

Considerations and Perspectives from an Environmental Practitioner

Workshop on the Development of Standards and Guidelines for Activities in the Area

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Outline



Many environmental standards, guidelines, conventions exist that are transferable



What about the gaps?



Challenges



Remember the goals, objectives and principles



Approaches: Ideas



Many environmental standards, guidelines, conventions exist that are transferable

- e.g. offshore dredging environmental standards and guidelines (list not exhaustive)

No	Abbreviation used in tables	Reference
1	ANZECC	Australian and New Zealand Environment Conservation Council. Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000
2	BPEM	Environmental Protection Authority Victoria, Best Practice Environmental Management Guidelines for dredging, 2001
3	CEDA	Central Dredging Association (CEDA), Technical Guidance on Underwater Sound in Relation to Dredging, 2011
4	CRIMP	Hewitt, C.L. and Martin, R.B., Revised protocols for baseline port surveys for introduced marine species: survey design, sampling protocols and specimen handling. Centre for Research on Introduced Marine Pests. Technical Report No 22. CSIRO Marine Research, 2001
5	EAG	Environmental Protection Authority Western Australia, Environmental Assessment Guideline for Marine Dredging Proposals, 2011
6	EMP	Commonwealth of Australia, Environmental Management Plan Guidelines, 2014
7	EPBC-2.1	Commonwealth of Australia, EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales, 2008
8	EPBC-2.1b	Commonwealth of Australia, Background paper to the EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales, 2008
9	EPBC-EAP	Commonwealth of Australia, EPBC Act – Environment Assessment Process, 2010
10	EPBC-Reporting	Commonwealth of Australia, Guidelines for Section 516A reporting – Environment Protection and Biodiversity Conservation Act 1999
11	EPBC-Offsets	Commonwealth of Australia, Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy, 2012
12	GBRMP	Great Barrier Reef Marine Park Authority, Guidelines on the use of Hydrodynamic Numerical Modelling for Dredging Projects in the Great Barrier Reef Marine Park, 2012
13	LTMMP	Commonwealth of Australia, Long Term Monitoring and Management Plan Requirements for 10 year Permits to Dump Maintenance Dredge Material at Sea, 2012
14	MSFD-GES	Van der Graaf et al, European Marine Strategy Framework Directive - Good Environmental Status: Report of the Technical Subgroup on Underwater noise and other forms of energy, 2012
15	MSFD	Marine Strategy Framework Directive Technical Subgroup on Underwater Noise, Monitoring Guidance for Underwater Noise in European Seas - Monitoring Guidance Specifications 2nd Report, 2013
16	NAGO	Commonwealth of Australia, National Assessment Guidelines for Dredging, 2009
17	PIANC-8	PIANC EnvCom WG Report no 8, Biological assessment guidance for dredged material, 2006
18	PIANC-108	PIANC EnvCom WG Report No. 108, Dredging and port construction around coral reefs, 2010
19	PIANC-100	PIANC EnvCom WG Report No. 100, Dredging Management Practices for the Environment. A Structured Selection Approach, 2009
20	PIANC-10	PIANC EnvCom WG Report No. 10, Environmental Risk Assessment of Dredging and Disposal Operations, 2006
21	SDA	Commonwealth Environment Protection (Sea Dumping) Act 1981 (the Sea Dumping Act)
22	Simpson	Simpson SL and Batley GB, Sediment quality assessment: a practical guide, 2016
23	USEPA	U.S. Environmental Protection Agency and U.S. Army Corps of Engineers (USEPA/USACE), Evaluating Environmental Effects of Dredged Material Management Alternatives - A Technical Framework, EPA842-B-92-008, 2004
24	USACE	Palermo et al, Technical Guidelines for Environmental Dredging of Contaminated Sediments, U.S. Army Corps of Engineers, ERDC/EL TR-08-29, 2008

