


Appendix 6 - Attachment G

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| EP-02 | Conducting an Environmental Risk Assessment |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-02 | REV: 04 | DATE: 08.07.2014 | PAGE: 1/2 |

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|------------------------|--|
| Purpose: | To determine the significant environmental aspects associated with project activities. |
| Scope: | All sites and activities |
| Responsibility: | Contract/Project Manager and Environmental Co-ordinator |

Definitions:

Environmental Aspect – element of an organisation’s products or services that can interact with the environment. Aspects may be direct (those caused as a direct result of the Company’s activities and therefore controllable) or indirect (those over which the Company has influence but no direct control).

Environmental Impact – any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s activities, products or services. Aspects and impacts should be thought of in terms of ‘cause’ and ‘effect’ respectively. That is, activities have aspects (interactions with the surrounding environment) that cause environmental impacts (changes to that environment).

Significant Environmental Aspect – aspect that has or can have a significant impact on the environment.

Environmental Risk Assessment – the method used to identify and quantify the risks associated with a particular site and activity, establish the environmental impacts and aspects and identify control measures required.

Management Requirement:

All activities that have significant environmental aspects must be managed. The following procedure must be used prior to commencement on site to determine those activities that have significant environmental aspects. Control measures must be implemented when carrying out these activities to reduce the potential for the environmental impact to occur.


Management Procedure:

The following procedure will be completed by the Environmental Co-ordinator or **nominated other** using the Environmental Risk Assessment Report Form, following a review of the environmental compliance requirements for the particular project or activity (refer to EP-01) and after detailed descriptions from the Site Management Team of the proposed activities on site.


1. Identify all of the activities associated with the project within the scope of the contract and under BAM Civil / BAM Building / **BAM Rail / BAM FM** control.
2. For each activity list the environmental aspects associated with it taking into account whether the activity occurs during normal, abnormal or emergency working conditions.
3. For every aspect list the potential impact on the surrounding environment. Once this impact has been determined, the **pre-controlled risk rating** will be determined. This is done by:-
 - Determining the **severity** (moderate, significant, major) and comparing this with the **likelihood** of environmental harm being caused (very unlikely, possible, very likely). This calculation results in the **pre-controlled risk rating** for the particular activity.
4. **Control measures** will then be added to the pre-controlled risk rating for each activity which results in the **controlled risk rating**. This is done by:-
 - Identifying the **new** severity and comparing this with the **new** likelihood of environmental harm being caused. This will result in the **controlled risk rating**
5. A copy of the ERA should be attached to the EMP.

Any environmental aspect with a score of 4 or greater (pre-control measure) is considered to be a significant Environment Risk and must be controlled.

The ERA should be updated at least every 6 months or if and when significant tasks are planned.

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| EP-02 | Conducting an Environmental Risk Assessment |  | | |
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| Risk Rating Explanations: |
| <p><u>Severity</u> Moderate Environmental Impact – low level work required to return to natural state Significant Environmental Impact – high level remediation and monetary value required to return to natural state Major Environmental Impact – major remediation, and high monetary value required and EPA or Local Authority must be informed</p> <p><u>Likelihood</u> Very unlikely – an event which may happen less than once per year doing this activity every day Possible – an event which is likely to happen more than 3 times a year doing this activity every day Very likely – an event which is probably going to happen</p> |
| Control Measures: |
| <p>Environmental Control Measures to mitigate the environmental risks shall be implemented during works. The control measures must be included in the project EMP and/or method statements for specific activities. Compliance must be monitored through regular inspections, in accordance with EP-05.</p> <p>For any further information or advice contact the Environmental Coordinator, Paula Lockhart, on 086 386 0623.</p> |
| References: |
| <p>IEMA (2005) Environmental Management in Organisations. Earthscan</p> <p>ISO 14001:2004 Environmental Management Systems – Specification with Guidance for Use</p> <p>P Hyde & P Reeve (2001) Essentials of Environmental Management. IOSH</p> <p>TMS Consulting (2006) Training Course Notes - IEMA approved foundation course in environmental auditing (Ireland)</p> |

