treatment sites operating in the East Midlands.

The total physiochemical treatment capacity for the East Midlands is shown in Table 3.

The confidence in the WML treatment capacity is high as it is mainly based on actual data and using a conservatively estimated range for the capacity of the non-responding sites.

Table 3 Physiochemical treatment capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence
PPC Permit	1	**226,400**	**±13,200 tonnes ±6%**
WML	12		
Total capacity in region	**11**		

This sector covers a wide variety of operations from oil such as blending, separation and other forms of recovery to material solidification and fluorescent tube processing. Only limited data was provided by respondents on waste types processed. From the data provided the waste processed by these facilities is classified as EWC 06 - wastes from inorganic chemical processes, EWC 13 - oil wastes and wastes of liquid fuels, EWC 16 - wastes not otherwise specified & EWC 19 - wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use.

One site reported plans to expand their capacity in the future. No new facilities that have applied to be licensed were identified.

7.6 Composting

The types of facilities operating that are included within this category are licensed under WML as A22 - Composting Facility, classed as exemptions under clauses 12(1) - Composting of biodegradable waste, 21(1) - Processing waste plant matter and facilities processing animal and vegetable matter. Whilst the majority of sites appear to undertake their composting in windrows, two respondents reported undertaking in-vessel composting.

The survey work identified 147 composting sites in the East Midlands.

To estimate the total tonnage for exempt composters in the region a realistic range of treatment capacity waste estimated based on The Waste Management Licensing Regulation 1994 and expert knowledge. The capacity figures for exempt capacity were reduced by 40% to reflect the “no longer operating” responses from the survey. All figures shown in this report for exempt composting capacity have been reduced by 40% to reflect this no longer operating capacity.

The total capacity for composting facilities in the East Midlands is shown in Table 4.

Table 4 Composting capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence (T/A) %	Future additional planned capacity (T/A)	Confidence (T/A) %
WML	7	**371,100**	**137,000 ±36.9%**	**103,100**	**±12,200 12%**
Exemptions	140				
Total capacity in region	**147**				

The confidence in the WML treatment capacity is high as it is mainly based on “actual” data and using a conservative estimation for the capacity of the non-

responding sites. However confidence in the capacity of the exempt sites is low as it is based on two assumptions, firstly the average capacity of each site and secondly the number of site presumed to be operating. Caution should be exercised when using this data to estimate future capacity requirements.

Only limited data was provided by respondents on waste types processed. from the data provided the waste processed by these facilities is classified as EWC 02 - wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing or EWC 20 02 - garden and park wastes (including cemetery waste).

Four respondents currently operating claimed to be planning to increase capacity over the next year. In addition, five facilities that are planned, of which one is developed but not yet operational and four are yet to be developed.

7.7 Metal Recycling Facilities

The types of facilities operating that are included within this category are:

- Licensed under WMLs as:
  - A19 - Metal Recycling Site (Vehicle Dismantler)
  - A19a - ELV Facility
  - A20 - Metal Recycling Site (mixed MRS's)
- Under exemption paragraphs:
  - 45(1) - Recovery of waste from scrap metal/motor vehicles
  - 45(2) - Storage of waste where scrap metal recovery takes place
  - 45(5) - Temporary storage of non-scrap waste, pending collection
- Part B processes described as “metals, non ferrous metal from scrap”.

The survey identified 296 metal recycling sites operating in the East Midlands. Of the 115 licensed sites 53 are operating as A20 - Metal Recycling Sites (mixed MRS's), 52 as A19 - Metal Recycling Sites (Vehicle Dismantlers), eight as A19a - ELV Facilities and two provide no details.

The confidence in the WML treatment capacity is medium as it is based on actual data from 27 out of the 115 WML sites and using a conservatively estimated range for the capacity of the non-responding sites. Whilst confidence in the capacity of the exempt and Part B sites is low as it is based on two assumptions, firstly the average capacity of each site and secondly the number of site presumed to be operating. Caution should be exercised when using this data to estimate future capacity requirements.