Environmental Impact Assessment (EIA)			
EIA / Baseline monitoring	GBRMP	Guidelines on hydrodynamic modelling and baseline data requirements	Modelling will be part of the EIA. Possibly applicable because set in a sensitive marine environment where conservation is important (Great Barrier Reef).
EIA / Offsets	EPBC-Offsets	Offsets are defined as measures that compensate for the residual adverse impacts of an action on the environment. Where appropriate, offsets are considered during the assessment phase of an environmental impact assessment	Could be adopted in an ISA offset policy. Offsets are to be funded by the Proponent.
There are several country/region - specific guidelines available for the preparation of an EIA, largely similar in content. Guidelines outline the Terms of Reference required by the Regulator. A risk assessment is an important part and to be included in the EIA. To review if necessary.			
Environmental Management Plan (EMP)			
EMP	EMP	Guidelines on the preparation, content and risk rating of an Environmental Management Plan	
An EMP would include one or more monitoring plans. Guidelines of monitoring methods are available; the type of monitoring / parameters to monitor need to be established first. The actual monitoring plans will be project-specific, and will relate to the definition of thresholds and criteria (defined in assessment framework and based on local ecosystem). To review if necessary.			
Mitigation measures / Controls / Environmental Management			
In the dredging industry, a whole range of environmental management controls are adopted as best practice; involving timing, operational and technical (equipment) measures. Only those that could be applicable are mentioned here. Recently, WAMSI undertook research on plumes generated by dredgers and a number of reports have been published.			
Water quality - turbidity control	PIANC-100, USACE 8	Dredging: Reduce production rate at which material is removed from seafloor. Limit speed of cutter head.	Slower rates lengthen the time the dredger operates, so other impacts may be prolonged.
	NAGO 4.4, BPEM 3.4, PIANC-100, PIANC-108	Dredging & disposal: Dredging windows. Changes to dredging in response to site conditions taking into account tides, wind, currents, natural / elevated turbidity levels. Schedule dredging / disposal to avoid sensitive timings and critical timings of an organism's reproduction cycle (coral spawning, turtle nesting). Operational techniques: Control overflow. The use of specialised equipment to minimise generation of turbidity (green valve reduces air entrainment in overflow). Feedback monitoring to alter operations when required. Design robust monitoring program than can inform management (enable adaptive management). Avoid and mitigate impacts to sensitive receivers. Monitoring is generally a condition of approval.	Change location; can reduce impact (less sedimentation) at a certain location but may increase total zone of influence. Identify local environmental values and critical timings. Control & schedule discharge according to hydrodynamic conditions. Design nodule collector head in such a way turbidity generation is minimised. PIANC-108 could be applicable mainly because coral reefs are a sensitive environment and are particularly sensitive to water quality degradation, turbidity and sedimentation.
	PIANC-100, USEPA 4.4	Disposal: Site selection / location is key. Dispersive or retentive site will define acceptable impacts in terms of extent. Spread material evenly on seafloor. Submerged discharge; diffuser. Thin layer placement (<30cm) to allow for burrowing organisms to recover. May increase zone of influence. In US: pre-select disposal site and develop management plan for site.	Discharge as close to the seafloor as possible or at the depth hydrodynamic modelling proves turbidity plumes will be minimal (below upwelling zone, consider salinity, temperature, density currents)
Water quality - nutrients	BPEM 3.4	Release of nutrients to be considered for large dredging projects.	Relevant? Will nutrients be added in the system; will different nutrient levels be introduced at different depths?
Marine mega fauna	PIANC-100	Management measures: timing of dredging operations (whale migration; avoid collision, avoid noise interference); equipment modifications (turtle deflection, acoustic deterrent), operational (dredge pump not operating while not on seafloor).	Whales present? Determine lifecycle of deepsea fish.
Marine pests / invasive species	NAGD App E	Provides information, refers to other sources.	Invasive species at surface can be introduced by ballast water. Mining activity relevant: Could species from the seafloor be introduced at the discharge point, travel in the plume with currents and colonise areas away from their original habitat? Could any species survive the transport to the surface and then back to depth?
