



Strength from the depths

Seventh sustainable development report for the
British marine aggregate industry

February 2014

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Sustainable development

"The purpose of our strategy is to demonstrate the contribution and progress made by the British marine aggregate sector, through good governance and the use of sound science, in supporting the wider sustainable development objectives of achieving a sustainable economy, whilst at the same time ensuring a strong, healthy and just society, and living within environmental limits for current and future generations."



Headlines

The upturn in the market in 2011 was not sustained into 2012, although there has been a rebound in demand in South East England during 2013

A total of 16.79mt was dredged during 2012 – a 12.2% reduction on 2011

With the restrictions on the extent of dredging in many older licence areas, the area licensed reduced by 44% to 711 km²

Growing confidence that a long-term 'licence to operate' for the sector is emerging, as the result of a programme to secure new licences coupled with the development of marine planning

Operators continue to play a full role in the creation of a new network of Marine Conservation Zones

Industry publishes new best practice and state of knowledge reports covering the way its activities are assessed, managed and monitored

Key facts and figures

Key areas

	2012	% change	2011	2010	2009	2008
Area of UK seabed	867,000km ²	-	867,000km ²	867,000km ²	867,000km ²	867,000km ²
Area of seabed licensed for dredging	711km ²	-44.2%	1,274km ²	1,291km ²	1,286km ²	1,278km ²
Area available to be worked	391km ²	-31%	567km ²	552km ²	536km ²	570km ²
Area dredged	96.72km ²	-15.2%	114km ²	105.37km ²	123.63km ²	137.9km ²

Market summary

	2012	% change	2011	2010	2009	2008
Total GB aggregates market	189mt	-8.7%	207mt	206mt	203mt	256mt
Land-based aggregates	125mt	-8.4%	136.5mt	148m	147mt	187mt
Recycled and secondary aggregates	54mt	-10%	60mt	58mt	57mt	69mt
Total marine aggregates production	16.79mt	-12%	19.12mt	15.95mt	20.10mt	21.24mt
Marine landings to GB aggregates market	10.1mt	-12.2%	11.5mt	9.94mt	10.03mt	13.12mt
Marine landings to European aggregates market	4.5mt	-26%	6.1mt	5.19mt	5.66mt	6.21mt
Beach replenishment/contract fill	2.15mt	+44%	1.49mt	0.86mt	4.50mt	2.21mt

Market contribution to GB sand and gravel market

	2012	% change	2011	2010	2009	2008
Total GB market	51mt	-7.3%	55mt	55mt	55mt	72mt
Total England & Wales market	44.5mt	-8.4%	48.6mt	47mt	49mt	64mt
Marine landings to England & Wales	10.1mt	-12.2%	11.52mt	9.94mt	10.03mt	13.12mt
Marine landings to South East England	8.12mt	-15%	9.56mt	7.81mt	7.97mt	9.61mt
Marine landings to London & Thames Corridor	5.6mt	-18.8%	6.9mt	5.38mt	5.85mt	7.18mt
Marine landings to Wales	0.71mt	+16.4%	0.61mt	0.61mt	0.65mt	0.9mt

mt = million tonnes





Chairman's introduction

Welcome to the marine aggregate sector's sustainable development report for 2012 – our seventh such annual report. Under this initiative, we continue to publish a wide range of data to provide a comprehensive measure of the sustainable development performance of the sector as a whole.

While the performance of the marine aggregate sector showed a welcome upturn in 2011, this was not sustained in 2012 with landings into the sector's key markets of the Thames corridor and the near Continent being particularly affected by the ongoing economic downturn. This resulted in a number of vessels having to be laid-up during the year. Interestingly though, there has been a strong unforecast rebound in demand in the South East of England during 2013.

Over the last 24 months, the industry have been working with The Crown Estate, our regulators and their advisors on a large scale programme to secure new regulatory licences for a large number of historic licence areas.

Supported by the industry-led Marine Aggregate Regional Environmental Assessment process, various outputs from the Marine Aggregate Levy Sustainability Fund and a number of other regional studies and initiatives co-ordinated through BMAPA and The Crown Estate, there is growing optimism across the sector that the foundations for a long-term 'licence to operate' are now being established.

The grounds for a healthy and sustainable future for the sector are further heightened by the first draft marine plan for the East Inshore/Offshore region, which was prepared by the Marine Management Organisation and published in 2013.

While the plans are still to be finalised, the inclusion of draft policies to help safeguard and protect marine aggregate interests should go a considerable way to providing the confidence and certainty the sector requires in order to maintain its important and essential contribution to UK plc over the medium-term and beyond.

Kevin Seaman, Chairman, British Marine Aggregate Producers Association

... policies to help safeguard and protect marine aggregate interests should go a long way to providing the confidence and certainty the sector requires.



Kevin Seaman, Chairman, British Marine Aggregate Producers Association

... there is growing optimism that the foundations for a long-term 'licence to operate' are now being established.



Photo: London 2012

Sustainable production

Core values

Sustainable products: we understand our role in sustainable construction and actively promote the most efficient use of our products

Resource conservation: we recognise that we must make the most efficient use of all resources

OBJECTIVE 1
Maintain and improve profitability in order to provide for continuing investment and employment

Key performance indicator: Annual marine production

	2012	% change	2011	2010	2009	2008
Total (Crown Estate figures)	16.79mt	-12.2%	19.12mt	15.95mt	20.10mt	21.54mt
BMAPA reported production ¹	13.95mt	-14.9%	16.40mt	13.86mt	14.94mt	19.75mt

Key performance indicator: National/regional contribution to supply

	2012	% change	2011	2010	2009	2008
Landings to England & Wales	10.09mt	-10.3%	11.52mt	9.94mt	10.03mt	13.12mt
Landings to South East England	8.12mt	-15.1%	9.56mt	7.81mt	7.97mt	7.18mt
Landings to Wales	0.71mt	+16.4%	0.61mt	0.61mt	0.65mt	0.90mt
Beach replenishment/fill	2.15mt	+44%	1.49mt	0.86mt	4.49mt	2.21mt
Exports	4.55mt	-26%	6.10mt	5.19mt	5.66mt	6.21mt

Total marine aggregate production during 2012 reduced by 12% compared to 2011. Although landings to Wales (+16%) and one-off contract fill/beach nourishment (+44%) increased, this was offset by reduced landings to South-East England (-15%) and exports to the near Continent (-26%) – the two largest markets the sector supplies by volume.