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| EP-03 | Environmental Objectives & Targets |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-03 | REV: 03 | DATE: 22.07.2014 | PAGE: 1/1 |

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|------------------------|--|
| Purpose: | To set environmental objectives and targets. |
| Scope: | All sites and activities |
| Responsibility: | HSE Management Team / Site Management Teams |

Definitions (from ISO 14001:2004):

Environmental objective – overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve
Environmental target – detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives


Management Procedure:

Environmental objectives and targets must be set at the commencement of new projects and thereafter reviewed at regular intervals. Objectives and targets must be feasible, within the scope of the contract and related to the significant environmental aspects, as determined via the environmental risk assessment procedure (EP-02). Internal environmental audits will be conducted quarterly to assess success in complying with / achieving the stated objectives. Therefore do not set objectives and targets that are not attainable.

Objectives & Targets will be reviewed as per EP-27 Objectives & Targets and information relayed to all staff via QSM 3 of each year and the ASM of each year.

1. When setting objectives and targets consideration must be given to the following:
 - The company environmental policy – objectives and targets must be consistent with the policy
 - Overall objectives and targets set by the Company Environmental Coordinator that can be found in the Environmental Year Plan. These are applicable to all sites and activities and must be included when setting site specific targets
 - Compliance requirements for the contract, which may include specific environmental objectives, and should be included in the Environmental Compliance Requirements section of the EMP. Refer to EP-01 Environmental Compliance Assessment
 - The significant environmental aspects associated with the activities that will be carried out as part of the contract. Refer to the ERA report and EP-02 Environmental Risk Assessment
2. Objectives and targets should cover as a minimum:
 - The prevention of pollution, including emissions to air, water and land
 - Nuisance impacts including dust, noise and vibration
 - Protection of habitat areas and individual species, if applicable
 - Storage and use of fuels and hazardous substances, including spills
 - Waste management and
 - Energy usage
3. Environmental Management Targets:

When setting targets to achieve the overall objective they should be SMART – that is, targets must be Specific, Measurable, Achievable, Realistic and Time-related. Targets must also be related to the significant risks highlighted in the site specific EMP. With regard to time limits, it is reasonable to assume that the targets must be achieved during the duration of the project. However, there may be circumstances where other time constraints are set. For example, for projects that will continue over a number of years, yearly targets may be more appropriate. See example Targets Table attached.

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|--|---|---|------------------|-----------|
| EP-03 | Environmental Objectives & Targets |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-03 | REV: 03 | DATE: 22.07.2014 | PAGE: 2/1 |

4. Objectives and targets must be recorded in the relevant section of the EMP. This section must ensure the objectives and targets are related to the significant aspects of the site and in attempt to reduce these significant aspects during the course of the project.

References:

C Sheldon & M Yoxon (2006) Environmental Management Systems – A Step By Step Guide. Earthscan

P Hyde & P Reeve (2001) Essentials of Environmental Management. IOSH

ISO 14001:2004 Environmental Management Systems – Specification with Guidance for Use

