

Minerals and Secondary Aggregate Technical Planning Group Annual Minerals Monitoring Report 2013 AMMR 2013

Purpose of the Report

The Minerals and Secondary Aggregate Technical Planning Group (MSATPG) Annual Minerals Monitoring Report (AMMR) is produced to:

- provide an agreed joint Industry/Government annual report on minerals on the IOM including data on: declared sales of minerals in tonnes and, where available, by end use; mineral reserves; forecasts of need; and landbanks.
- assess the future availability of minerals.
- identify any specific issues related to minerals production, availability or use on the island over the next 12 months and make recommendations on how to address those issues.

The information contained within this report is intended to advise the need for minerals considered essential for the social and economic well being of the Island. Although some minerals are imported, the aim of the Isle of Man is to maintain a high degree of self-sufficiency in mineral provision, particularly aggregates. This is inextricably linked to the need for the Island's mineral reserves to be used sustainably, and includes the use, wherever practicable, of recycled and secondary aggregate.

Status of the Report

The AMMR is published as the official Government statement on Minerals. It will support interpretation of the guidance within the Mineral Planning Policy Statement when published. It is intended to provide the statutory technical information required by the IOM Strategic Plan once revised.

The AMMR is supported by baseline geological data and historical information contained within the Department of Economic Development's (DED) Minerals Resources Plan, and takes account of the Department of Infrastructure (DOI) Waste Policy and Strategy 2012-2020¹.

Remit of the Report

The AMMR reports on mineral sales and reserves for all quarries on the Island. The Isle of Man is unique in the British Isles in that Government owns and operates two large hard rock quarries, namely Poortown Quarry and Stoney Mountain Quarry. The stated reason for this is to ensure a strategic supply of highest grade aggregate and crushed rock for infrastructure works. Whilst most of this aggregate is utilised by Government, mineral from both quarries is supplied to the commercial sector, some of which is for use in Government projects. At present it is only possible to confirm the tonnage of aggregate used in DOI Civil Engineering works. Mineral reserves within Government quarries are not intended for sale as a commodity².

In seeking to reflect this situation the AMMR reports the aggregate data in a number of formats, including and excluding Government sales and reserves. It is anticipated that this data will aid mineral planning in both at strategic planning and individual planning application stage.

¹ www.gov.im/transport/operations/wastemanagement/stratagy.xml

² http://www.pwc.com/en_GX/gx/energy-utilities-mining/pdf/ifrs-mining.pdf

Baseline Data

The baseline data used in this Report are provided from the following:

- a. Data on primary aggregate sales are provided by DED and are compiled from half yearly Mining Lease/licence returns. It covers the period from **1st December 2011 to 31st November 2012**.
- b. Data on recycled aggregate sales are provided by industry and have been combined to protect commercial confidentiality. In advance of licence return data being fully available, the data is collated from a limited number of companies involved in aggregate reprocessing and therefore presents a minimum figure.

Data on void space (Table 12) is incomplete. Information on remaining capacity within quarries with permitted infill is awaiting verification. Data on void space in operational quarries is difficult to ascertain. Figures presented are estimated tonnages for current planning permissions.

Report Summary

Sales of aggregate continue to decline from both sand and gravel (S&G) and hard rock (HR) quarries. The total aggregate sales for 2012 are 26% (104,324t) lower than sales in 2011. S&G sales showing a 31% (45,200) decrease, and all HR quarries a 24% (58,000t) decrease. Excluding the one-off extraction of HR in 2010 for construction of the airport runway, sales of primary aggregate and building stone on Island have continued to decline since 2008, recording a 47% reduction in sales. Even taking into account an increase in the use of recycled aggregate this reflects a significant reduction in activity in the minerals sector.

Sales of recycled aggregate are increasing. Data on the tonnage of inert waste reprocessed into recycled aggregate and subsequently used as a direct replacement for primary aggregate are not yet available. Work is in progress to collate this information. However it is known that companies involved in construction and demolition are focused on reducing the amount of waste material they have to dispose of. This has driven both the development of bespoke facilities for recycling aggregate and a change in working practices on-site to those which recover aggregate for reuse in-situ or reprocessing

Commercially operated quarries produce 69% (198,230t) of aggregate sold, with Government operated quarries producing 31% (89,200t) of all sales.

The reduction in the sale of aggregates has impacted on the length of landbanks which have held at 10 years or more if Government reserves and sales are included in the calculation. If Government operated quarries are not included in landbank calculations then at the end of May 2013 the landbank for HR stands at 9.8 years. The landbank for S&G is 17.8 years.

There are opportunities for reducing the use of primary won aggregate in construction projects, specifically in road construction, maintenance and repair. This will require a change from prescriptive to performance design specifications.

The use of crushed limestone as an agricultural fertilizer continues, but the tonnage applied to land has declined since 2007 from 6912t to 3855t in 2012. Trials to assess the neutralising value and performance of different forms of limestone are underway and the results are awaited.

**Minerals and Secondary Aggregate Technical Planning Group
Annual Minerals Monitoring Report 2013**

Contents	Page
AMMR Purpose, Status, Baseline data and Summary	i-ii
1 Sale of Primary Minerals	3
2 End use of extracted minerals	6
3 Tonnage of recycled and secondary aggregate sold or used off-site	9
4 Mineral reserves and licenced aggregate reprocessing capacity	11
5 Forecast need for minerals, and review of mineral production	15
6 Landbanks for Hard Rock and Sand and Gravel	18
7 Need for New Minerals Reserves	20
8 Imports/Exports	23
9 Mineral Matters and Issues	24
10 Membership of the MSATPG 2012/13	25

Figures and Tables:	Page
Figure 1 Percentile Summary of Primary Aggregate & Building Stone Sales 2012	4
Figure 2 Percentile Summary of Primary Aggregate & Building Stone Sales over 10 years 2003-2012	5
Figure 3 Percentile Summary of Aggregate Sales by sub Categories	7
Figure 4 Agricultural Lime Production 2004 – 2012	7
Figure 5 Tonnage of Domestic Glass delivered for recycling	9
Figure 6 Incinerator Bottom Ash Tonnage 2004-2012	10
Figure 7 List of Licenced Waste Aggregate Reprocessing Facilities	12
Figure 8 Comparison of Annual Mineral Sales to 10 year rolling average	15
Figure 9 Legend for Generalised Geological Maps and Site Maps	
Figure AMMR1A Generalised Geological Map (North West)	
Figure AMMR1B Generalised Geological Map (North East)	
Figure AMMR1C Generalised Geological Map (Central West)	
Figure AMMR1D Generalised Geological Map (Central East)	
Figure AMMR1E Generalised Geological Map (South West)	
Figure AMMR1F Generalised Geological Map (South East)	
Figure AMMR2 Point of Ayre Sand Pit	
Figure AMMR3 Cronk y Scotty Sand Pit	
Figure AMMR4 Ballaharra Sand Pit	

Figure AMMR5	Poortown Quarry	
Figure AMMR6	Stoney Mountain Quarry	
Figure AMMR7	Starch Mill Quarry	
Figure AMMR8	Cringle Quarry	
Figure AMMR9	Earystane Quarry	
Figure AMMR10	Billown Lime Quarry	
Figure AMMR11	Pooil Vaaish Quarry	
Figure MSA01	Point of Ayre	
Figure MSA02	Ballaharra Quarry	
Figure MSA03	Poortown Quarry	
Figure MSA04	Oatlands Complex	
Figure MSA05	Dhoon Quarry	
Figure MSA06	Cringle Quarry	
Figure MSA07	Earystane Quarry	
Figure MSA08	Billown Quarry	
Table 1	Summary of Primary Aggregate & Building Stone Sales 2012	3
Table 2	Total Sales as Primary Aggregate 2003 – 2012	4
Table 3	Total Sales as Building Stone 2003 – 2012	4
Table 4	Total Sales as Primary Aggregate & Building Stone 2003-2012	4
Table 5	Aggregate Sales by Sub Categories 2008 - 2012 (<i>'000 tonnes</i>)	6
Table 6	Sand and Gravel Reserves	11
Table 7	Hard Rock Reserves	11
Table 8	Forecast of Need for Sand & Gravel in 2013	16
Table 9	Forecast of Need for Hard Rock in 2013 (All Quarries)	16
Table 10	Forecast of Need for Hard Rock in 2013 (Excluding all sales from Government Quarries)	17
Table 11	MSATPG Membership	25
Appendix 1		
Table 12	Void Space	26
Table 13	Monitoring of Mineral Planning Application Decisions made 1 st January - 31 st December 2012	28
Table 14	Monitoring of Mineral Planning Applications awaiting determination as at 31 st May 2013	28