	CRIMP	Guidelines on surveys, sampling protocols, specimen handling.	Applicable when introduced species monitoring is relevant
IMO Guidelines: Management of ballast water and control of biofouling. To review if relevant.			
Underwater sound	CEDA	Recommends risk-based approach. "The American National Standards Institute's ANSI-ASA S12.64/2009-Part 1 Report for measuring radiated sound of (transiting) ships in deep water formed the basis for the development of the international ISO Publicly Available Specification 17208-1:2012 'Acoustics – Quantities and procedures for description and measurement of underwater sound from ships – Part 1: General requirements for measurements in deep water'. ISO working groups are developing (or have been developed by now) international measurement standards for ships in deep water.	
	CEDA	Exposure assessment to aquatic life. "Until measurement standards become available, the approach followed in recent studies in the Netherlands (de Jong et al. 2010) and the UK (Robinson et al. 2011, Wang et al. 2013) can provide guidance for measuring the radiated sound of dredgers. These approaches will be proposed for the future international standard development, which are urgently required to arrive at an internationally accepted protocol for risk assessment. Underwater radiated sound measurements of dredgers require the use of hydrophones, deployed from a quiet vessel or from a buoy, or mounted on the seabed at a minimal distance of about one ship length from the dredger. Data from acoustic measurements at a fixed position while the dredger passes the hydrophones, or at a number of measurement positions at various distances from a stationary dredger, are required to obtain an assessment of the source level of the dredger. Positions of the hydrophones relative to the dredger need to be monitored, e.g. by means of GPS. These arrangements can be adapted to other types of dredgers."	
	EPBC 2.1	Developed for the Oil & Gas Industry. Focus on seismic exploration. Marine mammal observation (MMO) guidelines	Applicable when whales are expected to occur in the area.
	EPBC 2.1b	Focus on seismic exploration: refers to Southall, et al (2007). "Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations."	Applicable when whales are expected to occur in the area. Applicable to exploration rather than exploitation.
	MSFD-GES	European Guidelines. To review if relevant; underwater sound	
	MSFD	European Guidelines. To review if relevant; monitoring guidance underwater sound.	Ambient noise data from north-east Pacific included.
General environmental protocols & standards			
Environmental sampling	NAGD App D & H, BPEM App 3	Sample handling, storage, preservation, labelling	General environmental sampling protocols are applicable. Additional measures to the deep sea environment would be necessary, due to for example the remote location, high pressure.
	NAGD App F	Field and laboratory quality control and measures	General field and laboratory QA/QC protocols are applicable. Specific tests can require additional requirements and specialised laboratories.
Sampling (sediments)	NAGD App D, BPEM App 3	Guidelines on sampling methods, type of samplers, sub-sampling, sample handling for mostly chemical analyses.	More relevant to exploration. DSM-specific information available, such as Sterk (2015).
Environmental performance indicators			
Environmental performance indicators of the Proponent	LTMMP	Environmental performance indicators related to monitoring outcomes. For example, No injury or mortality incidents of marine mammals. 100% compliance with all requirements relating to the management of invasive species. Zero incidents involving the loss of solid and hazardous waste into the marine environment.	Reporting requirements for proponent /contractor
	USACE 4	Performance standards may include applicable water quality standards, limitations on resuspension. Goals and objectives of the project may be initially defined in the feasibility phase in general terms, and then be refined and finalized in more specific terms in the detailed design phase.	
Reporting	SDA	Describes reporting requirements.	ISA could require reporting sheets to be filled in by the contractor by a certain time each year and publish the reports online.
Environmental performance indicators of the Regulator	EPBC-Reporting	A suggested reporting template and indicators are provided with a number of indicators based on three environmental themes: (1) energy efficiency, (2) waste; and (3) water.	Internal working structure