Production reported by BMAPA members also reduced in 2012, reflecting the reduced demand for marine aggregates across two of the sector's most important markets.

OBJECTIVE 2
Maintain and increase investment in dredgers and dredging technology in order to improve efficiency and environmental performance

Key performance indicator: Profile of age/capability of dredging fleet

	2012	2011	2010	2009	2008
Average age of dredging fleet (years)	21.13	20.13	21.39	20.39	20

23 vessels were operated by members at the end of 2012, with an average age of 21.13 years.

The reduced market demand saw four of these vessels laid up by the end of 2012, with another working part time. A further vessel that was previously working part-time returned to full-time work in the last Quarter of the year. This compared with two vessels being laid up or only working part time at the end of 2011.

Key performance indicator: investment in vessels/technology over previous five years¹

2012 cap-ex investment in vessels (not including maintenance):

2012	% change	2011	2010	2009	2008
£0.94m	-63.85%	£2.60m	£4.16m	£4.20m	£9.92m

Rolling investment over previous five years

2012	% change	2011	2010	2009	2008
£21.78m	-10%	£24.21m	£24.83m	£25.24m	£29.44m

OBJECTIVE 3**Key performance indicator: Area dredged and hours dredged**

Make the most efficient use of available licensed resources

	2012	% change	2011	2010	2009	2008
Area of seabed licensed for dredging	711km ²	-44.2%	1,274km ²	1,291km ²	1,286km ²	1,278km ²
Area available to be worked	391km ²	-31%	567km ²	552km ²	536km ²	570km ²
Area dredged	96.72km ²	-15.2%	114km ²	105.37km ²	123.63km ²	137.90km ²
Hours dredged ¹	16,850 hrs	-10.57%	18,841 hrs	16,646 hrs	17,778 hrs	22,985 hrs

The sharp reduction in the area of seabed licensed during 2012 reflects the fact that many older licence areas were required to operate under short-term marine licences which restricted operations to the area of the historic dredged footprint. Once these licence areas secure their full term marine licences (2013/14), it is anticipated that the area of seabed licensed will return closer to historic levels.

OBJECTIVE 4**Key performance indicator: Tonnes landed per hour dredged¹**

Minimise the screening activity in the production process

	2012	% change	2011	2010	2009	2008
Marine aggregate production	13.95mt	-14.9%	16.4mt	13.86mt	14.93mt	19.75mt
Hours dredged	16,850 hrs	-10.6%	18,841 hrs	16,646 hrs	17,778 hrs	22,985 hrs
Tonnes landed/hour dredged	827.9tph	-4.9%	870.2tph	832.4tph	840.14tph	859.12tph

The relative decrease in hours dredged (-10.6%) compared to the equivalent decrease in reported production (-14.9%) suggests that the overall level of screening activity has increased slightly – a potential consequence of many production operations having to be limited to the extent of the historic dredge footprint. As a consequence, the metric for tonnes landed per hour dredged decreased by 4.9% compared to the equivalent figure for 2011.

OBJECTIVE 5**Best practice guidance on Coastal Impact Studies published**

Develop and promote best practice for resource management

As adverse changes to the coast arising from marine aggregate dredging would be clearly unacceptable in all but exceptional circumstances, the assessment of potential physical effects on a coastline forms a key part of the Environmental Impact Assessment process for any marine aggregate dredging proposal. The Government policies on marine mineral extraction are defined in the UK Marine Policy Statement (HM Government, 2011), and as a consequence decision makers will normally require a Coastal Impact Study (CIS) to comprehensively assess the possible coastal effects of dredging applications by considering potential changes in waves, currents and sediment transport as part of an Environmental Impact Assessment.

The British Marine Aggregate Producers Association and The Crown Estate have published a guidance note, which draws upon well established approaches to assessing coastal and physical impacts in order to establish best practice for the British marine aggregate industry, by advising on the scope, standards and transparency that are expected in a CIS.

It has been designed to be an interesting and valuable reference for a wide range of interested parties including dredging companies, environmental consultants, government regulators and agencies, local authorities, non-governmental organisations, other seabed and coastal users and the public.

http://www.bmapa.org/issues/coastal_erosion.php

Best practice resource monitoring methodology developed

As part of a major re-licensing process, the marine aggregate sector in conjunction with Cefas, the regulator's marine science advisor, has developed a new best practice methodology for determining average bathymetric and resource depth change across marine aggregate production licence areas. This approach has been adopted as a common standard, and enables operators to consistently and robustly demonstrate compliance with several conditions routinely attached to marine licences issued for marine mineral extraction.