1 Sale of Primary Minerals

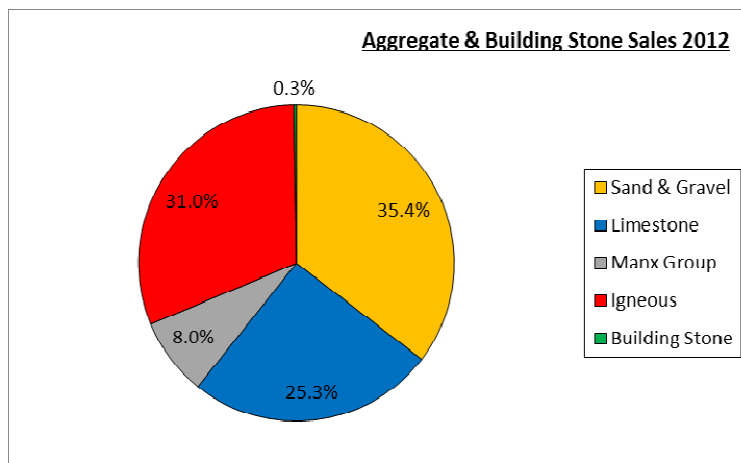
- 1.1 All mineral operators provide information on the actual tonnage of primary mineral sold (in the form of sand and gravel, crushed rock and building stone between 1st December 2011 and 31st November 2012) to the Department of Economic Development (DED). This information is managed and monitored by DED.
- 1.2 Data on quarry and ancillary mineral extraction is available dating back to 1993 which has been used to calculate the rolling 10 year averages of sand and gravel (S&G) and hard rock (HR) (see Section 5 - Forecast Need for Minerals).

Table 1: Summary of Primary Aggregate & Building Stone Sales 2011-12

	2011	2012
Mineral Operation	Tonnes ('000)	Tonnes ('000)
Ballaharra Sand Pit	19.76	13.57
Point of Ayre	126.18	87.72
Cronk y Scotty Sand Pit	1.05	0.51
Billown Quarry	83.7	69.55
Cringle Quarry (Crushed Rock)	27.22	21.84
Cringle Quarry (Building Stone)	0.56	0.27
Earystane Quarry (Crushed Rock)	0.01	0.25
Earystane Quarry (Building Stone)		0.24
Pooil Vaaish Quarry (Crushed Rock)	0.36	3.19
Pooil Vaaish Quarry (Building Stone)		0.12
Poortown Quarry (Crushed rock - DOI Civil Engineering)	32.75	24.51
Poortown Quarry (Crushed Rock - Other Sales)	46.06	36.31
Stoney Mountain Quarry (Crushed Rock - DOI Civil Engineering)	9.56	7.276
Stoney Mountain Quarry (Crushed Rock - Other Sales)	12.96	21.11
Starch Mill Quarry (Crushed Rock)	0.09	0.08
Starch Mill Quarry (Building Stone)	0.21	0.15
Ancillary Mining Total	32.42	0.74
TOTAL	391.76	287.436

Ancillary Mineral Operation		Tonnes
Ramsey Service Reservoir		0.74
Ancillary Mining Total	32.42	0.74

Figure 1: Percentile Summary of Primary Aggregate & Building Stone Sales 2012



Primary Mineral Extraction by Mineral Type: Sand and Gravel; Limestone; Manx Group; Igneous

Table 2: Total Sales as Primary Aggregate 2003 – 2012 ('000 tonnes)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sand & Gravel	304.67	286.36	184.19	223.91	203.41	201.78	178.32	146.53	146.99	101.80
Limestone	107.06	79.79	97.52	104.92	116.46	115.87	76.59	352.38 ¹	83.70	72.74
Manx Group	54.68	68.81	45.43	68.46	56.76	65.01	48.58	25.83	59.73	22.91
Igneous	127.11	115.50	85.35	58.86	98.21	157.71	140.56	110.58	100.20	89.20
TOTAL	593.52	550.46	412.48	456.15	474.84	540.38	444.05	635.33	390.61	286.66

1 Includes 274kt of stone supplied to RESA project from Turkeyland Quarry

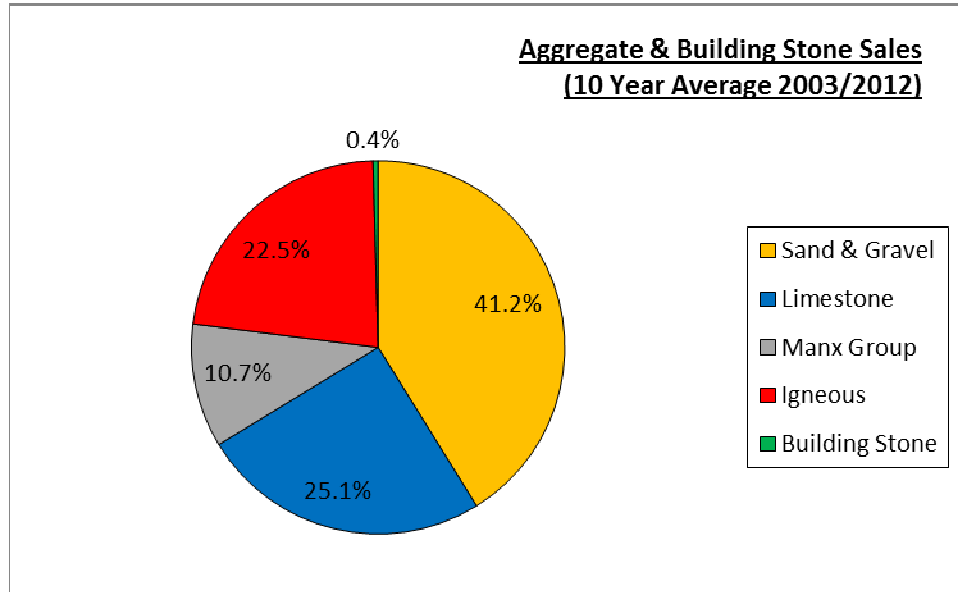
Table 3: Total Sales as Building Stone 2003 – 2012 ('000 tonnes)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Limestone	0.64	0.33	0.41	0.28	0.42	1.17	0.08	0.14	0.36	0.66
Manx Group	2.41	3.22	2.27	1.86	1.33	1.63	1.49	1.35	0.79	0.12
TOTAL	3.05	3.55	2.68	2.14	1.75	2.8	1.57	1.49	1.15	0.78

Table 4: Total Sales as Primary Aggregate & Building Stone 2002 – 2011 ('000 tonnes)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Primary Aggregate	593.52	550.46	412.48	456.15	470.88	540.38	438.46	635.33	390.61	286.66
Building Stone	3.05	3.55	2.68	2.14	1.75	2.8	1.57	1.49	1.15	0.78
TOTAL	596.57	554.01	415.16	458.29	472.62	543.18	440.05	636.81	391.76	287.44

Figure 2: Percentile Summary of Primary Aggregate & Building Stone Sales 2003/2012 (10 year average)