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- International/General

United Nations Conventions	
Statutory Instrument	Objectives
International Convention for the Prevention of Pollution from Ships 1973 (MARPOL Convention)	Requires member states to minimise the risk of marine pollution from ships
United Nations Convention on the Law of the Sea 1994 (UNCLOS Convention)	Multilateral agreement on the law of the sea that allows countries to exploit their own resources under an internationally agreed framework that establishes guidelines for businesses, the environment, and the management of marine natural resources
United Nations Framework Convention on Climate Change 1997 (Kyoto Protocol)	Has, as its objective, the reduction of negative changes to the earth's climate, with a focus on greenhouse gases. Places onus on industrialised countries to reduce emissions. Economically developing countries are exempt from the reduction requirements
The Vienna Convention for the Protection of the Ozone Layer 1993	Protection of the ozone layer
Convention on Biological Diversity 1993 (Biodiversity Convention)	Preserving and sustaining biological diversity
Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	Protection of human health and the environment against the adverse effects of hazardous wastes.

Equator Principles	
IFC Guideline	Description
<i>IFCs Policy and Performance Standards on Environmental and Social Sustainability (IFC, 2006a, as updated – January 1, 2012)</i>	Standards developed to manage social and environmental risks and impacts in the private sector of countries eligible for financing
<i>IFCs Guidance Notes: Performance Standards on Social and Environmental Sustainability (IFC, 2006b)</i>	A technical reference that supports the implementation of the IFC Performance Standards
<i>IFC Environmental, Health and Safety General Guidelines (IFC 2007a)</i>	A technical reference that provides guidance on common environmental, health and safety issues potentially applicable to all industry sectors
<i>IFC Environmental, Health and Safety Guidelines for Mining (IFC 2007b)</i>	A technical reference that provides guidance on environmental, health and safety issues potentially applicable to mining projects
<i>IFC Environmental, Health and Safety Guidelines for Offshore Oil and Gas Development (IFC, 2007c)</i>	A technical reference that provides guidance on environmental, health and safety issues potentially applicable to offshore oil and gas projects
<i>IFC Environmental, Health and Safety Guidelines for Shipping (IFC, 2007d)</i>	A technical reference that provides guidance on environmental, health and safety issues potentially applicable to the operation and maintenance of ships used for the transport of bulk cargo and goods

Air Quality and Dust Management	
Convention/Guideline	Description
<i>International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), Annex VI Air</i>	Sets regulations for the prevention of air pollution from atmospheric emissions associated with engine exhausts and other on-board sources.
<i>The Australian National Environmental Protection Measure for Ambient Air Quality (EPHC/NEPC, 1998)</i>	Provides guideline criteria for SO ₂ , NO _x , and particulate matter
<i>Methods and Guidance for Modelling and Assessment of Air Pollutants in NSW (NSW EPA, 2001)</i>	Provides guidance relating to particulate matter and nuisance fugitive emissions (e.g., dust)
<i>World Bank Group Pollution Prevention and Abatement Handbook - Ground-level Ozone (WBG, 1998a)</i>	Provides guidance relating to ground-level ozone
<i>World Bank Group Pollution Prevention and Abatement Handbook - Nitrogen Oxides (WBG, 1998b)</i>	Provides guidelines for NO _x emissions
<i>World Bank Group Pollution Prevention and Abatement Handbook - Sulphur Oxides (WBG, 1998c)</i>	Provides guidelines for SO _x emissions
<i>IFC Performance Standard 3: Pollution Prevention and Abatement</i>	Provides for avoiding or minimising pollution from Project activities, including promoting the reduction of emissions that contribute to climate change.
<i>IFC EHS General Guidelines</i>	Incorporate the World Health Organisation ambient air quality guidelines (1987, 1999, 2006)
<i>United Nations Framework Convention on Climate Change 1997 (Kyoto Protocol)</i>	Aims to reduce negative changes to the earth's climate, with a particular focus on greenhouse gases.

Benthic Ecology	
Convention/Guideline	Description
<i>ISA Technical Study No 10. Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals, 2011.</i>	Prescribes requirement to describe substrate and sediment composition, sedimentation rates and impacts caused by the mining such as sediment plume generation on the seabed.
<i>International Marine Minerals Society (IMMS) Code for Environmental Management of Marine Mining, 2011.</i>	Comprises Environmental Principles for marine mining and a set of Operating Guidelines for application as appropriate at specific mining sites.
<i>IFC Performance Standard 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources</i>	Prescribes guidelines for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources.
<i>Guidelines for the Conduct of Benthic Studies at Marine Aggregate Extraction Sites</i>	Outlines guidelines for conducting benthic studies

Noise	
Convention/Guideline	Description
<i>Australian Standard AS 1055 'Description and Measurement of Environmental Noise'</i>	Sets out general procedures for the description and measurement of environmental noise including repetitive impulsive noise. The Standard defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.
<i>New South Wales Industrial Noise Policy</i>	Aims to balance the need for industrial activity with the desire for quiet in the community.
<i>IFC Performance Standard 1: Social and Environmental Assessment and Management System</i>	Establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring, and reporting.
<i>IFC Performance Standard 3: Pollution Prevention and Abatement</i>	To avoid or minimise adverse impacts to human health and the environment by avoiding or minimising pollution [including noise] from Project activities.
<i>IFC EHS General Guidelines (April 2007)</i>	Incorporates the World Health Organisation guidelines for community noise (1999)
<i>Department of the Environment and Heritage, Commonwealth Government of Australia. Guidelines on the application of the Environment Protection and Biodiversity Conservation Act to interactions between offshore seismic operations and larger cetaceans (2001)</i>	Relate to threshold isopleths at which 'acoustic damage' or 'acoustic disturbance' effects on sensitive marine mammals (e.g., large baleen whales) are known and based on marine seismic survey noise research and impact assessments

Emergency Response and Spill Contingency Management	
Convention / Guideline	Objectives
<i>International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78)</i>	Sets regulations for the prevention of pollution from oily water, sewage, noxious liquids, garbage and atmospheric emissions from vessels.
<i>The Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREG).</i>	This convention gives recognition to traffic separation schemes with a series of steering and sailing rules on conduct of vessels operating in or near traffic separation schemes, in conditions of varying visible contact
<i>The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 (STCW);</i>	The 1978 STCW Convention was the first to establish basic requirements on training, certification and watchkeeping for seafarers on an international level.