Climate change and energy

Core values

Adaptation: we recognise the need to support future coastal and flood defence schemes through the provision of suitable resources to support local, regional and national beach replenishment requirements

Carbon management: we support the Government policy of reducing emissions of greenhouse gases

Transport: we are committed to reducing the impact of the transportation of aggregates and quarry products

OBJECTIVE 1 Key performance indicator: Marine Gas Oil consumed per tonne landed¹

Reduce the impact of atmospheric emissions released through the production and transport processes

	2012	% change	2011	2010	2009	2008
Total Marine Gas Oil	33,377t	-17.7%	40,562t	35,630t	37,873t	42,206t
Marine aggregate production	13.95mt	-14.9%	16.4mt	13.86mt	14.94mt	19.75mt
Marine Gas Oil per tonne landed	2.39kg/t	-3.2%	2.47kg/t	2.57kg/t	2.54kg/t	2.14kg/t

Key performance indicator: CO₂ emissions¹

	2012	% change	2011	2010	2009	2008
Total CO ₂ emissions (tonnes)	106,473t	-17.7%	129,393t	113,660t	120,815t	134,637t
Marine aggregate production	13.95mt	-14.9%	16.4mt	13.86mt	14.94mt	19.75mt
CO ₂ emissions per tonne landed	7.63 CO ₂ /t	-3.3%	7.89kg CO ₂ /t	8.20kg CO ₂ /t	8.09kg CO ₂ /t	6.82kg CO ₂ /t

(The calculation from MGO tonnes to CO₂ tonnes has been made using a conversion factor taken from DEFRA (2008) Guidelines to DEFRA's Greenhouse Gas Conversion Factors for Company Reporting. Department for Environment, Food and Rural Affairs, London. Accessed from: <http://www.defra.gov.uk/environment/business/reporting/conversion-factors.htm>)

The decrease in total fuel oil consumption and CO₂ emissions during 2012 (17%) broadly reflects the changes in reported production, which decreased by nearly 15% compared to the equivalent figure for 2011.

OBJECTIVE 2 Key performance indicator: tonnes landed per kilometre travelled¹

Maximise the efficient use of the dredging fleet

	2012	% change	2011	2010	2009	2008
Total kilometres steamed	1.11m km	-12.8%	1.27m km	1.20m km	1.08m km	1.46m km
Marine aggregate production	13.95mt	-14.9%	16.4mt	13.86mt	14.94mt	19.75mt
Total landed per km travelled	12.57t/km	-2.4%	12.88t/km	11.59t/km	13.82t/km	13.54t/km

The reduction in the total distance steamed by the dredging fleet during 2012 (-12.8%) is broadly consistent with the equivalent reduction in reported production (14.9%). This suggests that despite the reduced market demand, the dredging fleet was operating at a similar level of efficiency to the previous year.

Natural resources and environmental protection

Core values

Environmental protection: we recognise the potential of our operations to impact upon the marine environment and are committed to minimising and mitigating such effects

Biodiversity: we recognise the importance of marine biodiversity and the contribution we can make to better understanding and protection of marine species and habitats

Heritage: we recognise the historic significance of the seabed around the UK and believe that we can make a positive contribution to the understanding and protection of the marine historic environment

Marine stewardship: we have a responsibility to manage our operations in order to minimise the significance of our operations to stakeholders and the environment

OBJECTIVE 1 Minimise the spatial footprint of dredging operations through responsible and effective management

Key performance indicator: Area of seabed licensed for dredging

	2012	% change	2011	2010	2009	2008
Area of seabed licensed for dredging	711km ²	-44.2%	1,274km ²	1,291km ²	1,286km ²	1,278km ²
Active dredge area	391km ²	-31%	567km ²	551km ²	536km ²	570km ²
Area of seabed dredged	96.72km ²	-15.2%	114km ²	105.37km ²	123.63km ²	137.9km ²
Area of seabed where 90% of dredging occurs	36.42km ²	-15.8%	43.26km ²	37.63km ²	43.45km ²	48.22km ²
Area of seabed dredged for more than 1.25 hours	8.41km ²	-1.3%	8.52km ²	6.83km ²	6.83km ²	9.28km ²

The sharp reduction in the area of seabed licensed during 2012 reflects the fact that many older licence areas were required to operate under short-term marine licences which restricted operations to the area of their historic dredged footprint. Once these licence areas secure their full term marine licences (2013/14), it is anticipated that the area of seabed licensed will return closer to historic levels.





OBJECTIVE 2 **Marine Protected Area Network**

Maintain and develop the industry contribution towards the understanding of marine sand and gravel habitats

BMAPA and its member companies have continued to play a full and constructive role in the development of a network of Marine Protected Areas in UK seas, including the Marine Conservation Zone process that has been taking place in English waters. Both BMAPA and individual operators provided detailed responses to the public consultation that took place during Q1 2013, in some cases providing additional habitat mapping data to help refine the understanding of prospective sites and the sensitive features present within them.

With two further tranches of MCZ designations now confirmed over the next few years, BMAPA and its member companies will continue to work with Defra and the nature conservation agencies to help support the successful outcome of this process – both in terms of the identification of potential new sites, but also the development of appropriate management measures that may be associated with them. In certain cases, the monitoring work routinely undertaken to help manage marine aggregate operations has the potential to offer significant added-value to MCZ site management.

State of knowledge report published

BMAPA and The Crown Estate launched a significant new report in December 2013 which provides an overview of recent research and current marine aggregate industry practice. This follows the £25m investment in applied research delivered through the marine programme of the Aggregate Levy Sustainability Fund (ALSF) between 2002 and 2011.

The marine ALSF programme represented one of the most significant investments in UK marine environmental research and development over the last decade. By adopting a partnership approach, regulators, advisors, policy makers, industry and The Crown Estate were able to identify collective research priorities. This in turn enabled multi-disciplinary, practical outputs to be delivered in a cost-effective way. While these outputs have improved the way that marine aggregate operations are planned, assessed and managed, they have also provided considerable added-value in supporting wider marine planning and management initiatives, including helping to inform site selection through the ongoing Marine Conservation Zone programme.