All figures shown in this report for exempt and Part B metal recycling capacity have been reduced by 40% to reflect the no longer operating capacity.

The total capacity of metal processing facilities in the East Midlands is shown in Table 5.

Table 5 Metal recycling capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence (T/A) %	Future additional planned capacity (T/A)	Confidence (T/A) %
WML	115	**5,618,600**	**± 967,700 17%**	**141,500**	**±32,000 23%**
Part B processes	1				
Exemptions	180				
Total capacity in region	**296**				

Only limited data was provided by respondents on waste types processed. From the data provided the waste processed by these facilities is classified as EWC 16 - wastes not otherwise specified in the list.

One operator responding to the survey responsible for several sites in the region reported the intention to expand their capacity in the future. In addition, eight facilities that are developed, but not yet operational were identified. Of these facilities that have applied to be licensed three are for WML sites and five for exempt sites.

7.8 Physical Treatment Facilities

The types of facilities operating that are included within this category are physical treatment facilities operating under WML or PPC Permits classed as A16 - Physical Treatment Facility. The facilities classified as physical treatment operating appear to undertake a range of activities including soil screening, concrete crushing, wood chipping, plastic processing and composting. The main issue with the physical treatment capacity is the possible overlap with other treatment facilities such as wood and construction and demolition waste.

The survey identified 22 physical treatment processors operating in the East Midlands.

The confidence in the WML treatment capacity is high as it is based on actual data and using a conservatively estimated range for the capacity of the non-responding sites.

Total physical treatment capacity for the region is shown in Table 6.

Table 6 Physical treatment capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence (T/A) %	Future additional planned capacity (T/A)
PPC permitted	1	**1,412,200**	**± 124,500 8.8%**	**75,000**
WML	21			
Total capacity in region	**22**			

Only limited data was provided by respondents on waste types processed. From the data provided the waste processed by these facilities is classified as EWC 19 - wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use and EWC 17 - construction and demolition wastes (including excavated soil from contaminated sites).

One facility that is developed but not yet operational was also identified.

7.9 Construction and Demolition Waste

The types of facilities operating that are included within this category are facilities that are primarily processing soil and crushing concrete either under a WML, an exemption or as a Part B. The facilities may process and may be undertaking some wood chipping, plastic processing and composting. The exemption paragraphs the faculties are operating under are the following:

- 13(1) - Manufacture of products from waste,
- 13(2) - Manufacture of soil / soil substitutes,
- 13(3) - Treatment of waste soil, rock for spreading on land,
- 13(4) - Storage of waste for manufacture of soil etc.,
- 24(1) - Crushing waste bricks etc at place of production,
- 24(2) - Crushing waste bricks etc not at place produced,
- Crushing & screening processes, mobile crushing.

From the survey a total of 159 sites were identified that process construction and demolition waste (C&D waste). One operating under a WML, 123 sites were exempt sites, 35 operating as Part B. As part of the survey these were split into four categories to identify more clearly the different types of processing that were being undertaken. These were:

- Soil Screening
- Concrete Crushing
- Soil Screening & Concrete Crushing
- Soil Screening, Concrete Crushing & Composting
- To estimate the total tonnage for the exempt and the Part B C&D waste processors in the region a realistic range of treatment capacity waste estimated based on The Waste Management Licensing Regulations 1994, expert knowledge and reference to the surveys undertaken for the Office of the Deputy Prime Minister (ODPM) by Symonds[1] in the first half of 2002.

1 Survey of Arisings and Use of Construction, Demolition and Excavation Waste as Aggregate in England in 2003, Capita Symonds Ltd, October 2004

The capacity for the exempt and Part B facilities was reduced by 40% to reflect the "no longer operating" responses from the survey.

As there is only one WML site and it provided data confidence in its treatment capacity is high as it is based on real data. However the confidence in the capacity of the exempt sites is low as it is based on two assumptions, firstly the range of capacity of each site and secondly the number of sites presumed to be operating. Caution should be exercised when using this data to estimate future capacity requirements.