Sediment	
Convention / Guideline	Description
<i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)</i>	Provides criteria for assessing sediment quality including provisions for the allocation of site specific criteria where relevant.
<i>IFC Performance Standard 1: Social and Environmental Assessment and Management System</i>	Establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring, and reporting.
<i>IFC Performance Standard 3: Pollution Prevention and Abatement</i>	To avoid or minimise adverse impacts to human health and the environment by avoiding or minimising pollution from Project activities.
<i>IFC EHS General Guidelines</i>	Describes provisions in relation to wastewater management and water monitoring and management
<i>International Marine Minerals Society (IMMS) Code for Environmental Management of Marine Mining</i>	Comprises Environmental Principles for marine mining and a set of Operating Guidelines for application as appropriate at specific mining sites.

Introduced Species Management	
Convention	Objectives
<i>International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004</i>	Requires vessels to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan, and requires all ships to carry a ballast water record book and an international ballast water management certificate.
<i>IMO Resolution MEPC.207(62) - 2011 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species</i>	Requires interested parties to adopt measures to minimize the risk of introducing invasive aquatic species via biofouling, and reporting to the Marine Environment Protection Committee on any experience gained in their implementation.
<i>International Convention on the Control of Harmful Anti-fouling Systems on Ships (International Maritime Organisation) (2008).</i>	Prohibits the use of harmful organotins in anti-fouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.
<i>United Nations Convention of the Law of the Sea (UNCLOS)</i>	Provides for the protection and preservation of the marine environment.
<i>Convention on Biological Diversity 1993 (Biodiversity Convention)</i>	Control or eradicate those alien species which threaten ecosystems, habitats or species

Waste Management	
Convention / Guideline	Objectives
<i>Australian Standard AS 2243.10</i>	Outlines standards for safe storage of chemicals and hazardous materials in laboratory conditions.
<i>Australian Standard AS 2508</i>	Outlines standards for safe storage and handling of hazardous materials.
<i>International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), for disposal of oil (Annex I), noxious liquid substances in bulk (Annex II), pollution by harmful substances in packaged form (Annex III), sewage (Annex IV), garbage (Annex V).</i>	Sets regulations for the prevention of pollution from oily water/sewage and garbage from vessels.
<i>Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)</i>	Protection of human health and the environment against the adverse effects of hazardous wastes.
<i>International Finance Corporation Environmental Health and Safety Guidelines for Mining</i>	Provides performance levels and measures expected to be achieved for mining and concentrating of raw materials, including marine dredging. In the absence of a deep sea mining guideline, these guidelines are applied.
<i>International Finance Corporation General Environmental Health and Safety Guidelines 2007</i>	Provide performance levels and measures expected to be achieved for a variety of industries, and provide both general and industry-specific performance levels.

Lighting Management	
Convention / Guideline	Description
<i>International Maritime Organisation Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG)</i>	Parts C and D cover lighting requirements for powered vessels underway and with restricted movement
<i>ISA Technical Study No 10. Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals, 2011.</i>	To consider the effect of light (<i>inter alia</i>) from the mining operation on environmental components on the surface, midwater and seabed biological environment
<i>IFC Environmental, Health and Safety (EHS) Guidelines 2.1 General Facility Design and Operations</i>	Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' maybe required where specific visual activity requirements should be met
<i>IFC Environmental, Health and Safety (EHS) Guidelines 2.3 Physical Hazards</i>	Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed
<i>Laser safety thresholds for cetaceans and pinnipeds, 1998</i>	Shows that human eyes are more sensitive than cetacean and pinniped eyes and that laser energies safe for human eyes will also be safe for marine mammals. Higher energy laser densities may be appropriate if illumination of humans is avoided

Environmental Monitoring	
Convention / Guideline	Description
<i>International Finance Corporation General EHS Guidelines</i>	Provides guidelines for the management of environmental, health and safety issues, including monitoring, for general industry use.
<i>ISA Technical Study No 10. Environmental Management Needs for Exploration and Exploitation of Deep Sea Minerals, 2011.</i>	Prescribes requirement to describe substrate and sediment composition, sedimentation rates and impacts caused by the mining such as sediment plume generation on the seabed.
<i>Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. Department of Environment and Conservation: Sydney</i>	Provide guidelines for daily dust deposition rate and measurement.