The new report was commissioned by BMAPA and The Crown Estate to provide a synopsis of this investment, showcasing what has been achieved in order to provide a bookend to the completion of a hugely successful programme that was built on partnership between the public and private sectors.

http://www.bmapa.org/issues/aggregates_levy.php



Natural resources and environmental protection - continued

OBJECTIVE 3

Maintain and develop industry contribution towards the understanding of Britain's marine historic environment

The archaeological reporting protocol which was developed by BMAPA and English Heritage to enable archaeological finds encountered during marine aggregate operations (either on board dredgers or at the wharves) continues to be delivered through an implementation service provided by Wessex Archaeology, and co-funded by BMAPA and The Crown Estate. The service allows finds recovered by industry staff to be identified and assessed for their significance by heritage experts, and where necessary for appropriate mitigation to be introduced on production licence areas to protect previously unknown sites of importance, for example aircraft crash sites.

Since the protocol was introduced in 2005, over 330 separate reports have been filed by marine aggregate industry staff (52 in 2012/13), covering over 1,000 individual items (c.120 in 2012/13). Finds reported range from animal remains from the Palaeolithic period, through maritime artefacts, cannonballs and aircraft remains. The implementation service includes an annual report which details every find reported during the reporting year, and commenting on trends emerging over time.

<http://www.wessexarch.co.uk/projects/marine/bmapa/docs.html>

To support the practical delivery of the protocol, an awareness programme to encourage its use amongst industry staff working on both wharves and on the dredgers themselves continues to be funded through a partnership approach between BMAPA, The Crown Estate and English Heritage. The programme involves site visits by maritime archaeologists to provide industry staff with the knowledge and confidence to identify and report items of potential archaeological interest that may be found amongst dredged cargoes, as well as the production of twice-yearly 'Dredged Up' newsletters.

<http://www.wessexarch.co.uk/projects/marine/bmapa/protocol-awareness.html>

OBJECTIVE 4

Maintain effective controls to minimise the potential for pollution to the marine environment

Key performance indicator: number of recorded pollution incidents¹

2012	2011	2010	2009	2008
1 (minor hydraulic leak)	2 (both minor hydraulic leaks)	3	7	6

¹ Based on reported data from 21 out of 23 vessels operated by BMAPA members in UK waters.

Creating sustainable communities

Core values

Health & safety: our highest priority is the health & safety of employees, contractors and visitors

Employment: we recognise that our activities are an important source of employment and economic activity

Competence: we recognise the need to maintain and develop a competent workforce

Good neighbours: we engage with marine stakeholders, strive to be seen as good operators by other marine users and recognise the importance of partnerships in achieving both of these

Stakeholder accountability: we recognise the importance of operating as good corporate citizens

OBJECTIVE 1 Key performance indicator: Working days lost through work-related injury¹

Improve the occupational health and safety of the marine sector's employees

	2012	2011	2010	2009	2008
Number of reportable accidents (Lost Time Injuries)	8	2	3	6	3
Days lost through work-related injury	227 (sea staff) 0 (office staff)	59 (sea staff) 0 (office staff)	26 0	219	391

Health and safety remains the marine aggregate sector's top priority. Our ultimate aim will always be "zero harm" to our workforce. In seeking to achieve this, a number of initiatives continue to take place.

Lost Time Injury reporting

During 2010, BMAPA members generated a baseline historic record of Lost Time Injury incidents for the sector dating back to the beginning of 2009 for both office and sea staff. These incidents relate to any occupational accident or injury that results in an employee being incapacitated for three consecutive days or more.

BMAPA continues to collate and update this information every month to generate a rolling twelve month Lost Time Injury Frequency Rate. This allows the frequency of incidents per million hours worked to be calculated, and normalises the accident rate to allow trends over time to be identified.

In turn, this information feeds into the wider "Hard Target" initiative coordinated by BMAPA's parent organisation, the Mineral Products Association (MPA).

¹ Based on reported data from 21 out of 23 vessels operated by BMAPA members in UK waters.



Creating sustainable communities - continued

Wider accident reporting

As well as recording Lost Time Injuries, BMAPA members widened their monthly reporting commitment during 2012 to also include all Non-Reportable Accidents – any accident or injury where an employee receives first aid, but returns to work within 48 hours.

This extended commitment also includes a requirement to provide more information on the nature of all incidents reported, including the accident type, its cause, the nature of injury sustained and the treatment received. In turn, the enhanced level of detail allows the industry to reflect on any wider trends that may be emerging, enabling more targeted action to be taken where necessary.

Sharing experience

With the health and safety of all those involved with the marine aggregate industry being of prime importance to all companies within BMAPA, there is considerable value to be gained by individual members sharing their practical experiences with the sector as a whole. This allows the industry to collectively learn from others' experiences, enabling preventative steps to be taken in order to prevent similar incidents from occurring.

In response to an increase in LTI incidents during 2012, BMAPA members contributed to a safety workshop in early 2013. The event was attended by company health and safety professionals, office management and sea staff and provided a valuable opportunity to share experiences and ideas.

To assist in the exchange of often hard-earned knowledge and experience, BMAPA continues to produce electronic Safety Alerts based on information provided by individual members – with 7 Alerts being produced during 2012 and 9 during 2013. These are then able to be circulated to all marine aggregate vessels and wharves for information.

The main points of experience and lessons learned are presented in such a way that others may benefit from this information, while at the same time protecting the anonymity of the provider.