Attachment: Example Targets Table

| Targets | Measurable | Methodology | Responsibility | Timescale |
|---|--|--|-----------------------|---------------------|
| 2% reduction of total construction and office waste (relative to total revenue) compared to 2013 | Lean Construction Techniques, segregation more, reuse more (waste hierarchy) | Purchase less, ensure packaging is removed by supplier where possible and other materials reused & recycled | Management Team | Start to completion |
| 2% increase in our construction waste segregation compared to 2013 | Reduced waste costs, increased waste segregation | Staff training, improved waste recycling facilities, reduction in materials purchased | Management Team | Start to completion |
| 2% reduction of the relative CO ₂ emissions (total CO ₂ per total revenue) compared to 2013 | Energy bills, service costs, smart meters | Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible | Management Team | Start to completion |
| <10% of total BAM incidents will be environmental <ul style="list-style-type: none"> o <60% of those shall be fuel/oil spill related o <40% of those shall be environmental nuisance | Environmental Incidents, spills contained in bunds, complaints | Use drip trays, ensure fuel storage areas are bunded, good communication with local residents, clean working areas, strict working hours, maintained plant & equipment etc | Management Team | Start to completion |
| Ensure correct disposal of all hazardous wastes | Waste segregation, waste costs | All hazardous wastes to be disposed as per Irish Legislation and BAM requirements | Management Team | Start to completion |
| Lower emissions of dust, smoke and fumes during works | Air quality, dust particle increase | Ensure all equipment is well serviced and maintained. Switch of equipment when not in use. Use dust suppression techniques when applicable | Management Team | Start to completion |
| Minimise water usage consumption | Water charges, waste water disposal (discharge volumes) | All grey water to be reused on site where possible. 'Fresh' water supply to be kept to a minimum where possible. | Management Team | Start to completion |

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| EP-27 | Achieving Targets & Objectives on site |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-27 | REV: 01 | DATE: 23.07.2013 | PAGE: 1/4 |

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| Purpose: | To detail the processes to be followed to abide within the objectives and targets for each site. |
| Scope: | All sites and activities |
| Regulatory Requirements: | Various |
| Responsibility: | All site personnel |
| BAM Corporate Targets: | Detailed below |

Objectives and Targets are set for all sites, based on their potential environmental impacts, previous environmental incidents and legal requirements in conjunction with Corporate Social Responsibility (CSR). The Corporate Social Responsibility programme which acts to improve our **sustainability methods** and create a **positive reaction** to the environmental through **community engagement** and **compliance with legal and ethical standards**.

As a results of this programme and our Environmental Management System, the below targets were established:-

- ❖ Achieve a zero environmental incident level (*water, noise, dust, vibration etc*)
- ❖ Ensure response time to public complaints is less than 2 days
- ❖ Reduce the amount of waste being sent to landfill by 15% by 2015 (on 2009 totals)
- ❖ Reduce CO₂ emissions by 15% by 2015 compared to 2009 (taking into account nature and turnover projects)
- ❖ Increase site segregation of construction waste by 15%
- ❖ Reduce construction and office waste by 15%

BAM Site Targets (can vary from site to site)

Waste

- ❖ Reduce waste sent to landfill by 15% by 2015
- ❖ Ensure correct disposal of all hazardous wastes
- ❖ Reduce amount of waste materials generated on site
- ❖ Increase recycling rates

CO₂

- ❖ Lower consumption of materials/energy
- ❖ Reduce CO₂ emissions by 15% by 2015

Dust

- ❖ Lower emissions of dust, smoke and fumes
- ❖ Minimise risk of aspergillus

Water

- ❖ Minimise water usage consumption
- ❖ Ensure no incidents of contamination to groundwater occur
- ❖ Ensure no incidents of pollution to water courses, foul systems etc

Fuel & oils

- ❖ Lower fuel and oil spillages from site activities

Noise & Vibration

- ❖ Minimise noise and vibration
- ❖ pollution

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| EP-27 | Achieving Targets & Objectives on site |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-27 | REV: 01 | DATE: 23.07.2013 | PAGE: 2/4 |

Environmental Nuisance

- ❖ Ensure roads are kept clean
- ❖ No damage to flora and fauna permitted
- ❖ Ensure complaints are responded to within 2 working days and closed out within 7 working days