Water Management	
Convention / Guideline	Description
<i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000)</i>	Criteria for assessing water quality including provisions for the allocation of site specific criteria where relevant
<i>IFC Performance Standard 1: Social and Environmental Assessment and Management System</i>	Establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring, and reporting.
<i>IFC Performance Standard 3: Pollution Prevention and Abatement</i>	To avoid or minimise adverse impacts to human health and the environment by avoiding or minimising pollution from Project activities.
<i>IFC EHS General Guidelines</i>	Describes provisions in relation to wastewater management and water monitoring and management
<i>International Marine Minerals Society (IMMS) Code for Environmental Management of Marine Mining</i>	Comprises Environmental Principles for marine mining and a set of Operating Guidelines for application as appropriate at specific mining sites.

Marine Mammal / Animal Management	
Convention / Guideline	Objectives
<i>JNCC Guidelines for Minimising the Risk of Injury and Disturbance to Marine Mammals from Seismic Surveys 2010</i>	Internationally recognised guidance on minimising impacts to marine mammals due to noise
<i>Australian Government EPBC Act Policy Statement 2.1 - Interaction between Offshore Seismic Exploration and Whales 2007</i>	Internationally recognised guidelines and threshold criteria for underwater noise (received) levels relevant to marine mammals.
<i>IFC Performance Standard 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources 2007</i>	Provides guidance for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources.