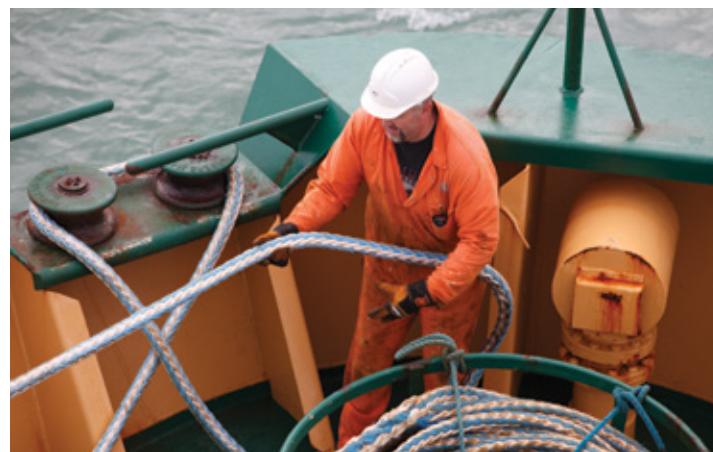
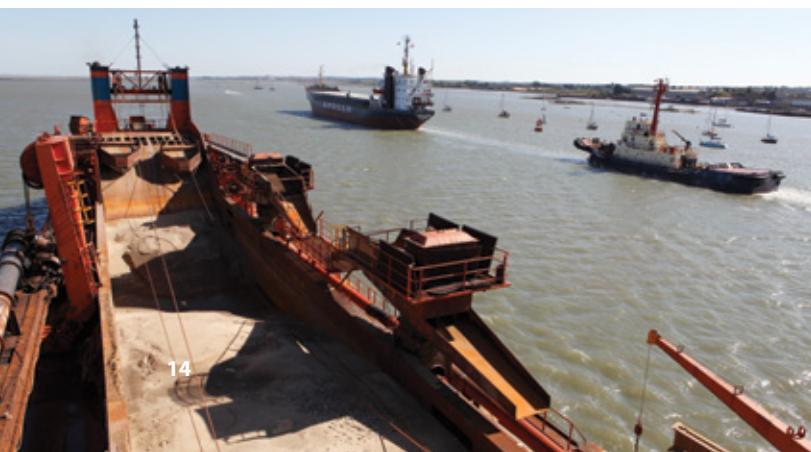
OBJECTIVE 2 Key performance indicator: Employment direct/indirect²

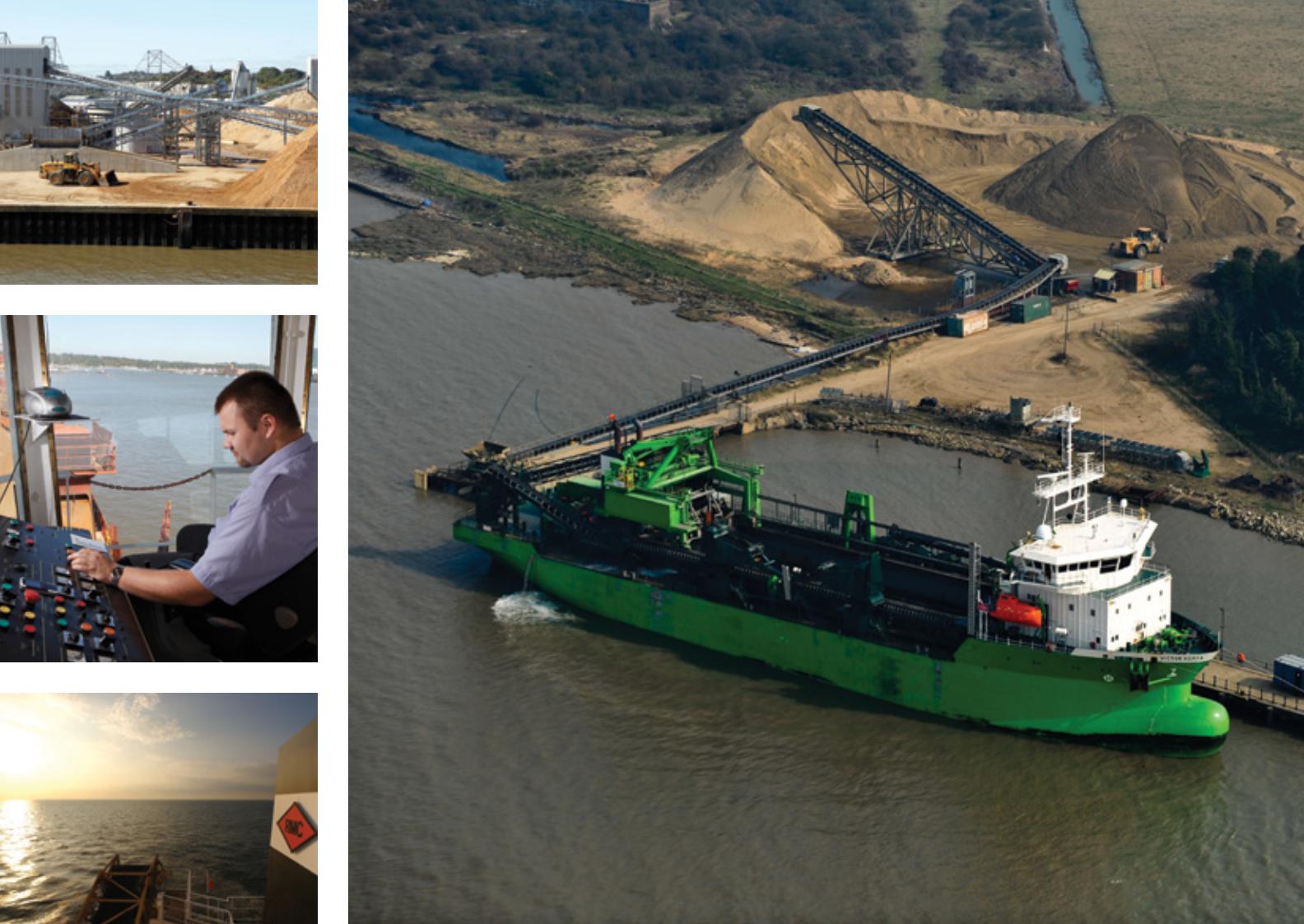
Improving employee development through vocational training	2012	% change	2011	2010	2009	2008
Office staff	59.5	0.2%	59.4	57.8	57	64.6
Sea staff	379	-6.4%	405	375	427	429