2 End use of extracted minerals

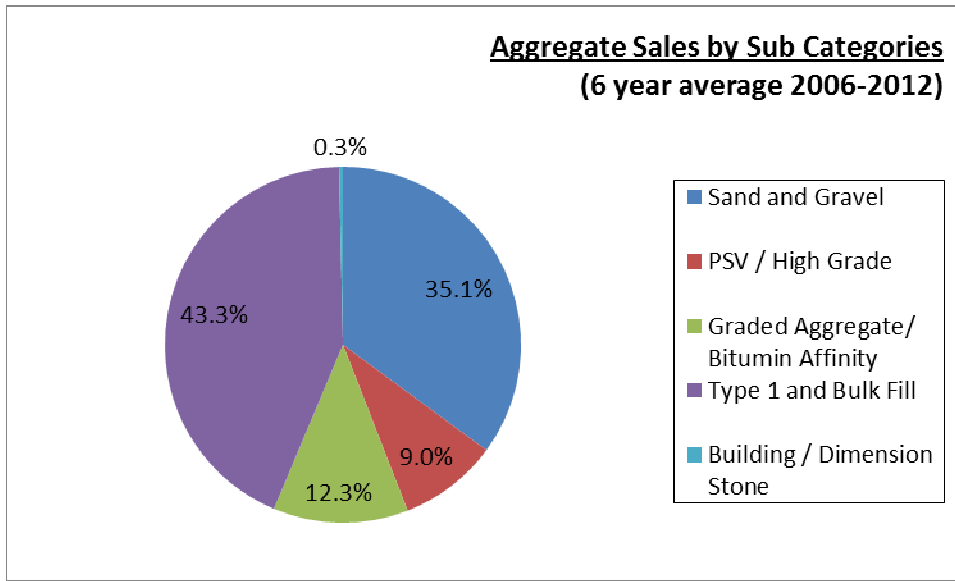
- 2.1 Extracted minerals can be processed into aggregate products which are suitable for a variety of end uses. The range of potential aggregate end uses is, in general, determined by the mineralogy of the sand & gravel and hard rock.
- 2.2 Data on mineral end-use over time can, where available, provide a useful indication of the demand for specific mineral products on Island. Whilst at the strategic level forecasting the need for Sand and Gravel and Hard Rock is based on a ten year average annual sales, a more detailed interpretation of product end-use can advise the assessment of individual mineral planning applications.
- 2.3 However caution needs to be applied to detailed interpretation of end use for forecasting need for the following reasons:
- End-use data is not reported for all quarries and does not include minerals imported (eg dimension stone)
 - The demand for road aggregate products is driven by the design guide for roads on the Island, Manx Roads 2 (MR2). MR2 is currently a prescriptive road construction design with quantity and type of aggregates specified. A move to a product performance led road design would reduce the demand for primary aggregate, including high grade polished stone value (psv) igneous mineral³.
 - Although not precluded from use, recycled aggregates are currently not accepted within road construction as they are not subject to performance standard testing. A move to a more sustainable use of aggregate should realise a reduction in demand for primary aggregate.

Table 5: Aggregate Sales by Sub Categories 2007 - 2012 ('000 tonnes)

	2007	2008	2009	2010	2011	2012	Total	6yr Average
Sand & Gravel	203.41	201.78	178.32	146.53	146.99	101.80	978.83	163.14
PSV / High Grade	32.90	40.94	68.57	33.58	38.60	36.41	251.00	41.83
Graded Aggregate/ Bitumen Affinity	50.85	84.35	59.66	51.67	51.13	44.16	341.82	56.97
Type 1 and Bulk Fill	190.11	214.52	138.84	404.76	155.04	105.19	1208.46	201.41
Building / Dimension Stone	1.74	2.80	1.58	1.49	1.15	0.78	9.54	1.59
TOTAL	479.00	544.39	446.96	638.03	392.90	288.34	2789.62	464.94

³ (PSV): The Polished Stone Value gives a measure of the resistance of an aggregate to the polishing action of a pneumatic tyre under conditions similar to those occurring on the surface of a road. The PSV number determines an aggregates resistance to skidding when used in the surface course of a road.
http://aggregain.wrap.org.uk/terminology/polished_stone.html

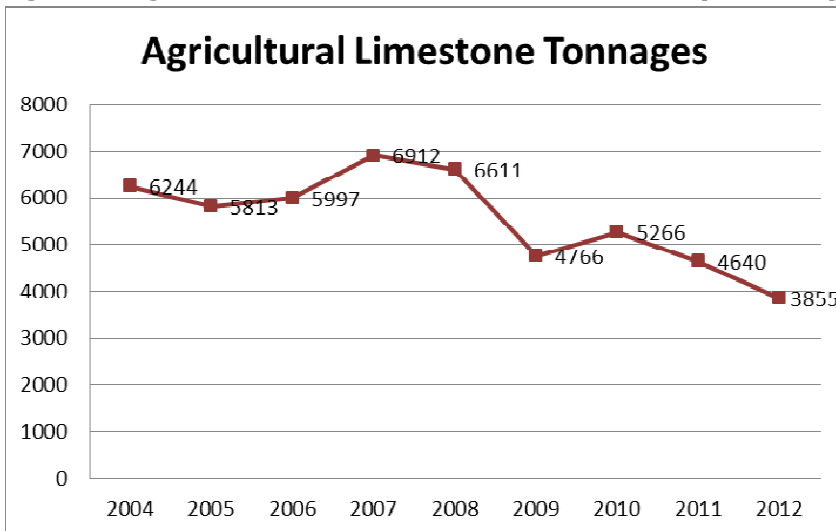
Figure 3: Percentile Summary of Aggregate Sales by sub Categories (6 year average)



Agricultural Lime

2.4 All agricultural land used for crop production requires the soil to have a pH in the region of 5.8 to 6.2 to maintain good levels of production and ensure that any fertilisers applied are utilised efficiently. The majority of the Island’s soils are acidic and therefore require the periodic application of lime to increase and/or maintain pH. Sources of lime include crushed limestone from the Island’s limestone reserve, imported crushed limestone, or imported pelletised lime. Limestone used for agricultural purposes is not classified as an ‘aggregate’ for the purposes of forecasting need for HR. However as the tonnage used is minimal in comparison with total aggregate sales it has not been excluded from the calculation of HR need.

Figure 4: Agricultural Lime Production 2004 – 2011 (Billown Quarry)



- 2.5 The effectiveness of different liming products is currently being evaluated by DEFA as part of a field trial with the results intended to highlight the benefits and effectiveness of the different products in terms of effect on soil pH, crop yield and performance. The liming products were applied for the crop harvest year 2012 and DEFA anticipate a conclusion August/September 2013. Until the results of the DEFA trials are available the MSATPG recommends the protection of limestone as an economic mineral for Island.
- 2.6 DEFA advise that, if Billown is to cease producing agricultural lime and there are no alternative on Island sources, the Island's agricultural industry will need to be given a reasonable period of notice to allow it to plan for alternative sources.

3 Tonnage of recycled and secondary aggregate sold or allocated for use off-site (tonnes)

- 3.1 The tonnage of recycled and secondary aggregate produced by waste management facilities licenced under the Public Health Act 1990 are submitted quarterly to DEFA. This information is managed and monitored by DEFA. Additional information on the production and management of construction and demolition waste may be available through returns for the 'Permit to Demolish a Building' issued under the Building Control Act 1991.
- 3.2 The data currently held on recycled or secondary aggregate production is incomplete. DEFA are in the process of revising their licence return forms and database to standardise the classification of waste types to European Waste Catalogue⁴ (EWC) codes, and simplify the process of returns. Once complete it is anticipated that data will be available for the 2014 AMMR.
- 3.3 In the interim, data on the sale of recycled aggregate from main aggregate re-processors is summarised below, together with data on the source waste material required for the production of recycled or secondary aggregate.