The total capacity of C&D waste facilities in the East Midlands is shown in Table 7.

Table 7 C&D waste capacity, tonnes per annum in 2004

Facility Type	Type of License	Number of facilities	Capacity (T/A)	Confidence (T/A) %
Soil Screening	Exempt	59	**2,436,900**	**±859,800 35%**
Concrete Crushing	Part B	35		
	Exempt	32		
Soil Screening & Concrete Crushing	Exempt	28		
Soil Screening, Concrete Crushing & Composting	WML	1		
	Exempt	4		
Total		**159**		

One facility which was registered as a Part B concrete crusher, that is developed, but not yet operational, was identified.

7.10 Wood

The types of facilities operating that are included within this category are physical treatment facilities operating under WML classed as A16 - Physical Treatment Facility that are particularly processing wood, sites that are listed as accredited re-processors for wood and sites that are licensed as Part B processes classed as Wood/timber processing/working/coating undertaking wood chipping activities.

The survey work identified 4 wood processing sites in the East Midlands.

The confidence in the total wood treatment capacity is medium as it is based on two "real" data points and two points estimated and using the WML data provided to estimate the capacity of the non-responding sites.

The total wood processing capacity estimated for the region is shown in Table 8.

Table 8 Wood processing capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)
WML	**4**	**64,000**
Part B		

Total capacity in region		

Only limited data was provided by respondents on waste types processed. From the data provided the waste processed by these facilities is classified as EWC 03 - wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard or EWC 20 01 38 - wood other than that mentioned in 20 01 37.

No sites report any plans to expand their capacity in the future and no new facilities that have applied to be licensed were identified.

7.11 Other waste treatment facilities

The types of facilities operating that are included within this category are facilities that are primarily exempt or Part B processes with some licensed under WML. The exemption paragraphs the facilities are operating under are the following:

- Other (11) under paragraph 11 - Recovery for reuse of recyclables
- Other (fuel) under paragraphs:
  - 3(a)1 - Burning of straw, poultry litter or wood for fuel
  - 3(a)2 - Burning of waste oil for fuel
  - 3(a)3 - Burning of solid fuel from waste
  - 3(d) - Burning / processing of tyres for fuel
- Other biological:
  - A23 - Biological Treatment Facility
  - Animal and Plant treatment

7.11.1 Other (11) - Recovery for reuse of recyclables

The survey identified 112 sites operating as Other (11), one had a WML and the other 111 were operating under an exemption.

The confidence in the total Other (11) activities is low as it is based on two ”actual” data points and 110 estimated points based on two assumptions, firstly the capacity of each site and secondly the number of site presumed to be operating. Caution should be exercised when using this data to estimate future capacity requirements.

The Total Other (11) capacity in the East Midland is shown in Table 9.

Table 9 Other (11) processing capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)	Confidence (T/A) %
WML	1	**925,900**	**± 59,400 7%**
Exempt	111		

Total capacity in region	**112**		

No data was provided by respondents on waste types processed.

Six facilities that are registered as Other (11) processes that are not yet developed were identified.

7.11.2 Other (fuel) - Burning of waste oil for fuel

The survey identified 35 operating in the East Midlands region.

Total other (fuel) treatment capacity is shown in Table 10.

Table 10 Other (fuel) processing capacity, tonnes per annum in 2004

Method of Licensing	Number of facilities	Capacity (T/A)
PPC Part A Process	1	
WML	1	
Part B Process	19	**122,000**
Exempt	14	
Total capacity in region	**35**	

The confidence in the total other (fuel) Part A and WML activities is high as it is based on two ”actual” data points, however the confidence in the Part B and exempt capacity is low as it is based on 33 estimated points and on two assumptions, firstly a reasonable capacity of each site and secondly the number of site presumed to be operating. Caution should be exercised when using this data to estimate future capacity requirements.

No data was provided by respondents on waste types processed.

One facility that is registered as an exemption other (fuel) process that is not yet developed was identified.