Key performance indicator: Training days per employee²

	2012	% change	2011	2010	2009	2008
Training days per employee	2.66	+13.7%	2.34	1.9	8.02	2.21

²Based on reported data from 6 BMAPA member companies, operating 21 of the 23 vessels working in UK waters.





OBJECTIVE 3

Kingfisher Fortnightly Bulletin service

Increasing the transparency of activities, and maintaining and developing further liaison with other marine stakeholders

Working in partnership with The Crown Estate, BMAPA continue to fund an electronic reporting arrangement for marine aggregate specific issues through the Kingfisher Fortnightly Bulletin service, administered by Seafish. The service mirrors the equivalent arrangements already in place for the oil & gas, renewable energy and offshore cables sectors, and allows information on changes to active dredging zones, commencement of works on new licence areas, notification of survey works and navigation obstructions to be electronically circulated to regional fisheries interests.

<http://www.seafish.org/fishermen/kingfisher/fortnightly-bulletin/>

Active dredge area charts

BMAPA continues to produce twice-yearly active dredge area charts in partnership with The Crown Estate. These define the extent of the licence area within which dredging is permitted to take place, which are then enforced through analysis of the 'black box' Electronic Monitoring System data recorded by every marine aggregate dredger operating in UK waters.

The charts are widely circulated by local Marine Management Organisation offices to provide fisheries interests with the most up to date information on the extent of marine aggregate operations.

http://www.bmapa.org/issues/other_sea_users.php

Area involved initiative

BMAPA and The Crown Estate continue to report summary information on the extent of licensed and dredged area under their area involved initiative which commenced in 1999. The annual 'area involved' report for activity in 2012 represented the 15th produced, and the spatial data generated by this ongoing initiative is becoming increasingly valuable to the marine protected area network and marine planning processes developing in English and Welsh waters, by clearly presenting the extent and intensity of marine aggregate operations and how these have changed over time.

http://www.bmapa.org/issues/area_dredged.php

Economies of scale and the impact of the economic downturn

By delivering large volumes of a low cost, bulk material close to the point of demand, economies of scale represent one of the marine aggregate sector's greatest advantages.

The 21 vessels operated by BMAPA members for which data has been reported in 2012 range in size from 1,250 tonnes to 8,800 tonnes capacity, with associated variations in vessel dimensions and engine power. However, all the vessels are highly specialised and fulfil particular roles in supplying essential marine sand and gravel supplies to the marketplace. This variation is effectively masked in the summing of overall key performance indicator information.

To assist analysis of key performance indicator data, the dredging fleet can be separated into two categories.

- i. Vessels with cargo capacities below 3,000 tonnes, which typically supply local wharves from nearshore licence areas, such as along the south coast, in the Bristol Channel and in the Irish Sea. Vessels will typically supply a cargo every 12-24 hours. (6 vessels/9,867t total hopper capacity – 9.5% of total fleet capacity)
- ii. Vessels with cargo capacities greater than 3,000 tonnes which typically operate in more offshore licence areas supplying more distant wharves, such as those along the River Thames and on the Continent. Vessels will typically supply a cargo every 24-48 hours. (15 vessels/93,743t total hopper capacity – 90.5% of total fleet capacity)

The two classes of vessel generally supply very different markets, therefore by separating their operational data it is possible to better understand and present the differences between the two. This should also allow the identification of trends that may occur over time in each class that would perhaps otherwise be masked in the summed dataset.





Sustainable production

OBJECTIVE 1 Key performance indicator: Annual marine production

Maintain and improve profitability in order to provide for continuing investment and employment

	2012	% change	2011	2010	2009	2008
Production <3,000t capacity	2,396,362t (17.2% tot)	-7.2%	2,583,052t (15.8% tot)	2,544,619t (18.4% tot)	2,409,769t (16% tot)	3,949,263t (20% tot)
Production >3,000t capacity	11,554,469t (82.8% tot)	-16.3%	13,812,539t (84.2% tot)	11,311,479t (81.6% tot)	12,526,171t (84% tot)	15,797,665t (80% tot)

OBJECTIVE 3 Key performance indicator: Area dredged and hours dredged

Make the most efficient use of available licensed resources

	2012	% change	2011	2010	2009	2008
Hours dredged <3,000t	4,031 hrs (23.9% tot)	-3.8%	4,194 hrs (22.3% tot)	3,811 hrs (22.9% tot)	3,734 hrs (21% tot)	6,831 hrs (29.7% tot)
Hours dredged >3,000t	12,819 hrs (76.1% tot)	-12.5%	14,647 hrs (77.1% tot)	12,835 hrs (79% tot)	14,044 hrs (70.3% tot)	16,154 hrs

OBJECTIVE 4 Key performance indicator: Tonnes landed per hour dredged

Minimise the screening activity in the production process

	2012	% change	2011	2010	2009	2008
Tonnes landed /hour dredged (<3kt)	594.5tph	-3.47%	615.9tph	667.7tph	645.36tph	578.14tph
Tonnes landed /hour dredged (>3kt)	901.4tph	-4.41%	943.0tph	881.3tph	891.92tph	977.94tph