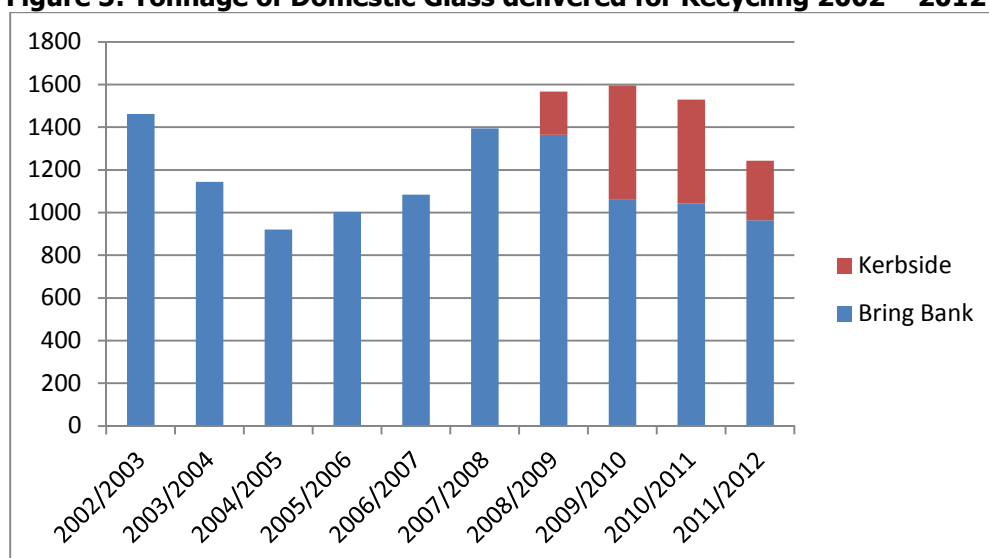
Minimum Sale of Recycled Aggregate (000's tonnes over 12 months)

	2011/12 *	2012
Recovered & Manufactured sand	34.84	35.50
Graded & Crushed Stone	52.44	58.09
Oversize	1.07	0.72
Total	88.35	94.31

* operations at one site commenced part way through 2011. Data for AMMR 2012 therefore included data from 2012 to provide a full year production. This data (Jan – May) is also reported for 2012.

Source Waste Material for Production of Recycled Aggregate

Figure 5: Tonnage of Domestic Glass delivered for Recycling 2002 – 2012

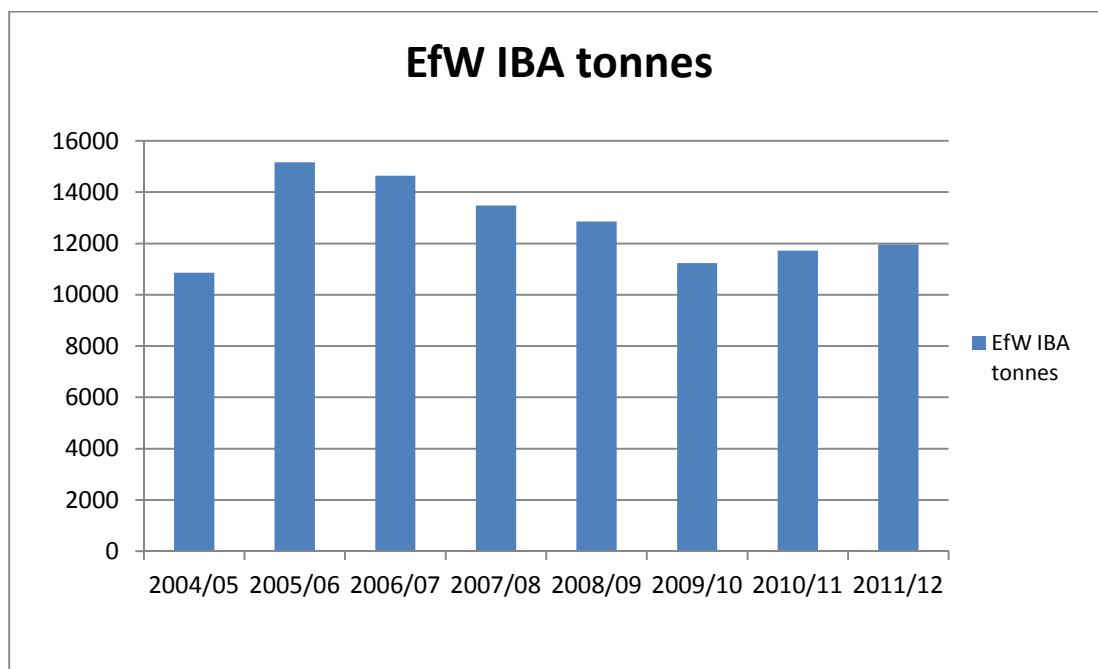


⁴ www.sepa.org.uk/waste/waste_data/reporting_definitions_and_term/coding_systems.aspx

Incinerator Bottom Ash (primary and secondary streams, includes boiler ash)

- 3.4 The Energy from Waste plant produced an average of 11,600 tonnes of Incinerator Bottom Ash [IBA] 2010 - 2012. Following metal extraction and maturation, the annual output of IBA produces around 9,500 tonnes of material with the potential for being reprocessed into Incinerator Bottom Ash Aggregate [IBAA]. This material is currently stored in Turkeyland Quarry (permitted landfill capacity 585,000m³). IBAA has the potential to be used as a secondary aggregate and feasibility studies are ongoing. Any future trials would be subject to site-specific environmental risk assessments.
- 3.5 The feasibility of use of IBAA in certain 'bound' applications eg bitumen coated stone and concrete blocks has been investigated. Due to costs associated with environmental risk control in storage of IBAA and with production plant modification, use of IBAA in these 'bound' applications is not considered to be commercially viable.
- 3.6 IBAA may have the engineering properties to be used in certain applications as a capping or sub-base in roads, paths and car-parks etc. DOI is considering where to undertake studies to assess the environmental risks associated with the use of IBAA in various locations.

Figure 6 Incinerator Bottom Ash tonnage 2004-2012



Source: DOI 2013

4 Mineral Reserves and Aggregate Reprocessing Capacity

4.1 A **mineral reserve** is the total tonnage of mineral that is permitted to be extracted under a planning permission. Mineral reserves have been calculated for all existing mineral operations. The mechanism for determining mineral reserves is based on two options:

- a) Any re-assessment of reserves carried out by the mineral operator; or
- b) Assessment of reserves based on the total tonnage of minerals permitted to be extracted by an approved planning permission and adjusted by deducting the total tonnage of sales between the date of activation of the planning permission and November 2012.

4.2 The reserve calculations have been undertaken by DED which collates information on annual mineral sales as part of the licencing of mineral extraction and collection of mineral royalties.