Suggested method for achieving these targets on site

| Sites | Area | Objectives & Targets | Method for achieving | Assistance by HSE Dept. (method) | Responsibility |
|--|--|--|--|--|----------------------|
| All sites and offices | Waste | Reduce waste sent to landfill by 15% by 2015 (on 2009 levels) | Adhere to the waste hierarchy. Lean construction techniques (order less, order when required only, reuse and recycle). | EA-30 Excavated materials on site (Article 27 Notification Forms). CIRIA documents on Lean Construction (environmental guidance documents on SharePoint) | Site Teams |
| | | Increase site segregation of construction waste by 15% | Where possible have more recycling skips displayed on site. Ensure all staff know where to put each waste stream via TBT's and site induction. | EP-16 waste definitions and classifications, TBT-03 Managing Waste, TBT-02 Environmental Awareness, EB-11 Site Set up. | Site Teams |
| | | Reduce construction waste by 15% | Adhere to the waste hierarchy. Lean construction techniques (order less, order when required only, reuse and recycle). | Lean construction & BIM and Lean Construction and sustainability guidance documents on SharePoint (environmental guidance documents area) | Site Teams |
| | | Reduce office waste by 15% | Paperless initiative to be investigated | IT Department to investigate and report to HSE Department | IT Department |
| | | | New Vodafone ordering system which eliminates the previous paper based form | Fully automated system by IT Department | IT Department |
| | | | Replacing printers | Replacing printers at head office and all sites | IT Dept & Site Teams |
| Ensure correct disposal of hazardous waste | Adhere to HSE documents and procedures. Ensure staff are trained. | EP-20 Determining if waste is hazardous. EA-21 Hazardous Waste Changes. TBT-08 Storage of hazardous waste on site | Site Teams | | |
| Reduce amount of waste materials generated on site | Adhere to waste hierarchy. Lean construction techniques - only order when needed rather than at start of project, return materials which are not required. | EP-16 Waste definitions and classifications. Lean construction & BIM and Lean Construction and sustainability guidance documents on SharePoint (environmental guidance documents area) | Site Teams | | |
| Sites | Water | Ensure no incidents of water pollution | No water to be discharged into surface or foul systems without treatment and permission. Staff to be trained on site. | EP-10 Surface water controls, EP-11 Managing Impacts on groundwater. Guidance documents on SharePoint including British Standards and CIRIA document. Concrete wash out areas to be established and no concrete water to be discharged - see EB-13 Concrete wash out systems. EA-12 Pumping Water to be adhered to when using pumps on site. | Site Teams |