Climate change and energy

OBJECTIVE 1 Key performance indicator: Fuel oil consumed per tonne landed

Reduce the impact of atmospheric emissions released through the production and transport processes	2012	% change	2011	2010	2009	2008
	Marine gas oil <3,000t capacity	2,831t (8.5% total)	-23.1%	3,681t (9.1% total)	3,685t (10.3% total)	3,593t (9.5% total)
	Marine gas oil >3,000t capacity	30,546t (91.5% total)	-17.2%	36,881t (90.9% total)	31,945t (90.7% total)	34,280t (90.5% total)
	<3kt kg MGO/tonne	1.18 kg/t	-17.5%	1.43kg/t	1.45kg/t	1.49kg/t
	>3kt kg MGO/tonne	2.64 kg/t	-1.1%	2.67kg/t	2.82kg/t	2.74kg/t
						2.31kg/t

Key performance indicator: CO₂ emissions

	2012	% change	2011	2010	2009	2008
<3kt carbon emissions	9,031t (8.5% total)	-23.1%	11,742t (9.1% total)	11,755t (10.3% total)	11,462t (13.6% total)	18,317t (13.6% total)
>3kt carbon emissions	97,442t (91.5% total)	-17.2%	117,650t (90.9% total)	101,905t (89.7% total)	109,353t (86.4% total)	116,320t (86.4% total)
<3kt kg CO ₂ /t landed	3.77kg CO ₂ /t	-17.1%	4.55kg CO ₂ /t	4.62kg CO ₂ /t	4.76kg CO ₂ /t	4.64kg CO ₂ /t
>3kt kg CO ₂ /t landed	843kg CO ₂ /t	-1.1%	8.52kg CO ₂ /t	9.0kg CO ₂ /t	8.73kg CO ₂ /t	7.36kg CO ₂ /t

(The calculation from MGO tonnes to CO₂ tonnes has been made using a conversion factor taken from DEFRA (2008) Guidelines to DEFRA's Greenhouse Gas Conversion Factors for Company Reporting. Department for Environment, Food and Rural Affairs, London. Accessed from: <http://www.defra.gov.uk/environment/business/reporting/conversion-factors.htm>)

OBJECTIVE 2 Key performance indicator: Tonnes landed per kilometre travelled

Maximise the efficient use of the dredging fleet	2012	% change	2011	2010	2009	2008
	Km steamed <3,000t capacity	154,678 km (13.9% total)	-16.1%	184,341km (14.5% total)	200,780km (16.8% total)	159,074km (14.7% total)
	Km steamed >3,000t capacity	955,094 km (86.1% total)	-12.23%	1,088,224km (85.5% total)	994,912km (83.2% total)	921,905km (85.3% total)
	<3kt t landed/km steamed	15.49 t/km steamed	+10.6%	14.01t/km steamed	12.67t/km	15.15t/km
	>3kt t landed/km steamed	12.10 t/km steamed	-4.6%	12.69t/km steamed	11.37t/km	13.91t/km

Changes in demand influence efficiency

While 2011 showed an increase in the marine aggregate production reported by BMAPA members (+18.3% compared to 2010), the production reported in 2012 reduced by 14.9% compared to the previous year. This occurred against a backdrop of overall construction aggregate demand in GB reducing by 8.7% over the same period. The reason for this scale of change in marine aggregate production can be largely explained by the significant reductions in two of the marine aggregate sector's principal market areas – London and the Thames river (-18.8%) and exports to the near Continent (-26%).

Analysis of the different vessels in the dredging fleet show that while both classes' overall production reduced, the greatest change was in the performance of the larger capacity vessels, -16.3% compared to -7.2% for the smaller capacity vessels. This is to be expected, given that it is the larger capacity vessels that would be responsible for supplying the principal market areas where the most significant reductions in demand have occurred.

Changes are also reflected in the relative performance across the other key performance indicators (KPIs) that are reported against. Whilst reduced production almost inevitably results in less fuel being burned because fewer cargoes are being physically delivered, the relative difference between the two classes of vessel in 2012 highlight some interesting trends.

Although the largest reduction in production terms was from the larger capacity vessels, the corresponding changes in the other KPIs, particularly in terms of kg fuel/tonne landed (-1.1%) and tonnes landed/km steamed (-4.6%), have remained broadly consistent. This would suggest that the levels of operational efficiency across this vessel class have remained broadly constant. Conversely, while the change in the smaller capacity vessels production was smaller, the change to some of the other KPI metrics was more significant. In particular the reduction in kg fuel/tonne landed (-17.5%) coupled with an increase in tonnes landed/km steamed (+10.6%) would suggest that the smaller vessels were able to be used more efficiently during 2012 – despite the levels of production reducing.



Appendices

GB market summary 1980 - 2012

	GDP Market prices chained volume measures	Construction output (GB) £m 2005 prices	Primary aggregates sales (GB) million tonnes	Crushed rock million tonnes	Sand and gravel (total) million tonnes
1980	698,528	72,539	199	103	96
1981	689,289	65,558	182	92	89
1982	703,711	68,084	194	103	91
1983	729,215	74,151	213	112	101
1984	748,691	76,596	211	111	100
1985	775,643	77,014	217	115	102
1986	806,765	79,968	228	123	106
1987	843,572	89,111	254	142	111
1988	886,020	97,610	291	162	130
1989	906,236	101,010	300	169	131
1990	913,299	100,423	278	162	116
1991	900,580	92,854	246	148	98
1992	901,901	89,129	233	144	89
1993	921,945	87,588	239	150	89
1994	961,407	87,168	259	162	98
1995	990,751	88,045	241	151	90
1996	1,019,337	90,864	215	133	82
1997	1,054,232	92,763	220	134	86
1998	1,094,704	94,387	218	132	86
1999	1,134,723	95,637	221	133	88
2000	1,185,305	96,613	219	130	89
2001	1,222,650	98,267	222	134	88
2002	1,255,142	103,684	210	127	83
2003	1,299,381	108,664	203	123	80
2004	1,337,782	114,320	214	128	86
2005	1,365,685	111,494	204	122	82
2006	1,401,290	112,339	207	127	80
2007	1,449,861	114,780	209	130	79
2008	1,433,871	111,630	187	115	72
2009	1,371,163	96,583	147	91	56
2010	1,399,850	104,571	148	93	55
2011	1,410,882	107,485	148	90	58
2012	1,505,993	98,907	133	83	50