4.3 The following mineral reserves reflect the situation at each mineral operation as at the end of November 2012.

2013 Mineral Reserves

Table 6: Sand and Gravel Reserves

	2011	2012
Operation	Tonnes ('000)	Tonnes ('000)
Point of Ayre	3,074.00	2,986.28
Ballaharra Sand Pit	575.00	561.43
Cronk y Scotty Sand Pit	19.50	18.99
TOTAL	3,668.50	3,566.70

Table 7: Hard Rock Reserves

		2011	2012
Mineral	Operation	Tonnes ('000)	Tonnes ('000)
Limestone	Billown Quarry	297.20	227.65
	Pooil Vaaish Quarry	111.60	108.29
Manx Group	Cringle Quarry	1,237.50	1,215.39
	Earystane Quarry	135.00	134.51
	Starch Mill	37.70	37.47
Igneous	Poortown Quarry	1,058.80	997.98
	Stoney Mountain Quarry	2,335.00	2,306.61
	TOTAL	5,212.80	5,027.90

- 4.4 There are currently no capacity restrictions attached to waste management licences for **aggregate reprocessing facilities**. The reprocessing capacity of each site is therefore determined by a combination of material input, equipment capacity, size of facility, and any conditions attached to the planning permission. The list of licenced waste aggregate reprocessing facilities is listed in Figure 7. In addition to licenced facilities some construction and demolition waste aggregate may be managed at the point of production

Figure 7 List of Licenced Waste Aggregate Reprocessing Facilities

2013 List of Facilities Licenced Under the Public Health Act 1990 for Management of Inert Waste Materials

WASTE DISPOSAL LICENCE NO. (Expiry date)	LICENCE HOLDER	SITE ADDRESS	AUTHORISED WASTE TYPES which include	FACILITY TYPE
WDL/08/2010/V1	JCK Ltd	Fields 434057 & 434058, Balthane Industrial Estate, Ballasalla	Inert waste	Recycling and storage
WDL/04/2010/V1	Turkeyland Recycling & Waste Management Ltd.	Old Turkeyland Quarry, Balthane Road, Ballasalla	Incinerator Bottom Ash	Bottom Ash waste transfer station with treatment
WDL/05/2006/V2 (Not Applicable)	Mr A Corlett, Director,	Corletts Building Materials Ltd, Ballaharra Quarry, St. Johns, IM4 3RB	Inert construction and demolition waste	Landfill & Recycling
WDL/04/2003/V3 (Not Applicable)	David Crowe Plant Hire Ltd	David Crowe Plant Hire Ltd. Billy Goat Park, Stoney Mountain Road, Eairy, IM4 3HJ	Inert construction and demolition waste	Transfer Station
WDL/03/2010/V1	A. V. Craine & Sons Ltd.	Cringle Quarry, Ronague, IM9 4HJ	Inert waste	Recycling compound and storage facility
WDL/06/2005/V1 (Not Applicable)	Paul Carey & Sons Ltd.	Paul Carey & Sons Ltd., Land at the Technical Site, The Old Airfield, Braust, Andreas	Inert construction and demolition waste	Recycling Compound and Storage Facility
WDL/03/2005/V2	Heritage Homes Ltd.,	Heritage Homes Ltd., Field 522517, Richmond Hill, Braddan	Inert construction & demolition wastes	Recycling Compound & Transfer Station
WML/2002/V2/01 (Not Applicable)	Mr D. Ayres, Manx Metals (1983) Ltd.,	Manx Metals (1983) Ltd, Balthane Industrial Estate, IM9 2AQ	Inert, construction & demolition waste	Transfer Station and Recycling
DIR/01/2011/V1	Department of Infrastructure	Stoney Mountain Quarry, Stoney Mountain Road, Eairy, IM4 3HJ	Inert waste	Transfer Station
WDL/07/2010/V2	Tel's Recycle Ltd,	Tel's Recycle Ltd Units 43 & 43a Snugborough Trading Estate, Braddan,	Inert waste	Transfer station
WDL/01/2003/V2 (Not Applicable)	Birchalls (Plant Hire) Ltd.	Birchalls (Plant Hire) Ltd., The Technical Site, The Old Airfield, Andreas	Inert construction & demolition waste.	Transfer Station

Source: DEFA Environmental Protection Unit

Need for Facilities for Managing Construction and Demolition Type Waste

- 4.5 The evidence base for assessing the need for waste management facilities is the DOI Waste Policy and Strategy 2012-2022 (WPS) published in January 2013. In terms of waste management infrastructure requirements WPS Policy 4 Waste Infrastructure states 'We will ensure the Island has access to an adequate network of waste storage processing, treatment and disposal facilities developed in accordance with the principle of self-sufficiency, proximity and cost.' The WPS also states a 'reduction in landfill will be delivered..through an increase in reuse and recycling in construction and demolition type waste' (p4).
- 4.6 The WPS does not identify a shortage of, or a need for, construction and demolition (C&D) type reprocessing facilities either in totality or at specific locations across the Island. In planning policy terms therefore there is no acknowledged need for additional C&D reprocessing facilities, as required by Strategic Plan Waste Policy 1.
- 4.7 The past few years have seen an increase in the number of aggregate and C&D reprocessing facilities developed for private commercial use only. The operators of these facilities indicate they are for the sole use of one company/operator, and are not open for general commercial use. The key driver for this appears to be the cost, with savings in gate charges for a company owning its own site. Whilst there are no planning or licence restrictions on their use, in terms of the availability of facilities for reprocessing C&D waste/aggregate, this effectively reduces the number of sites and hence capacity commercially available. It is not known the extent to which this impacts on the amount of C&D type material reprocessed. It is known that existing licenced public commercial facilities are not operating at maximum capacity.
- 4.8 The main planning considerations in assessing the need for C&D waste type facilities are therefore in relation to:
- The source of waste arising, ie where in relation to the proposed facility will the majority of waste be produced;
 - Forecast waste arisings it the medium to long term, and options for on sites waste minimisation, reuse and reprocessing in accordance with the waste hierarchy;
 - Estimated tonnage of material to be imported to the facility annually;
 - The location of existing waste management facilities and any commercial restriction on their use;
 - The duration of the planning permission applied for;
 - The impact on carbon emissions from transportation of waste to the facility and the reprocessed aggregate and waste for landfill from the facility;

Need for Landfill Capacity

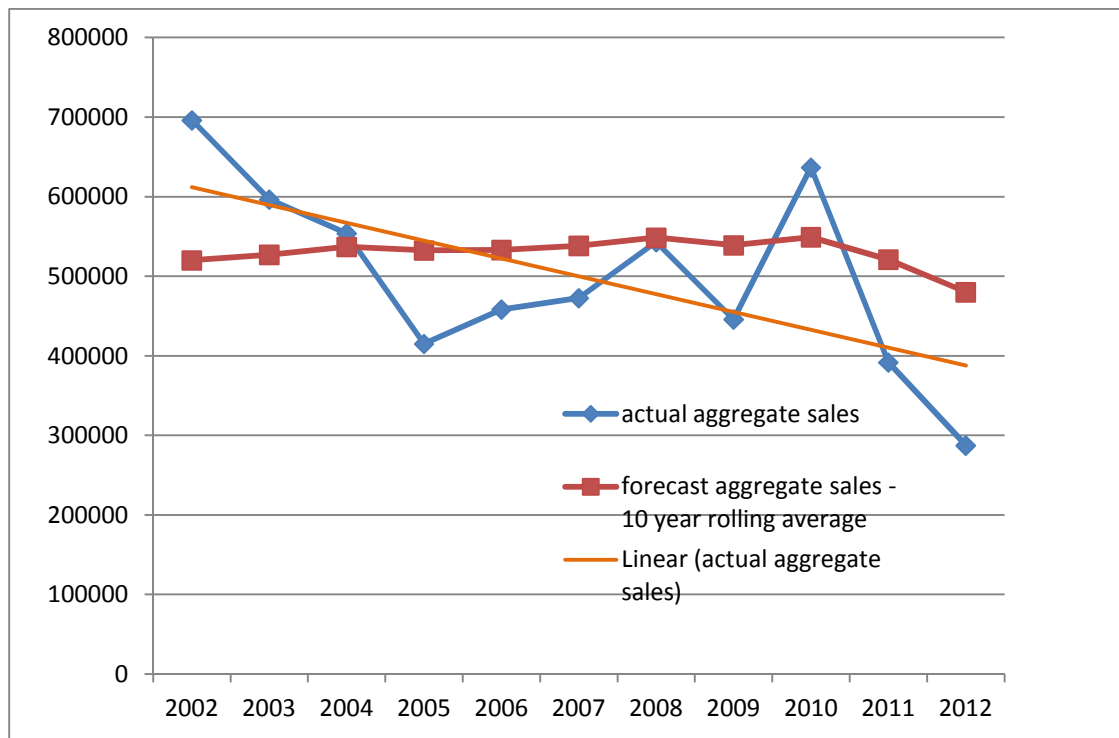
- 4.9 The WPS key proposal for landfill is to 'Develop a long term landfill solution for specific (problematic) wastes beyond the current lifespan of Wrights Pit North (ie 2020)'. The technical specifications, capacity requirement and preferred location of this void space are not included. The WPS does not identify a need for additional general landfill capacity for non-problematic wastes. The WPS indicates that the long term capacity for inert wastes is 'predominantly provided by Turkeylands Inert landfill site which has a capacity of over 600,000m³ void space' which alone will provide 'sufficient inert waste landfill space for the next 20 years.' In planning policy terms therefore there is no 'acknowledged need' for inert landfill capacity as required by IoM Strategic Plan 2007 - Waste Policy 1.