| Sites | Area | Objectives & Targets | Method for achieving | Assistance by HSE Dept. (method) | Responsibility |
|-------|--------------------------|--|--|--|-------------------------|
| Sites | Water | Minimise water consumption on site | Reduce water usage. Adhered to the water hierarchy. Use less, reuse and recycle water where possible | Water charges are increasing while water resources are diminishing. TBT-12 Water in Construction | Site Teams |
| Sites | Noise & Vibration | Minimise the disturbance to the local community | Work within agreed hours, use well maintained plant and equipment, work as per BS 5228:2009 Noise & Vibration control on constructing sites. Where required install noise and vibration recording equipment and a warning system for breaches. | EP-09 Noise & Vibration procedure. BS 5228:2009 Noise & Vibration on construction sites. | Site Teams |
| Site | Energy & CO ₂ | Reduce CO ₂ emissions by 15% by 2015 on 2009 levels | Energy management programme is being carried out with Sustainable Energy Authority Ireland which will improve staff awareness on energy management and policy and implement energy savings on site. Cost analysis tools will be used to calculate energy consumption of the plant equipment and opportunities for further reductions. | Programme with SEAI. Procurement of low emissions vehicles by Plant Department. 95% of vehicles are now diesel. Video conferencing capabilities in Kill, Cork and Galway offices to cut down on travel times, emissions etc. | Site Teams |
| | | | SMART Meters will be installed on all sites which are not connected to mains electricity by Q3 2013 | Plant Department will purchase and install SMART Meters (sites will be charged accordingly) | Plant Dept |
| | | | Online changes. Online Incident Tracking System. Online process for setting up new sites with Finance Department. Drivers questionnaire replaced with online system | Replacing individual printers at site levels with shared usage multifunction devices. | IT Dept and Individuals |
| | | | Increased use of more energy efficient site plant. | Plant Department investigating replacement of site generators (to be confirmed) | Site Teams |
| Sites | Dust | Minimise the disturbance to the local community | Ensure works are done in line with BAM procedures and processes. Consider the weather before starting certain tasks. Damp down work areas where required | EP-08 Air Pollution Control, Safety Procedure ORA 25-1(a) Aspergillus | Site Teams |
| | Dust, smoke and fumes | Lower emissions of dust, smoke and fumes during works | Ensure well maintained plant is used, cease the use of plant which emits black smoke. Isolate faulty equipment. | EP-08 air pollution control. Site EMP details controls for dust minimisation. | Site Teams |
| Sites | Oil & Fuel | Lower fuel & oil spillages for site activities | Oils & fuels to be stored in correct containers, stored in chemical/hazardous stores, always sat in bunds when in use on site, designated refuelling area to be established, bunds to be checked regularly, bunds to be emptied responsibly. No fuels or oils to be stored near water courses. No disposal or wash out of tools in surface or storm water. Staff to be trained via TBTs and Inductions | EP-13 Bulk Oil and Fuel Storage, EP-14 Storage and Handling of Hazardous Substances, EP-15 Containing and Cleaning up Spills, EP-14 Complaints and Incidents Procedure. British Standard and CIRIA documents to be consulted for further information store on SharePoint | Site Teams |

| Sites | Area | Objectives & Targets | Method for achieving | Assistance by HSE Dept. (method) | Responsibility |
|-------------------|-----------------|---|---|--|----------------|
| Sites | Env Incidents | Ensure sediment on roads is dealt with | Road sweepers, wheel wash systems, good housekeeping. | TBT-12 Water on construction sites, EB-11 Site set up, Good Environmental Practice pocket book stored on SharePoint and sent to sites. | Site Teams |
| | Env. Incidents | Achieve a zero environmental incidents rate | Adhere to all BAM procedures and the environmental library based on SharePoint | all environmental procedures, guidance document, and other related environmental standards etc are stored on SharePoint for the company to view for advice and guidance | Site Teams |
| Sites and Offices | Env. Complaints | Response time to public complaints <2 days | Ensure process for dealing with complaints is known. Designated responsibility to the Project Manager or equivalent | Complaints method outlined in the EMP. Ensure all sites have EF-06 Complaints Register and EF-08 Complaints Form. Where possible, Publics Relations manager to be established (larger projects only) | Site Teams |
| Sites | Flora & Fauna | No damage to be caused to flora & fauna | Ensure designated paths/roads are identified and included in the site traffic management plan. No deviated from this plan to be tolerated. Where route includes removing flora or fauna, NPWS service to be contacted for assistance. | Licences can be issued by the NPWS and Inland Fisheries Ireland for the movement of certain fauna (badgers, bats, fish etc.). Bats, badgers, otters and fish poster to be adhered to. All environmental posters to be positioned on site and guidance taken from those initially (located on SharePoint) | Site Teams |
| | | No movement of invasive plants without permissions and licences | Department of Arts, Heritage Gealtach (DAHG) and National Parks and Wildlife Services (NPWS) to be contacted when invasive plants identified. DAHG will issue a licence for the movement of the plant and the contaminated soils. | EA-29 to be adhered to. TBT-09 Japanese Knotweed, Invasive Plants Poster. Advice can be given by the HSE Department regarding movement or protection or excursions if not to be moved from site. | Site Teams |

Monitoring and Improvements

The progress of the objectives and targets (*including environmental incidents*) is monitored on a monthly basis at site level and bi-annually from Head Office. This information will be communicated to all personnel during the Annual Safety Meeting (ASM) and third Quarterly Safety Meeting (QSM) of each year. This information can then be relayed to the sites and if necessary, working practices can be altered to ensure objectives and targets are met by the end of the year.