Source: MPA 2013 SD report.

Marine sand and gravel figures exclude beach nourishment/contract fill and exports.

Sand & gravel (marine) million tonnes	Recycling (est) million tonnes	Total Aggregates (GB) million tonnes	Asphalt (GB) million tonnes	Ready-mixed concrete (GB) million cu m
12.5	20	219	24	22.4
11.5	18	200	22	19.9
11.9	19	213	26	20.7
12.8	21	234	27.2	21.5
12.6	21	232	25.5	20.8
13.8	22	239	26.9	21.6
15.3	23	251	28.4	21.5
16.2	25	279	29.9	24.3
19.6	29	320	31.8	28.8
20.7	32	332	33.7	29.6
17.2	33	311	36.7	26.78
12.4	34	280	36.4	22.53
10.6	35	268	36.6	20.78
10.1	37	276	36.3	20.77
11.3	39	298	37.7	22.93
11.6	42	283	34.9	21.68
11.5	45	260	29.3	20.89
12.0	48	268	27.5	22.33
13.0	51	269	27.7	22.93
13.4	54	275	26	23.55
14.4	57	276	25.7	23
13.6	60	282	26.5	23
13	62	272	27.8	22.54
12	64.5	268	27.8	22.3
13.0	67	281	26.9	22.9
13.0	66.6	271	27.9	22.4
14.0	68.7	276	25.7	22.9
14.0	70.5	280	25.7	23.5
12.6	68.5	256	25	20
10.0	56.5	203	20.5	14.4
10.0	57.6	206	21.5	14.26
11.5	60.0	208	22.4	15.3
10.3	54.0	187	18.5	13.9

Appendices

Marine aggregate summary statistics 1998 - 2012

	Area of seabed licensed for dredging (km²)*	Area available to be worked (km²)*	Area dredged (km²)*	Quantity dredged (million tonnes)**
1998	1,458		222.6	
1999	1,455		220.3	20.47
2000	1,464		155.4	23.68
2001	1,408	972	150.6	20.68
2002	1,359	896	149.8	22.76
2003	1,264	890	143.8	21.93
2004	1,257	780	134.5	22.23
2005	1,179	596	137.6	21.45
2006	1,316	576	140.6	21.09
2007	1,344	556	134.7	24.18
2008	1,278	570	137.9	21.24
2009	1,286	536	123.6	20.10
2010	1,291	552	105.4	15.95
2011	1,274	567	114.0	19.12
2012	711	391	96.7	16.79

* Taken from 'Marine Aggregate Dredging – The Area Involved' annual reports published by BMAPA and The Crown Estate between 1999 and 2013.

** Extracted from annual 'Marine Aggregates, Crown Estate Licences, Summary Statistics' reports published by The Crown Estate between 1998 and 2013. Quantity dredged comprises GB landings of construction aggregates, export landings of construction aggregates and beach replenishment / contract fill.



BMAPA members & dredging fleet

BMAPA member	Vessel	Built	Capacity (cubic metres)	Capacity (tonnes)	Age in 2012 (years)
Britannia Aggregates	Britannia Beaver	1991	2,775	4,800	20
CEMEX UK Marine	Sand Falcon	1998	4,832	8,359	13
	Sand Fulmar	1998	4,000	6,290	13
	Sand Harrier	1990	2,700	4,671	21
	Sand Heron	1990	2,700	4,671	21
	Sand Weaver	1974	2,400	4,152	37
	Welsh Piper	1987	790	1,367	24
DEMÉ Building Materials	Charlemagne	2002	5,000	8,650	9
	Victor Horta	2011	5,000	8,650	2
Hanson Aggregates Marine	Arco Adur	1988	2,890	5,000	23
	Arco Arun	1987	2,890	5,000	24
	Arco Avon	1986	2,890	5,000	25
	Arco Axe	1989	2,890	5,000	22
	Arco Beck	1989	2,600	4,500	22
	Arco Dart	1990	700	1,250	21
	Arco Dee	1990	700	1,250	21
	Arco Dijk	1992	5,100	8,800	19
	Arco Humber	1972	4,600	8,000	39
Northwood (Fareham)	Norstone	1971	800	1,400	40
Lafarge Tarmac Marine	City of Cardiff	1997	1,418	2,300	14
	City of Chichester	1997	1,418	2,300	14
	City of London	1990	2,652	4,750	21
	City of Westminster	1990	3,000	5,200	21
			Total fleet capacity	Total fleet capacity	Average vessel age
			67,565m³	111,360t	21.13 years

Other BMAPA members who do not operate vessels: Brett Group, Kendall Brothers (Portsmouth), Lafarge Aggregates, Sea Aggregates, Volker Dredging.

Lafarge Tarmac Marine was previously known as Tarmac Marine Dredging.

Figures and members correct as of 31.12.12.



The British Marine Aggregate Producers Association is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries.

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