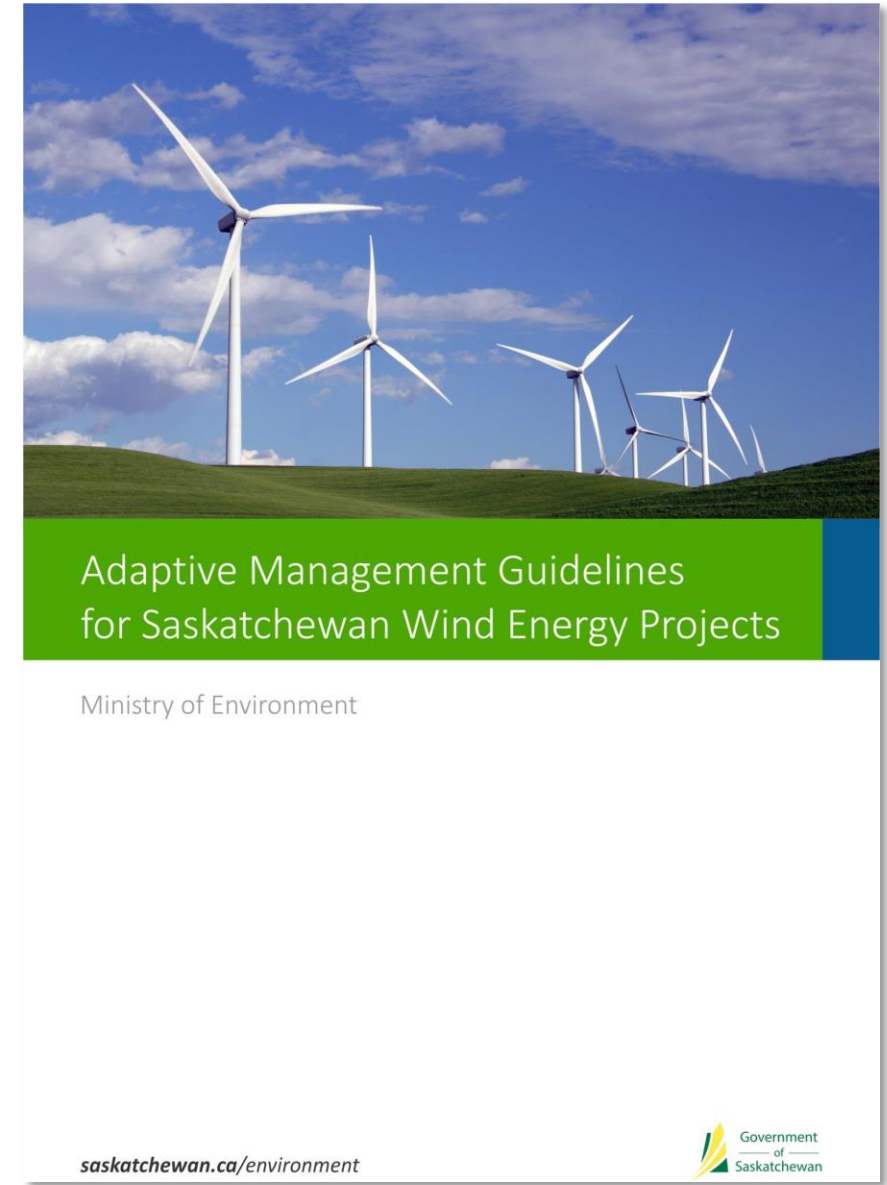
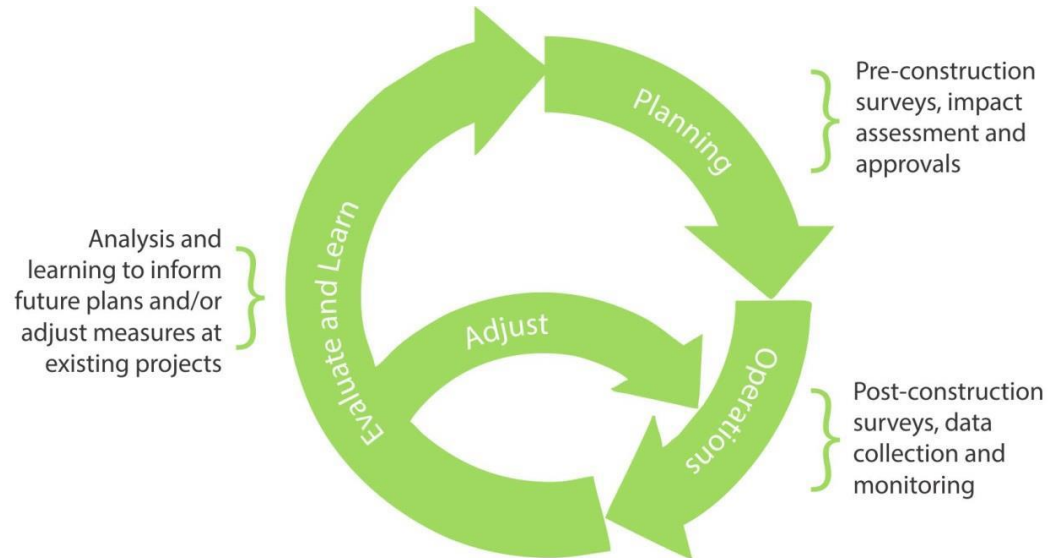
What about the gaps?

- Need to consider **when** we need the standard or guideline
- Consider: does a standard or guideline **change** what will happen for the better?
- Need to consider when we will have the **knowledge** required to put reasonable standards and guidelines in place



Challenges

- The industry doesn't yet exist
 - Adaptive Management is going to be important (47)





Remember the goals, objectives
and principles

- **Responsible management** of the resources of the Area
- **Effective protection** of the marine environment
 - What does this look like? (e.g. 30% of the CCZ remains untouched by mining)
 - How is this achieved? (e.g. set aside areas)





Approaches: Ideas

Serious Harm

- What constitutes serious harm?
- “Legal definition, not a scientific one”
- “It’s difficult to have a fixed definition”
- Links back to needing to define the over-arching goals, objectives and principles (ISA) → Contractor demonstrates how these will be met through the EIA → EIS, EMMP, Closure Plans
→ regulator to approve or not



Approaches: Ideas

Thresholds

- In some cases, we can draw from existing thresholds
- Where thresholds are difficult to define, might it be better to set the general rules now and refine as we **do** and **learn** more?

- Turbidity Thresholds
- Contaminant Thresholds
- Sedimentation (cold corals)
 - <10 mm – DNV-GL
 - <6.5 mm – Atlantic (Ken)
- Noise
- Temperature

Example general rule:
sediment plumes must not
impact set-aside areas



Approaches: Ideas

What's too prescriptive?

- Contractors must use “internationally recognized” standards – YES
- Particular standard – allow flexibility (e.g. regional)



Approaches: Ideas

- Partnerships, engagement
- Common goals → solutions