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|--|---|---|------------------|-----------|
| EP-28 | Water Consumption & Conservation |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-28 | REV: 01 | DATE: 05.11.2013 | PAGE: 1/2 |

| | |
|------------------------|---|
| Purpose: | To detail the processes to be followed when consuming and conserving water on construction sites. |
| Scope: | All sites and activities |
| Responsibility: | Contract/Project Manager, Site Agents, HSE Officers |

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| Regulatory Requirement: | |
| <ul style="list-style-type: none"> • Inland Fisheries Ireland Acts and Amendments, 1959 - 2010 • Planning and Development Act, 2000 and Amendment Act, 2002 • European Communities (Water Policy) Regulations 2003 • Environmental Protection Acts 1992-2003 | |

Introduction:

As a construction company, BAM have always realised the significant risks when working near or with water which involved surface and ground water pollution. However, our risks are evolving and water usage has become an environmental risk with the potential for significant environmental impacts for future generations.

The two main principles when working with water on site are *limiting fresh water usage and reusing as much water as possible.*

This procedure covers the environmental issues associated with:-

1. Water Conservation
2. Water Harvesting
3. Wheel Wash Water

Management Procedure:

1. Water Conservation

- All employees will take reasonable measures to conserve water
- All employees to consider water reclamation (*using harvested water*) rather than fresh water
- Water conservation measures will be employed on site to optimise water usage. Such measures may include, but are not limited to:
 - urinal flush controls
 - spray taps
 - low volume flush toilet
 - concrete wagons to wash off-site only
 - fit trigger guns to hoses
 - staff training
 - appropriate site signage
- Detected or suspected leakage or wastage will be reported to the Site Management Team who will investigate all such incidences and undertake prompt remedial action (*i.e. within 24 hours*). Such examples include, but are not restricted to:
 - running taps that cannot be turned off
 - leaks or suspected leaks
- Plant and equipment (*where appropriate*) shall be selected for their water-efficiency rating

Such steps can save up to 15 - 25% of your water consumption, or up to 85% where leaks are identified.

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|--|---|---|------------------|-----------|
| EP-28 | Water Consumption & Conservation |  | | |
| Note: Always print or copy to double-sided pages | PROC. NO: EP-28 | REV: 01 | DATE: 05.11.2013 | PAGE: 2/2 |

2. Water Harvesting

Each site will use IBC drums or similar (*where applicable*) to collect rainwater for site usage (*non-drinking water only*). This water can be used for site activities such as mixing cement, site damp down, tool washing etc.

The rainwater harvesting system should include a tank for primary storage, which may be positioned either above or below ground. All tanks should be appropriate to the site.

2.1 Above ground tanks

Above ground tanks should be securely mounted and supported on a firm level base capable of withstanding the weight of the tank when filled with water to the rim.

2.2 Below ground tanks

Below ground or partially buried tanks should be installed so that they are not deformed or damaged. Measures, such as concrete surrounds or backfilling should be taken to ensure the structural stability of these tanks.

2.3 Labelling and identification

Rainwater harvesting systems should be marked and or labelled.

2.4 Labelling

Frequent water sample testing is not necessary; however observations for water quality can be made during inspections.

3. Wheel wash water

Water from wheel washing areas *can* contain oil, diesel and silt. Ensure that water from wheel washing facilities is contained and not allowed to soak into surrounding ground.

However, if not contaminated, water from a wheel wash can be reused for damping dusty areas.

For further information, please contact the HSE Department on 045 886 536.

References:-

- British Standard BS 8515:2009 Rainwater Harvesting Code of Practice
- BAM EP-15 Containing and Cleaning up Spills
- BAM EP-10 Surface Water Control