- 4.10 In relation to the restoration of former mineral workings by infill, the main planning considerations in relation to need will include:
- the forecast need for inert landfill void space post 2020;
 - the need for the Island to secure a landbank of strategic infill void space;
 - the location of existing landfill facilities and any commercial restriction on their use;
 - the capacity of the site and duration of planning permission applied for;
 - the suitability of former mineral workings to take differing types of landfill and engineering requirements (i.e. lining of waste cells)
 - the proximity principle and impact of carbon emissions from transportation of waste to the facility;
- 4.11 Table 12 in Appendix 1 indicates remaining void space for quarries with permission for restoration by infill, and lists all operational mineral workings with provisions for restoration and estimated permitted tonnages of mineral for extraction/associated void space. Please note this data is incomplete. Information on remaining capacity within quarries with permitted infill is awaiting verification. Data on void space in operational quarries is difficult to ascertain. Figures presented are estimated tonnages for current planning permissions. In many cases these are extensions to existing quarries and therefore total void capacity associated with that quarry will be considerably greater.

5 Forecast Need for Minerals, and Review of Mineral Production

- 5.1 Key for business planning in the minerals industry is certainty about the availability of reserves. Forecasting need for minerals based on changes in measures of economic activity (eg GDP) has historically proven to be unreliable. Using a 10 year rolling average of annual aggregate sales from all quarries to forecast the future 12 months minerals need is considered the most accurate method. This mitigates the potential of a one-off major infrastructure construction project to skew average aggregate demand.
- 5.2 For example the table below compares the forecast 10 year annual aggregates demand (S&G and HR) based on annual aggregate sales from 1993 (red line), and the actual annual aggregate sales (blue line). The spike in sales in 2010 is due to the one-off extraction of 274,000t of aggregate for use in the airport runway extension. The linear trend line (orange line) indicates a decrease in sales of primary aggregate since 2002. The difference between forecast and actual sales highlights the increased rate of decline in annual sales in recent years.

Figure 6: Comparison of Actual Aggregate Sales with Forecast Aggregate Sales Based on a 10 year rolling average



5.3 Forecast of Need

Forecast of Need for Sand and Gravel in 2013

Table 8: Forecast of Need for Sand and Gravel in 2013

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	10 Year Total Tonnes ('000)	10 Year Ave. Tonnes ('000)
Sand & Gravel	304.7	286.4	184.2	223.9	203.4	201.8	178.3	146.5	147.0	101.8	1,977.9	197.79

The annual sand and gravel requirement for 2013 is c.**197,800 tonnes**.

Forecast of Need for Hard Rock in 2013

Hard Rock quarries are operated on Island by both the commercial sector and by Government. To reflect how this impacts on commercial need for, and availability of, aggregate, the AMMR reports the aggregate data in a number of formats, including and excluding Government sales and reserves.

Option A All Sales from All Hard Rock quarries

Based on a 10 year rolling average of annual aggregate/building stone sales from **all hard rock quarries** including all sales (to private and commercial sectors) from Poortown (PT) and Stoney Mountain (SM) quarries.

Table 9: Forecast of Need – Hard Rock 2013 - All Hard Rock Quarries

Mineral Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	10 Year Total Tonnes ('000)	10 Year Ave. Tonnes ('000)
Limestone	107.1	79.8	97.5	104.9	116.46	115.9	76.6	352.4	83.7	72.8	1,207.1	120.7
Manx Group	54.7	68.8	45.4	68.5	56.8	65.0	48.6	25.8	59.7	23.6	516.9	51.7
Igneous	127.1	115.5	85.4	58.9	98.2	157.7	140.6	110.6	100.2	89.2	1,083.2	108.3
TOTAL	288.9	264.1	228.3	232.3	271.46	338.6	265.8	488.8	243.6	185.6	2,807.2	280.7

The total hard rock requirement for 2013 (based on all HR sales) is c.**280,700 tonnes**.

Option B Excludes All Sales from Poortown and Stoney Mountain Quarries

Based on a 10 year rolling average of annual aggregate/building stone sales from all HR quarries but excluding **all** sales from Poortown and Stoney Mountain quarries

Table 10: Forecast of Need - Hard Rock in 2013 – excludes all sales from PT and SM

Mineral Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	10 Year Total Tonnes ('000)	10 Year Ave. Tonnes ('000)
Limestone	107.1	79.8	97.5	104.9	116.4	115.9	76.6	352.4	83.7	72.8	1,207.1	120.7
Manx Group	54.7	68.8	45.4	68.5	56.8	65.0	48.6	25.8	59.7	23.6	516.9	51.7
TOTAL	161.8	148.6	142.9	173.4	173.2	180.9	125.2	378.2	143.4	96.4	1724.0	172.4

The total hard rock requirement for 2013 (excluding sales from Poortown and Stoney Mountain) is **c.172,400 tonnes**.

Summary of Need 2013

Mineral	Forecast annual need based on 10 years average sales from:	Annual tonnage
Sand and Gravel	all S&G quarries	197,800
Hard Rock	all HR quarries	280,700
Hard Rock	excluding Poortown and Stoney Mountain quarries	172,400

6 Landbanks

6.1 A mineral landbank is defined as the stock of permitted reserves that have a valid planning permission. Landbanks are needed to ensure a continuous supply of minerals. Conventional advice is that minimum length of the landbank should reflect the time needed to obtain planning permission and bring the operations into full production. The landbank required for both Hard Rock and Sand & Gravel is set at 10 years.

6.2 It is acknowledged that landbanks are only an indication of the availability of minerals. The interpretation and management of landbanks should be based on considerations of real need and real supply taking into account factors such as: the nature and quality of the aggregate which may change within a quarry and over time; known constraints on the availability of consented reserves that might limit output over the landbank period; significant future increases in demand that can be forecast with reasonable certainty.

Classification

6.3 The standard protocol adopted by Aggregate Working Parties across the UK for classifying landbanks is by main mineral type ie Hard Rock and Sand & Gravel. There is some sub- classification but this is for minerals with a specialised end use, eg silica sand.

6.4 The need for the Island to sub-classify these two main mineral types was considered. For example the Hard Rock landbank could be divided into high grade aggregate, Type 1/graded aggregate, building stone. In general this was considered impracticable. A hard rock resource may produce a range of aggregate types as the geology changes, or be processed into a range of products. The landbank for Hard Rock on the Island is therefore calculated as follows:

$$\text{Landbank for Hard Rock} = \frac{\text{Total Mineral reserves remaining at hard rock quarries}}{\text{Average 10 year annual mineral production from hard rock quarries}}$$

2013 Landbank Assessments

6.5 Landbank assessment at November 2012

Sand and Gravel Landbank

Sand and Gravel Landbank of permitted reserves	=	3,566,700 tonnes	
10 year forecast of annual production	=	197,790 tonnes	
Landbank Requirement	=	1,977,900 tonnes	(i.e. 197,790 tonnes x 10 years)
Status of Landbank	=	1,588,800 tonnes	(SURPLUS)
Length of Landbank	=	18.0 Years	(i.e. 3,566,700 ÷ 197,790)

Hard Rock

Hard Rock quarries are operated on Island by both the commercial sector and by Government. To reflect how this impacts on commercial need for, and availability of, aggregate, the AMMR reports aggregate data including and excluding Government sales and reserves.