7.11.3 Other (biological treatment) - Biological Treatment Facility

The survey identified 4 biological treatment facilities operating in the East Midlands region three under a WML and one as a Part B processor. Survey data on capacity was collected from all the four facilities. Confidence in the data is high as it was provided by the facilities.

Total other (biological) treatment capacity was estimated as 647,000 tonnes per annum for the East Midlands region.

Two sites report plans to change their capacity, one to increase capacity and one to reduce capacity because changes in the legislation that mean the waste now goes to landfill. No new facilities that have applied to be licensed were identified.

All waste processed were categorised as EWC 02 02 - wastes from the preparation and processing of meat, fish and other foods of animal origin.

7.11.4 Other (not known)

Two facilities were identified through the surveyed that were classified as Other Part B processes. The sites were originally identified based on local knowledge; whilst these sites returned their survey forms they declined to provide further licensing information.

Based on the information provided it is estimated that these sites represent minor operations with a negligible treatment capacity.

7.12 Total Treatment Capacity

In total the current treatment capacity in the East Midlands is estimated to be 12,376,100 tonnes per annum provided by 819 facilities of which:

- 7 are Part A processes under PPC regulations;,
- 183 operate under WML;
- 61 are Part B processes; and
- 568 are carried out under exemptions from WML.

The estimated treatment capacity by method of licensing is shown in Table 11.

Table 11 Treatment capacity by licensing method, 2004

Method of licensing	Minimum capacity	Average capacity	Maximum capacity
	Tonnes per annum		
Part A processes	442,500	442,500	442,500
WML	7,741,000	8,744,000	9,747,000
Exemptions	1,667,100	2,666,600	5,081,000
Part B	317,000	523,000	1,135,000
Total	**10,167,600**	**12,376,100**	**16,405,500**

From the survey it is estimated that approximately 40% of the exempt and Part B processes are not operational thereby reducing the total estimated number of operational facilities to about 400. All the capacity figures for exempt and Part B processes and the total capacity shown above have been reduced by 40% to show this finding.

A significant proportion of this capacity consists is estimated treatment capacity for exempt and Part B processes such as metal processing, soil screening and concrete crushing which represents more than 3 million tonnes of this capacity.

From the data collected an estimated 23 waste facilities are planned and six existing facilities provided accurate information on their plans to expand and one on its plans to reduce capacity. The estimated total future planned capacity in the East Midlands is 512,700 tonnes per annum.

See Table 12 for a summary of facilities and their current and planned waste treatment capacity.

Table 12 Summary of number and capacity of operations by facility types, 2004

Facility type	Current number of facilities	Current treatment capacity (T/A)	Maximum Capacity Estimated (T/A)	Minimum Capacity Estimated (T/A)	Confidence %	Planned future facilities	Additional planned Future capacity (T/A)
Incineration (energy recovery)	4	167,000	167,000	167,000	±5,000 3%	0	-
Other incineration (clinical & hazardous)	5	158,000	158,000	158,000	-	0	-
Materials Recovery Facility	15	227,000	273,800	180,400	±46,700 21%	1	270,000
Chemical Treatment	1	0	0	0		0	-
Physio-Chemical	13	226,400	239,500	213,200	±13,200 6%	0	-
Composting	147	371,100	632,600	234,700	±137,000 36.9%	5	103,100 ± 12,200
Physical Treatment	22	1,412,200	1,536,700	1,287,800	±124,500 8.8%	1	75,000
Soil Screening & Concrete Crushing& Composting	159	2,436,900	4,670,100	1,577,100	±859,800 35%	1	20,000
Wood	4	64,000	64,000	64,000	-	0	0
Metal	296	5,618,600	6,744,700	4,650,900	±967,700 17%	8	118,000 ± 7,500
Other (11)	112	925,900	1,150,100	866,500	±59,400 7%	6	5,400
Other (fuel)	35	122,000	122,000	121,000	-	1	0
Other (biological treatment)	4	647,000	647,000	647,000	-	0	- 79,000
Other (not known)	2	0	0	0	-	0	0
Total	**819**	**12,376,100**	**16,405,500**	**10,167,600**		**23**	**512,500**