Option A: Hard Rock Landbank all reserves and all sales

Hard Rock Landbank of permitted reserves	=	5,027,900 tonnes	
10 year forecast of annual production	=	280,720 tonnes	
Landbank Requirement	=	2,807,200 tonnes	(i.e. 281,720 tonnes x 10 years)
Status of Landbank	=	2,220,700 tonnes	(SURPLUS)
Length of Landbank	=	17.9 Years	(i.e. 5,027,900t ÷ 280,700t)

Option B : Hard Rock Landbank excluding reserves and sales for Poortown & Stoney Mountain

Hard Rock Landbank of permitted reserves	=	1,723,300 tonnes	
10 year forecast of annual production	=	172,400 tonnes	
Landbank Requirement	=	1,724,000 tonnes	(i.e. 172,400 tonnes x 10 years)
Status of Landbank	=	-700 tonnes	(DEFICIT)
Length of Landbank	=	10.0 Years	(i.e. 1,723,300t ÷ 172,400t)

6.6 Landbank Assessment at May 31st 2013.

The baseline data for the AMMR is November 2012. However it is possible to update the landbanks to take account of aggregate sales in the intervening six months to May 2013. There are two possible methods for updating landbanks, given that there have been no mineral permissions granted within this period:

- i. Re-calculation using mineral returns data for the period December 2012 to May 2013:

Sand and Gravel (46,367t)	17.8 years
Hard rock - all quarries (80,529t)	17.6 years
Hard Rock - excl SM and PT sales & reserves (35,665t)	9.8 years

7 Need for New Mineral Reserves

- 7.1 It is important for the economic wellbeing of the Island that as far as practicable, provision of minerals is made through the extraction and processing of indigenous mineral resources, and the reprocessing of waste aggregate.
- 7.2 The landbank for each main mineral classification is calculated from average annual mineral sales over the previous ten years. This does not include provision from recycled or secondary aggregate. At present there is no reliable methodology for forecasting future arisings of recycled aggregate, which depends heavily upon the activity of the construction and demolition sector. In reviewing mineral landbanks therefore consideration will need to be given to the potential supply of material from the recycling sector to replace the need for bulk/lower specification aggregate.

Call for Sites (CfS)

- 7.3 A landbank of less than 10 years highlights that new mineral reserves will be required to ensure the strategic provision of minerals to meet the forecasted mineral sales. Where a landbank is less than 10 years DOI-Planning will undertake a Call for Sites (CfS) to identify where industry are considering applications for future reserves.
- 7.4 The CfS process is not a planning applications process. It does not require the submission of detailed information about a prospective minerals site, or undergo the environmental impact assessment of a planning application. A CfS is an invitation to the minerals industry to identify mineral resources which, at some point in the future, they intend to apply to extract.
- 7.5 The CfS is a very useful process in so far as it can:
- i. assure the construction sector that minerals can be supplied on island;
 - ii. guide developers where future mineral sites may be developed requiring the need for buffer zones, or prior extraction to avoid mineral sterilisation;
 - iii. indicate to residents where mineral sites may be developed or extended.

Mineral Safeguarding Areas (MSA's)

7.5 Key also is the need for Mineral Safeguarding Areas (MSA's), within which the imperative is to safeguard the reserve from sterilisation by development or designation which would act as a constraint against future mineral extraction. MSA's support the sustainable management of minerals and are applied only to key economic minerals. On the Isle of Man these are identified as massive intrusions of igneous mineral ie diorite and granite, and are shown on the MSA maps: MSA 02Poortown, MSA 03Oatlands, MSA 04Dhoon, together with the appropriate 200m buffer zone⁵ for hard rock. It was acknowledged that delineation of these mineral resources will have to rely upon the best available geological map information supplemented with any available borehole data.

⁵ Minerals and Secondary Aggregate Technical Group: Technical Report April 2012

2012 - Need for Aggregate Reserves

7.6 A review of the 2012 landbanks indicates that at November 2012:

- i. there is **no** need to seek to identify further reserves of **sand and gravel** for aggregate purposes, the landbank standing at **18 years**
- ii. there is **no** need to seek to identify further reserves of **hard rock** for aggregate purposes. Calculation of landbanks including and excluding reserves from Government operated quarries stand at, or over, 10 years (**17.9 and 10.0 years** respectively).

However the landbank for Option B, which excludes reserves from Government operated quarries, is only 10 years. Without any further permitted commercial hard rock reserves in the next 12 months, the landbank will be below 10 years by AMMR 2013 and a call for sites will be required.

This need assessment does not take account of the need for agricultural lime as a non aggregate product covered in Section 2.

7.7 As mineral returns are submitted every six months it is possible to update landbanks to take account of sales of aggregate up to May 2013 and any additional permitted mineral reserves. Total tonnages for the 6 months November 2013 to May 2013 are 126,860 tonnes.

- i. there is **no** need to seek to identify further reserves of **sand and gravel** for aggregate purposes, the estimated landbank standing at **17.8 years**
- ii. Including all hard rock mineral reserves, there is **no** need to seek to identify further reserves, the estimated landbank standing at **17.6 years**
- iii. Excluding reserves from Government operated quarries, the estimated landbank drops below the recommended 10 year landbank threshold to **9.8 years**. A call for sites is therefore required.

NB the total sales tonnages for the 6 months from November 2013 to May 2013 (126,896t) is circa 23,146 tonnes (15.5%) lower than the sales tonnage for the same return period last year (150,042t). Even taking into account a potential increase in sales/use of recycled aggregate, this indicates that the demand for primary aggregate continues to decline.

7.8 A 'Restricted Call for Sites' (RCfS) to companies operational mineral workings was undertaken by the DoI Planning in November 2011. This followed the recommendation of the Minerals and Secondary Aggregate Technical Group (MSATG) after a review of methods for identifying potential new mineral reserves. Extensions to existing workings were preferred, the rationale being that, in general, a quarry extension has a lower environmental impact than a greenfield development.

7.9 The RCfS elicited five submissions none of which have been progressed. They have been confirmed for AMMR2013 and are indicated as a green line on the MSA site maps (MSA01 Point of Ayre, MSA02 Ballaharra, MSA05 Cringle, MSA06 Earystane,

MSA07 Billown), together with the appropriate buffer zone⁶ (100m for sand and gravel, 200 m for hard rock). The submissions did not contain sufficient information to allow a full assessment of their potential as prospective reserves, although as they are geologically conjunctive with current mineral permissions it can be assumed that suitable reserves are available. The proposed sites have not however been subject to assessment against planning policy, therefore access to RCfS mineral resources may be constrained or even prevented.

⁶ Minerals and Secondary Aggregate Technical Group: Technical Report April 2012

8 Minerals Imports and export

- 8.1 The Island needs a range of minerals to sustain its economy, infrastructure and welfare. These include hydrocarbons such as coal and oil, minerals such as salt, aggregate limestone, granite/diorite, and sand. Geologically some of these are readily available and accessible on Island, whilst others are not.

Imports

- 8.2 Where local sources of minerals do not occur, are not available in the quantities and specification required, or are economically not viable to extract, then minerals are imported. Of importance for the AMMR is to seek to identify the tonnage and type and frequency of aggregate imported. This indicates the degree to which the Island is self-sufficient in aggregate provision and where local reserves are not meeting aggregate product demands. Importation of aggregate is energy intensive and will increase the carbon load or embedded energy within the aggregate. This will contribute to the embodied⁷ carbon⁸ of infrastructure and buildings constructed using that aggregate.
- 8.3 Data on aggregate importation is limited as there is no requirement to declare imports. Bulk loads imported by ship can be monitored via DOI harbours data. There are no recorded landings of aggregate between Nov 11 to Nov 12. During 2012/2013 dimension or dressed stone continued to be imported for use as cladding and wall construction. However output from the main quarry producing dimension/dressed stone has now increased and it is anticipated that the use of locally sourced material will increase. It is known that dressed aggregate, aggregate and building stone is imported by builders merchants and for use in Regeneration Projects across the Island. Despite a request by DED, information about imports has not been forthcoming.

Exports

- 8.4 The market for mineral export is limited to specialist products. Geologically the main minerals reserve suitable for export is black limestone at Pool Vaish Quarry.

⁷ <http://www.sustain.co.uk/embodied-carbon.aspx> Embodied carbon is very closely related to [carbon footprinting](#). The main difference is that the term carbon footprint can also be used to discuss operational carbon requirements, for example heating and lighting a building, or operation of a power tool. Whereas embodied carbon can only be used in the context of materials, for example all activities related to the construction of a building, including the production of materials. Embodied carbon can be defined as the amount of carbon released from material extraction, transport, manufacturing, and related activities. This may be calculated from cradle to (factory) gate, cradle to (installation) site, or (ideally) from cradle to grave.

⁸ <http://www-csd.eng.cam.ac.uk/themes0/resource-flows-1/embodied-energy-and-carbon-in-buildings-eeeb> The UK Government pledged to reduce carbon emissions by 80% by 2050 (Climate Change Act of 2008). Regulations are being introduced requiring all new buildings to be 'zero carbon' by 2019. These are defined as buildings which emit net zero carbon during their operational lifetime.

In order to meet the 80% target it is necessary to reduce the carbon emitted during the whole life-cycle of buildings, including that emitted during the processes of material extraction, manufacturing, delivery to site, construction process, maintenance and refurbishment, waste processing, demolition and recycling. These elements make up the 'embodied carbon' of the building.

9 Minerals Matters and Issues

9.1 This is the second AMMR since the formation of the MSATPG in May 2012. During the forthcoming year the group aims to:

- a. Provide technical advice to DOI Planning on the drafting of the Minerals Planning Policy Statement (MPPS).
- b. Work with DEFA and DOI to improve the capture, collation and analysis of data on construction and demolition waste, and recycled aggregate.
- c. Promote the introduction of performance testing for aggregate and recycled aggregate for use in construction.
- d. Promote the revision of design standards for roads (MR2) to accommodate performance led design, to reduce primary aggregate consumption.
- e. Work with DOI to agree a formal position statement on the role played by Government in supplying aggregate to the commercial sector, and contributing to the national landbank of hard rock mineral reserves.
- f. Continue to monitor landbanks and need for aggregate
- g. Maintaining a watching brief on the DEFA trials of limestone aggregate as an agricultural fertiliser to determine the need to maintain a local source of agricultural lime on Island
- h. Maintain a watching brief on the review of health and safety legislation related to the operation and management of quarries and aggregate reprocessing facilities.
- i. Maintain a watching brief on production of the DOI implementation strategy 5 year Action Plan advised in the Waste Policy and Strategy 2012-2020.
- j. Examine further the need for, and benefits of, Restoration Bonds attached to planning permissions and consider options for their implementation.

10 Membership of the MSATPG 2012/13

Full Membership.

Membership of the MSATPG is taken from companies operating mineral workings on Island, companies licenced for the reception and processing of waste aggregate, and representatives from the Department of Infrastructure – Planning and Building Control and the Department of Economic Development – Mines and Minerals.

Table 11: MSATPG Membership 2012 - 2013

Quarry name(s)	Mineral type	Representative	Company
Cringle Quarry	Manx Group	Davey Craine	A V Craine & Sons Ltd
Earystane Quarry	Manx Group	Michael Craig	Earystone Ltd
Point of Ayre	Sand and Gravel	Mike Shaw	Island Aggregates Ltd Northstone
Billown	Limestone	John Kelly	Colas Holdings (IOM) Ltd
Balthane	Recycled Aggregate	James Cubbon	J.C.K Ltd
Ballaharra	Sand, Recycled Aggregate	Allen Corlett	Corletts
Poortown and Stoney Mountain	Granite	Stewart McLaren	Operations Director
		Representative	Government Department
		Stephanie Gray	DOI Planning
		Michael Gallagher	DOI Planning
		Dave Roberts	DED
		Neil Hughes	DED technical advisors - Wardell Armstrong LLP

Co-opted members

The Terms of Reference for the MSATPG allow co-option of representative from Government Departments or NGO's etc for the purpose of discussion specific technical operational or policy matters.

In 2012/13 no other members were co-opted to the MSATPG.

Appendix 1

Table 12 MSATPG AMMR 2013 - Void Space Audit

Site Name	Description		Final Void Space m ³	restoration	infill
SITES - PP FOR RESTORATION by INFILLING VOID					
Turkeylands	former quarry	limestone	601,500 m ³		y
Lhergydhoo	former quarry	sand	tbc m ³		y
Ballaharra	operational quarry pp 96/0745 11/1996	sand	amount unknown - part infill only	cou field to sand quarry 3767, extraction to max 3m below water table, with infill with inert to max 4m above wt	part
SITES - PP RESTORATION YET TO BE AGREED					
Billown Quarry	operational quarry	limestone	n/a	current pp prohibits infill. Interim restoration scheme submitted. Lease agreement is return to agricultural land use original land levels.	
Poortown	operational quarry; 03/01843/B EQ (on appeal 6/5/2005)	dolerite	n/a	landscape scheme submitted but matters of restoration to be included in a scheme (cond 32) for approval within 2 years cessation of quarrying	no but condition 30 indicates this is not precluded
Turkeylands	former quarry	limestone	est 56,000		
SITES - PP RESTORATION NO INFILL					
Py Ayre	Operational Quarry 97/01561	sand and gravel	n/a	low level restoration to lake	n
Stoney Mountain	Operational Quarry 09/01544/B EQ	granite	2,335,000 t	low level restoration, planting of heath and natural re-vegetation	n

Table 12 MSATPG AMMR 2013 - Void Space Audit continued					
Starch Mill	Operational quarry 01/02350/B	manx formation	37,500t	No overburden removed from the site O/B to be spread over the remaining flat surfaces/ rock faces when working completed and left to seed naturally.	n
Cringle	Operational Quarry 08/02090	manx formation	est reserves 1,215,000t	20 yr pp to 2030 - restoration to low level heathland and lake	n
Earystane	Operational Quarry 08/01790/B - 12/11/08 - to 12/11/18	manx formation	est reserves 134,000t	natural re-vegetation	n
Cronk y Scotty	Operational Quarry pp 11/01379/B 24/02/12	sand	est reserves 19,000t	Re-colonisation utilising turf and heath transplantation with marram grass	n
SITES - NO RESTORATION CONDITIONS					
Pooil Vaash	Operational Quarry	limestone	est reserves 108,000t		

Table 13: Monitoring of Mineral Planning Application and Ancillary Mining Applications Decisions made 1st January 2012 – 31st May 2013

Site Name	Grid Reference	Operator	Application Number	Date Submitted	Mineral Type	Area of Application (Ha)	Quantity of Minerals (Tonnes)	Decision /Date Issued
Cronk y Scotty Sand Pit	SC 367 007	D. Black & Sons	11/01379/B	04/10/2011	Sand	0.25	16,000	02/12/2011

Table 14: Monitoring of Mineral Planning Applications awaiting determination as at 31st May 2013

Site Name	Grid Reference	Operator	Application Number	Date Submitted	Mineral Type	Area of Application (Ha)	Quantity of Minerals (Tonnes)	Status
Pooil Vaish	225 467	Pooil Vaish Quarry	12/01118/B	06/08/2012	Limestone	1.4	130,000	pp granted subject to S13 25/02/13